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

POLISHED STAINLESS STEEL

<table>
<thead>
<tr>
<th>Frame</th>
<th>Aquariums</th>
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</thead>
<tbody>
<tr>
<td>24 x 15 x 12</td>
<td>£ 7 7 0</td>
</tr>
<tr>
<td>30 x 15 x 12</td>
<td>£ 8 8 0</td>
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<tr>
<td>36 x 15 x 12</td>
<td>£ 10 10 0</td>
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<tr>
<td>48 x 15 x 12</td>
<td>£13 13 0</td>
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</tbody>
</table>

DISTRIBUTOR OF

- McLYNN'S FISH FOOD
- ES-SS PRODUCTS
- ELECTRICAL AND GENERAL
- WATER LIFE, AQUARIST, DITCHFIELD'S AND T.F.H. BOOKLETS
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Angle Iron Aquariums, Frames and Stands a speciality. Cold sizes made to order, painted any colour, guaranteed square and free from welds. Stove enameled Corner Bowls, Bow Fronts and Wrought Iron Units. Half Carriage Paid on these items.

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Effective — Colourless — Does not harm the plants

Before Treatment

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These photographs were taken by Professor Dr. A. Stolk of Amsterdam University, and show the remarkable effect of LIQUITOX.

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The product is in liquid form to ensure the correct particle size and to give rapid dispersion throughout the tank with minimum disturbance to the delicate fry.

Liquifry No. 1 for fry or Egglayers

Price 2/-d.

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Start your baby fish on Liquifry and watch them grow!

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18 Church Street - Dorking - Surrey

Tel. Dorking 2566

August, 1965
**TROPICAL FISH**

**LIVEBEARERS**

- **Guppies**
  - Golden... 6/ each
  - One... 7/ each
  - Half Black... 10/ each
  - Fancy... 6/ each
  - Las... 6/ each

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  - Red Telescope... 3/6 each
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  - Albino... 3/ each
  - Red Wagtail... 3/6 each
  - Red Eye Red... 4/ each
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  - Victory... 3/ each
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  - Bluish Gold... 2/6 each
  - Bluish Variety... 6/6 each
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  - Varieg... 2/ each

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  - Green Livebearer... 4/ each
  - Black Neon... 2/ each
  - Blue... 2/ each
  - Black Star... 10/ each
  - Liberty... 4/ each
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  - Green Velvet... 6/ each
  - Red Velvet... 5/ each
  - Half Black... 2/ each
  - Half Blue... 3/ each

**CHARACINS**

- **Tetras**
  - Gold... 3/ each
  - Neons... 3/ each
  - Neon Rainbow... 3/ each
  - Red Fin... 2/ each
  - Rummy Nose... 2/ each
  - Neon Rainbow... 2/ each
  - Red Eye... 3/ each
  - Black Line... 3/ each
  - Serpae... 4/ each
  - Rainbow... 4/ each
  - Rainbow... 4/ each
  - Black Widow... 5/ each
  - Beltsa Flies... 3/ each

**PANCHAX GROUP**

- **Panchax**
  - Rio... 4/ each
  - Line... 1/6 each
  - Panchax Whit... 1/8 each
  - Gourami... 1/8 each

**APOPTERIGA**

- **Corydoras**
  - Yellow... 6/ each
  - Green... 5/ each
  - Purple... 6/ each
  - Green... 5/ each
  - Gold... 6/ each
  - Yellow... 5/ each
  - Purple... 6/ each
  - Green... 5/ each

**CATFISH & LOACHES**

- **Bristlenose**
  - One... 5/ each
  - Two... 10/ each
  - Three... 15/ each
  - Four... 20/ each

**ICY**

- **Beebe’s Loach**
  - One... 6/ each

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  - One... 7/ each
  - Two... 14/ each

**SMALL**

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  - One... 5/ each
  - Two... 10/ each

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- **Goldfish**
  - One... 2/ each
  - Two... 3/ each

**LYRIOPTERUS**

- **Lyriopter**
  - One... 2/ each
  - Two... 3/ each

**PHERNIUM**

- **Pherium**
  - One... 3/ each
  - Two... 5/ each

**MISCELLANEOUS**

- **Other Fish**
  - One... 2/ each
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---

*All fish guaranteed to be in good condition and shipped free of charge. 7/6 rail and packing charge to be included with every order. All consignments of fish to be collected from nearest main-line railway station.*

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DIVER... £2 5, HIPPOKOTAMUS... £1
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A LARGE SELECTION OF FRENCH CERAMIC ORNAMENTAL DIFFUSERS ALSO IN STOCK

WE HOLD IN STOCK A LARGE VARIETY OF LIVESTOCK, CHARACINS, KABE, SNAKES, OCHLIDES, CATFISH, LOACHES, TETRA, BUDDER FISH AND MANY RARE FISHES

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SWIRLAWAY BATTERY POWERED... £17 10
WINDMILL AIR REJECTOR... £10 0
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NEW GRO-WEL BUBBLE UP AQUARIUM FILTER
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Aquarium Finisher
24 x 12 x 12"... £13 0
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14 x 10 x 8"... £7 0
12 x 10 x 6"... £5 0
UNLESS OTHERWISE STATED PLEASE ADD POSTAGE ON ALL GOODS UP TO 10/-. 1/6d.; 20/- 2/-. 30/- 2/6d.

August, 1965
TetraMin

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for your baby fish

L Green Label
for Livebearer Fry
2/6 per pack

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for Egglayer Fry
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Prepared by experts in aquarium fish nutrition
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YOU WANT THE BEST! WE HAVE IT!

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SPECIAL FISH THIS MONTH

8" ELECTRIC CATS 30- each
ADULT CARDINAL TETRA 7/6 each
BABY RED TAIL SHARKS 2/6 each

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NEW ARRIVALS
Golden Orfe 4 5/ 8" 2"- 6/" each
Goldfish 4/" to 7/" each
Tetra 5/" to 7/" each
Large Goldfish 7 1/"- 9/" each
Small Orfe 2/" each
Goldfish & Show Fish 1/"- 3/" each
ALL FISH PLANTS STOCKED

THERMOSTATS
Proctor... 36/”
Consort External... 53/”
Consort New External Type... 25/”
Winky External... 25/”
Inter-Pet... 25/”
UNO... 32/”
Ontario... 36/”
Inter-Ind... 18/”
"Popular" with twin indicator... 24/”
Winky... 18/”- 24/”

AERATORS
Trix... 39/”- 59/”
Soda... 39/”
Red... 48/”
Marine Master... 2 1/2/”
Opaline 3/” each
Proctor... 21/”
Medley Mix 1 A C D... 25/”
Dynes... 12/”

GARDEN PUMPS
Owen... 25/”
Stokes... 25/”

PISTON PUMPS
Hyde Junior New Super... 18/”
Hyde 18/”... 24/”
Hyde 18/”... 39/”

BOOK CASE BOW-FRONTED AQUARIUM
48 x 12 x 15... x 35 10 8
36 x 12 x 15... x 35 10 8
Standard New £27. 45. 8

PLANTS
Aqualog... 64/”
Yellow... 64/”
Vinca... 64/”
Ambia... 64/”
Nelson... 64/”
Hypo... 64/”
Cress... 64/”
Water... 64/”
Glass... 64/”

By post add 1/6d. Minimum 15/6.

HEATERS 25w to 200w
Inter-Pet... 10/”
Uni & Wizard... 10/”

ARMS
"Swing-Away"
Aquarium Vaccines Center
Super Model...

ADULT RARE FISHES
Pomacentridae Kobus... 7/" & 8/" each
Elephant Nose Fish... 3 1/2/”- 3 1/2/” each
Gizzard Latch... 4/”
Knife Fish Nigerian... 7/"- 7/" each
Gold Cardinal... 5/" each
Scares from... 3/” to 3/”
Amphibian Cat... 2 1/2/”- 3/”
Rumours Angelfish... 3/”- 3/” each
Snakehead 2 1/”- 3/” each
Tetramorium... 2/”- 3/”
Red Tail Guppy... 1/”- 1/” each
Gold Tail Shiner 6 1/"- 10/” each
Sumatra Fish... 3/”- 8/” each

Our minimum order for fish is £3. A charge of 15/” is made for sending, carriage charges, by first class post and insurance against transit and damage. Give plant number if possible.

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12 x 12 x 12... x 25 10 8
12 x 12 x 18... x 25 10 8
18 x 10 x 15... x 35 10 8
36 x 12 x 18... x 35 10 8
48 x 12 x 15... x 35 10 8

COVERS
Sides... 10/”...
Sides... 12/”...
Sides... 14/”...
Sides... 15/”...
Sides... 18/”...

Aquarium covers sent by post only at carrier's risk.

FOODS
Easter Plakes... 1/”
Quinn Plakes... 1/”
Brood... 1/”
Age... 1/”
Jolly Dophin... 1/”
Legum... 1/”
Hy... 1/”
Babas... 1/”
Lynn... 1/”
Cousens... 1/”
God... 1/”

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Situated on the A1, Hendon Central Station
391 HENDON WAY, HENDON CENTRAL, N.W.4 Phone: HEN 9700
OPEN 8.00 a.m.-7.00 p.m. Sundays, 9 a.m.-1 p.m. Emergency Phone: HEN 9700

August, 1965
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UNDER NEW OWNERSHIP
26 WESTBURY LANE, BUCKHURST HILL, ESSEX Tel BUC 4708
for a wide selection of good quality fish and plants
Open every day 10 a.m. to 6 p.m. including Bank Holidays

PLANTS IN STOCK

<table>
<thead>
<tr>
<th>Plant</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aponogeton crispin</td>
<td>3/-</td>
</tr>
<tr>
<td>Aponogeton Undulatum</td>
<td>2/6</td>
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<tr>
<td>Aponogeton Uvulaceous</td>
<td>3/6</td>
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<tr>
<td>Amazon Chain Sword</td>
<td>2/-</td>
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<tr>
<td>Bacopa</td>
<td>6d.</td>
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<tr>
<td>Cabomba</td>
<td>6d.</td>
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<tr>
<td>Ceratophyllum</td>
<td>4d.</td>
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<tr>
<td>Ludwigia</td>
<td>6d.</td>
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<tr>
<td>Myriophyllum</td>
<td>6d.</td>
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<tr>
<td>Cape Pear Spatterdock</td>
<td>6/6</td>
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<tr>
<td>Sagittaria Natans</td>
<td>6d.</td>
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<tr>
<td>Sagittaria Gigantea</td>
<td>2/-</td>
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<tr>
<td>Sagittaria Microsperma</td>
<td>4d.</td>
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<tr>
<td>Indian Fern</td>
<td>2/-</td>
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<tr>
<td>Elodia Densta</td>
<td>4d.</td>
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<tr>
<td>Hygrophylla</td>
<td>6d.</td>
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<tr>
<td>Twisted Yellis</td>
<td>6d.</td>
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<tr>
<td>Portuguese Yellis</td>
<td>6d.</td>
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<tr>
<td>Wisteria</td>
<td>2/-</td>
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<tr>
<td>Giant Hygrophylla</td>
<td>2/-</td>
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<tr>
<td>Crypta Balansea</td>
<td>3/6</td>
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<tr>
<td>Callista</td>
<td>3/6</td>
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<tr>
<td>Cordata</td>
<td>3/6</td>
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<tr>
<td>Hartellana</td>
<td>2/6</td>
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<tr>
<td>Bananas Plant</td>
<td>4/6</td>
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<tr>
<td>Broad Leaf Sword</td>
<td>5/6</td>
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<tr>
<td>Radicans</td>
<td>10/-</td>
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<tr>
<td>Water Orchid</td>
<td>4/6</td>
</tr>
<tr>
<td>Malay Sword Plant</td>
<td>4/6</td>
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<tr>
<td>Madagascan Lace Plant</td>
<td>17/6</td>
</tr>
</tbody>
</table>

PLANT PARCEL OFFERS
20 plants for 10/- inc. Water Lettuce
40 plants for 20/- inc. Water Lettuce, Cryptocorys, Aponogeton

The now famous N.O.F.F. fish food is also still available at 2/6, 4/-, 6/- and the new breeders pack at 10/-, post free

Please send S.A.E. for price lists
For wholesale plant list. Trade headed paper please

Please address all correspondence as address above

THE AQUARIST
**QUEENSBOROUGH FISHERIES**

See overleaf for further information

**SPECIAL PLANT COLLECTIONS (post only)**

All post enquiries: 111 Goldhawk Road, W.12. 2s. post and packing on all collections

<table>
<thead>
<tr>
<th>TROPICALS</th>
<th>TROPICAL OR COLD</th>
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<tbody>
<tr>
<td><strong>No. 1</strong></td>
<td><strong>No. 17</strong></td>
</tr>
<tr>
<td>50 plants including</td>
<td>Giant Amazon Sword Plant</td>
</tr>
<tr>
<td>Dwarf Lily</td>
<td>6-8 inches</td>
</tr>
<tr>
<td>Cryptocoryne</td>
<td><strong>7/6</strong></td>
</tr>
<tr>
<td>Waterlily</td>
<td></td>
</tr>
<tr>
<td>* £1</td>
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| **No. 3** | **No. 18**       |
| 15 Vallisneria | Water Lettuce |
| 5 Myriophyllum | Very beautiful plant |
| 5 Micro Sagittaria | or 5 for 15/- |
| 5 Ludwigia |                   |
| 6 Elodea Dentata | **2/6**         |
| * £1      |                   |

| **No. 4** | **No. 19**       |
| 1 Nymphaea Caerulea | Water Hyacinth |
| 1 Giant Hygrophila | 6-8 inches Floating Plant |
| 1 Agapanthus | **7/6**         |
| 1 Waterlily |                   |
| 1 Giant Sagittaria |                   |
| 1 Cryptocoryne |                   |
| 1 Indian Fern |                   |
| 1 Portion Hair Grass |               |
| * £1      |                   |

| **No. 5** | **No. 20**       |
| 6 Vallisneria | Spanish Dock |
| 6 Myriophyllum |               |
| 6 Hygrophila |                   |
| 6 Elodea Dentata |               |
| * £1      |                   |

| **No. 6** | **No. 21**       |
| 1 Portion Hair Grass | 10 large bunches of oxygenating plants for your pond |
| 1 Portion Cleaver | **£1**          |
| 1 Portion Sagittaria |                   |
| 1 Baucya |                   |
| * £10/- |                   |

| **No. 14** | **No. 22**       |
| 12 Sagittaria | Selection of oxygenating plants & Marginals |
| 8 Myriophyllum | **£1**          |
| 8 Ludwigia |                   |
| 8 Pinnwurz |                   |
| 8 Hornwort |                   |
| 1 Portion Ricola |               |
| 2 Portion Hair Grass |               |
| * £15/- |                   |

| **No. 19** | **No. 23**       |
| 30 Plants for your Aquarium—Value 50/- |               |
| 10/− |                   |

| **No. 18** | **No. 24**       |
| 6 Vallisneria | Line Daphnia |
| 6 Pinnwurz | Lineantea |
| 6 Elodea Dentata | 1/6          |
| 3 Hornwort | 2/6           |
| 3 Hornwort |                   |
| 3 Portion Hair Grass |               |
| * £10/- |                   |

**FULL CATALOGUE ON APPLICATION S.A.E.**

Mr Rous wishes to express his thanks to the many visitors already received at his new Hatcheries and Watergardens at Wraysbury.

Printed below are some of the gratifying comments.

- A most impressive set up, well worth seeing.  MR. BLANCHARD, CHALFONT ST. PETER
- What a lovely place; it reminds me of Kew Gardens.  MRS. EDWARDS, HIGH WYCOMBE
- Now I have been I shall certainly come again.  MRS. MARSHALL, SLUGH
- It reminds me of a film set.  MR. ALLARD, CHELMSWICK
- I have enjoyed myself so much.  MR. BROWNFIELD, REDHEILL
- What a beautiful place.  MRS. THOMPSON, KINGS LANGLEY
- I have never seen such a collection of plants before.  MR. HALL, LITCHFIELD

Why dont YOU pay us a visit?

Open Sundays and Thursdays 10 a.m. to 4 p.m.

August, 1965
Special News
See Page VII

We are specialists in aquarium installations. All sizes and styles to customers own specifications carried out. We have many designs set up to suit showrooms. Why not call and let us quote.

BOW AQUARIUMS
36in. x 12in. x 11in. best foam lined hooded stand £19/19/- complete.

48in. x 12in. x 12in. £29/19/6

FULLY-GLAZED AQUARIUMS
30 x 12 x 12 £19/19/-
36 x 12 x 12 £29/19/-
30 x 12 x 16 £27/11/6
48 x 12 x 15 £32/1/6

BACKING PAPERS
SEA & SHORE
36 x 12 x 12 £25/19/-

SANDS SHELLS
24in. long x 12in. high 1/-

Silver Fish 2/-

Spectra 3/-

Waterfall 5/-

CARRIAGE EXTRA
Please add 1/- extra postage on all prices over 10/- to 21/- to 30/- to 35/- to 50/- to 60/-

All Postal Enquiries to Goldhawk Road Address

THE AQUARIST
The Chub

by B. Fry

Small chub measuring about 4 in. in length make attractive inmates for a coldwater aquarium or garden pond large enough to accommodate them in comfort. Immature chub are silver and can quite easily be mistaken for young dace. But whereas the anal fin of the chub is convex, that of the dace is concave. An adult chub, however, is as different in appearance from an adult dace as chalk is from cheese. Apart from its bulkier body and larger head, it is bronze in colour, darker above than below, and its large scales are dark based. Further, there is a great difference in size. A mature chub may measure more than 14 in. long and weigh quite a few pounds. A full grown dace seldom attains more than 10 in. in length or much over 1 lb. in weight.

The chub is widespread in Britain, but is absent from Devon, Cornwall, west Wales and northern Scotland. It is widely distributed in central and southern Europe and parts of Asia Minor. In some books its scientific name is given as Squalius cephalus, in others as Leuciscus cephalus.

The species is usually found in clear, slow to fast moving water with a gravelly or sandy bottom. Young chub congregate together and swim in shoals. Old chub tend to lead a solitary existence. The chub is not averse to sunlight, and in fine weather it likes to bask in the warmth it provides at or near the surface. But it is a very keen-eyed, alert and nervous fish (though it likes to be fed by hand). And the slightest noise or passing shadow will send it down to the lower depths. Its favourite hiding places are deep fissures in a clayey bank, or under tangles of willow roots or masses of piled-up debris.

As in most carps, to which family of fishes (the Cyprinidae) it belongs, it eats almost anything, including certain fruit and some greenstuff. Like some humans, it consumes more vegetable matter in the summer and very early autumn than it does in the winter and spring. Then it shows a preference for animal food. Large chub, which become increasingly predatory with advancing age, take great toll of other fishes small enough to be swallowed, and fishes' eggs. Ripe elderberries, cherries, pieces of bread, caterpillars, mealworms, grasshoppers and beetles are among the popular baits used by anglers to catch this fish.

It spawns from April to June, and its 100,000 or more sticky eggs are laid on stones and water plants and hatch out in about a week. After egg-laying is over, it makes...
Propagation of Aquatic Plants

by B. WHITESIDE

As with land plants, aquatic plants multiply or propagate themselves naturally. For the aquarist who wants to increase his stock of plants it is useful to know what the natural methods are. The aquarist can then either encourage the plants to propagate itself or can propagate the plants artificially.

Commonest of all methods of plant reproduction on land is by seed—sexual reproduction. Aquatic plants in their natural habitat usually flower and produce seeds. In the small home aquarium, conditions are far from ideal for plants to flower but some, Cabomba, Vallisneria or Cryptocoryne, often do. A couple of inches of washed gravel is not the ideal medium in which plants will flower. A layer of sterilized loam beneath the gravel, the use of some special fertiliser tablets, or a small flower pot full of soil buried in the gravel are conditions much more conducive to the production of large plants which will flower.

Although raising plants from seed is usually out of the question for the home aquarist, there are a number of other ways in which aquatic plants can be propagated. The most common method is by cuttings. As with land plants, the usual method is to remove a portion of young growth from a mature plant, cut it at the base beneath a node (the place where the lowest leaves emerge), remove the lower leaves for about 3 in. to 1 in, and insert the cutting in the gravel, burying the leaf-free portion. A small stone or a thin strip of lead will hold the cutting in position until it forms adventitious roots. The stone or lead strip can then be removed. A well-lighted position in the aquarium helps the cutting to root quickly. Some of the plants which may thus be propagated are Hygrophila, Elodea, Cabomba, Bucep and Ludwigia.

Many other aquatic plants produce their young cut runners sent out from adult plants. Here one waits until the young plant has rooted and reached a reasonable size, and then it is removed to be transplanted where required. Plants which propagate themselves in this manner should not be planted too deeply in the compost or rotting at the base may result. The root crown, the part of the plant above the roots, should rest just on top of the compost. In this category are Vallisneria, Eichhornia (water hyacinth), Cryptocoryne, Eleocharis (hair grass), Sagittaria (arrowhead), Myriophyllum (hornwort), and Marsilea (four-leaved clover).

Large plants can also be increased by division. Here a mature plant is cut or severed into two or more portions each bearing some roots. These are transplanted as with adult plants. This method can be used with large plants such as Amazon sword.

Indian fern (Ceratopteris thalictroide) is an example of a plant which produces young ones on its larger leaves or fronds. These may be detached and planted when large enough. Young plants often become detached from the parent and float to the surface. Here they produce a host of roots and can be planted or left to float freely, where they provide shade for plants such as Cryptocoryne or provide refuge for fry. Floating plants such as duckweed do not need to be propagated as they soon cover the water surface without any assistance.

Plants like Nymph species can be propagated by cutting the tuber into two pieces but this is a chance business as both pieces often rot in a short time. Leaf cuttings of Hygrophila will often root and form a new plant.

There are some of the main ways in which aquatic plants can be propagated. It is not necessary, of course, to remove runners from adult plants as these will produce a thicker of young plants which gives an established look to an aquarium. As with garden plants, overcrowding produces stunted growth, but if water plants are transplanted from a thicket they will usually grow ahead to a normal mature size.

Although a single plant of, say, Vallisneria costs only about 50c, the cost of stocking a new tank soon mounts up. By helping to increase his present stocks, the aquarist can save money which can be spent on adding a number of fish to his aquaria.

The Chub

continued from preceding page

for shallow, tumbling waters to benefit from their freshening effect. Then, having recovered its strength, it returns to its normal haunts in deeper and less boisterous water.

The chub is not a very tasty fish to eat, for its flesh is insipid. Salted, fried and served with dollops of some popular bottled sauce it would no doubt prove acceptable to a cluster of hungry wolf-cubs entranced by their first day at camp. Sprinkled with salt and freshly ground black pepper, and stuffed with breadcrumbs mixed with herbs such as marjoram or thyme, and then baked and basted with wine vinegar and butter, it makes a reasonably appetising dish—if one has the patience to fiddle with the amazing number of tiny bones. Besides its common name of chub, it is sometimes referred to as the chevin or chevrenner or chevren, from the French word chêf, a head.

The Germans call it the Dickkopf, or thick-head. The appellation chub itself is said, on the authority of the late Tate Regan, to be derived from its well-padded cheeks.

THE AQUARIST
Breeding a colourful Rivulus species:

The Goldtail Rivulus

(Rivulus milesi)

by P. R. STOKES

These splendid fish inhabit the flowing waters, similar to our native brooks, of the Magdalena Basin in Columbia. Their habitat is rich in aquatic vegetation and whilst they swim in the mid or lower layers of the water they are known to leave the water and rest themselves on the floating plants until almost dry before returning.

This type of fish has even been known to travel over land for considerable distances, away from their natural habitat, to be found in the muddy hoofprints of cattle.

The coloration of the male goldtail rivulus is a brilliant lavender blue body, sprinkled throughout with small bright red spots. The belly region from the mouth to the caudal is creamy white. The dorsal, anal and ventral fins are bright orange. The upper and lower edges of the caudal are lined with black and the end is edged a brilliant white. Even the eye at times is seen to glow a bright gold.

The female, although very similar in shape, does not have the exotic colour of the male. The basic body colour is olive green to brown scattered with small dark brown spots. The belly region once again is creamy white and the fins have the same marked appearance of the body. The female also has a dark brown eye spot at the base of the caudal peduncle which is typical of most of the Rivulus species.

My first introduction to these beautiful fish came from a friend in N. Ireland who is also a member of the British Killifish Association, and eggs were sent to me through the post in small plastic bottles. They arrived in 3 days and were in very good condition when I received them. Hundreds of these egg exchanges take place every year between killifish enthusiasts both in this country and abroad.

With the modern air services today eggs can be sent to any part of the world within a few days and it is always a pleasure if not a thrill to receive eggs by this method from such distant places as Rhodesia, South America etc.

The eggs of Rivulus milesi are round and about 1 inch in diameter. I make this observation as some of the tooth-carp eggs are oval. On arrival the eggs were placed in a hard plastic sandwich box containing water of 70 p.p.m. hardness and pH 6.8. Water conditions, as with most Rivulus species, are not critical. The incubation period was stated by my friend to be 12 to 14 days at a temperature of 72°F (22°C). A higher temperature will tend to slow down the incubation period and one is always notified by the sender of eggs of the required water conditions, temperature, incubation period etc.

The tenth day five of the eggs hatched, tail first, which was an amazing thing because I would have thought that the head of the fry, being stronger, would have burst the shell of the egg first.

There were 15 eggs left and by the twentieth day these had not hatched, so something had to be done to release the fry otherwise they would perish in the shells. There are many methods of releasing fry but the method I found to work extremely well was to use an air stone to vibrate the eggs. Within 10 minutes of inserting the diffuser stone all 15 had hatched. During the rather prolonged incubation period all the fry had absorbed their yolk sac and were soon searching for food. On hatching the fry are very large, large enough in fact to take micro worms or brine shrimps as a first food. However, care must be taken when feeding fry in these small hard plastic boxes not to overfeed and pollute the water.

The fry were taken from the incubation box on the fifth day after hatching and transferred to a 24 in. by 12 in. by 12 in. tank for rearing. There is no trouble about rearing so I will not dwell upon it. The young were kept in the rearing aquarium at a temperature in the low seventies (°F), which intensified the colours; they could be sexed quite easily at 4 weeks of age, the rivulus spot showing quite clearly in the females.

A word of warning about Rivulus jumping, especially when frightened. I had a scare once when raising a batch of some fifty young. I happened to knock the tank with
Killiefish in the shelter of some nylon spawning mops, on which eggs are deposited.

chair and all fifty young shot out of the water; luckily the tank had a cover glass and the young were hanging on the sides of the aquarium like rows of sandlimes for at least 10 minutes before they decided all was clear and dropped back into the water!

My first attempt at spawning the Rivulus was when the fish were nearly 2 inches long. I used one male to two females in a tank 12 in. by 8 in. by 8 in., space being limited; no gravel was used, just the spawning medium of nylon mops, some suspended by hooks and a few weighted with lead on the bottom. Six or seven mops were used as Rivulus do eat their eggs. The parents were kept in the spawning tank for several weeks and well fed, and eggs were produced daily. The eggs were removed every 3 days by taking the mops out of the tank, gently squeezing the excess of water from them, and carefully running the thumb and forefinger down a single strand a time. The eggs are quite hard to the touch and amber in colour. These were placed in plastic sandwich boxes for incubating as were the first batch. Hard plastic boxes only must be used as some of the soft plastic ones have a harmful effect on the eggs. The lids of the boxes must be kept on at all times to eliminate evaporation and stop cold drafts from crossing the surface.

This has proved a simple and straightforward method for reproducing a remarkable family of fish which will bring joy and satisfaction to the beginner and experienced aquarist alike. You are well advised to try them for yourselves.

British Killiefish Association

The British Killiefish Association can introduce you to the fascinating new world of fishkeeping in the following ways.

A Monthly News Letter enables B.K.A. members to keep in constant touch with each other by views and ideas, items of interest, and answering queries pertaining to the hobby. A full list of B.K.A. members, addresses and membership numbers is provided and new members' names and relevant data are circulated via the News Letters. Also provided is a Killiefish Egg List, a pamphlet that can be used entirely free, by any B.K.A. member to advertise their requirements, be they eggs or fish, for sale or wanted.

A Half-Yearly Booklet will be published containing articles by leading killiefish breeders, on techniques, new ideas and a host of information regarding breeding procedures, simple breeding, classification etc.

Periodically, pamphlets are published dealing with the propagation, care and feeding of fry and adults. Many of the killiefish species, tooth-carpas as they are sometimes called, are beginners' fish and need no greater care than ordinary tropical fish whilst others will provide an unequalled challenge to breeders, thus giving added interest to novice and experienced aquarists alike.

As the killies are a family of fishes whose eggs can be sent by post to any part of the country, or world, for that matter, the methods of sending and incubating eggs is fully covered by other B.K.A. leaflets.

B.K.A. members live great distances apart and therefore all the activities are dealt with through the post. However, meetings are held at least twice yearly, where killie fanatics can meet and converse. Shows are to be held and lectures arranged. Yearly subscriptions is £1 10s., to include the cost of postage, printing etc. Enquiries, accompanied by a S.A.E., should be addressed to: B.K.A. Secretary, Bill Devison, 2 Shaw Road, Tipper, Staffs.

Centenary Celebrations

THIS year the Quickett Microscopical Club celebrated the centenary of its foundation on 7th July, 1865. The title of the Club commemorates the name of John Thomas Quickett, Professor of Histology and Con- servator of the Hunterian Museum at the Royal College of Surgeons of England. A prominent microscopist in his day, a founder member of the Microscopical Society of London (now the Royal Microscopical Society), Fellow of The Royal Society and of The Linnean Society of London, and author of the Practical Treatise on the Microscope. Quickett died in 1861 at the tragically early age of 46, greatly respected by all who knew him. There were at the time several suggestions current for commemorating his name in some permanent way. As events have proved, no more appropriate memorial to him could have come of this desire than the association of his name with this Club, which has met twice monthly for the last hundred years, and today enjoys a worldwide membership. Particularly, the Club's president in this centenary year is Professor George J. Cunningham, M.B.E., who occupies the Chair of Pathology at the Royal College of Surgeons. The principal event to mark this occasion will be a 2-days' celebration meeting and exhibition of microscopy, which will be open to visitors. This will be held at the Central Hall, Westminster, London, S.W.1 on 8th and 9th October. The theme of the meeting will be twofold. First to illustrate the founding and history of the Club, and secondly to present a survey of present-day microscopy and microscopical equipment in science and industry, in addition to its recreational aspects. Demonstrations of films, slides and micro-projection will also be staged throughout the 2 days. Readers of The Aquarist can obtain invitations by writing to the Club at 2-4 Tudor Street, London, E.C.4.

Cacti in the Fish House

When the Mammillaria are in flower it is a good plan to pollinate the flowers with a soft brush. The plants will then produce colourful berries or fruits. Some of these fruits, such as those carried by A. polygona, will remain red and plump for a whole year and greatly enhance the look of the collection. If seeds are required for sowing it is essential to make sure that the seed pod has started to wither before it is gathered, or the seeds will not be ripe and will fail to germinate.
Artificial Sea Water is Best

by D. S. BUNN

During the past 3 years I have been trying to make a study of the effects of artificial sea water on marine life to be found around the Lancashire coast and to do this successfully it has been necessary to keep as many species as possible alive. It was necessary to observe their habits and behaviour in detail. This at first proved to be easier said than done and yet, once the solution was found, it became possible to keep specimens of many species indefinitely with a minimum of attention and with no more difficulty than most freshwater creatures. It did, however, take me more than a year of abortive, expensive experimentation before the answer was found, and this despite my reading every available book on the subject.

It would be tedious if I were to describe each separate theory which was laboriously disproved before the cause of my early failures was discovered but, in view of the fact that I was not able to find a single book to help me out, I am sure that there must be many would-be marine aquarists who have regretfully abandoned the idea because of these difficulties, who will be interested and relieved to hear that many sea-creatures are, after all, perfectly easy to keep alive in the home. I do, however, hasten to point out that my notes refer only to British fishes etc. and not to marine tropicales, with which I have no experience.

My first aquarium was filled with sea water, collected from Morecambe Bay, and a varied assortment of specimens including sea anenomes, shore crabs, sand gobies, a shanny and one or two prawns etc. There was no aeration provided and as a result the shanny died from suffocation and the anenomes closed up and refused to reopen. An aerator was therefore purchased and its at first periodic, and later continuous, pumping immediately livened things up and made everything, particularly the fishes, look much more at ease.

The species I had at that time were, unfortunately, not as interesting or as spectacular as they might have been, for life on the sea, as everyone knows, is more bizarre and striking than anywhere on land or in freshwater and I longed to have something more interesting, such as hermit crabs, with their parasitic or symbiotic anenomes, some of the more beautiful anenomes and a few of the remarkably specialised rock-pool fishes etc.

A hermit crab was soon collected and placed in the aquarium with every confidence that it would thrive as the shore crabs had done. But this was not to be the case and it marked the point where all my troubles began: hermit crabs had attracted me most of all, the books recommended them as being hardy in aquaria and it seemed ridiculous therefore that I should not be able to keep them.

After this, successions of consignments of large hermits from the Marine Biological Association at Plymouth were ordered, but with failure on each occasion for a whole year. The hermits would arrive in a perfectly healthy and active condition but, within a day or so of being placed in my aquarium, they began to show signs of motor inco-ordination and soon, sometimes even overnight, they became quite unable to move about. Strangely, however, they tended not to die but lingered on week after week, even taking food when it was offered to them, they would even melt successfully in this dejected state.

It was difficult to imagine that the sea water in which hermits in a normal, healthy condition could be caught, could possibly be responsible but, as other theories had been proved wrong, trips were made to Llandudno and Anglesey and large quantities of sea water were brought back from both places—but with no better results. The wealth of marine life in these places was such that I could no longer accept even the possibility that the water was responsible. Perhaps it was the type of container, the temperature, the salinity, or perhaps a vast volume of water was required to supply them with suitable air. Yet, in the end, when all these ideas had been investigated, there was no choice but to reconsider the question of the water.

Enquiries were made at a local shop about preparations for making artificial sea water. Sure enough there was one, at what then appeared to be a somewhat exorbitant price, but by this time my curiosity had been aroused to such an extent that it now seemed more important to find the cause than to keep the specimens, and if artificial sea water did prove to be too expensive to carry on with indefinitely, there was still no question of my not giving it a trial.

The salts were purchased and the aquarium set up once more, and for what would probably have been the last time if the experiment had failed. But the experiment did not fail: two small hermits, collected locally, to my amazement did not seem to be affected and, miraculously, they thrived not only for weeks but for many months.

In the above paragraphs I have tried to give some idea to the reader of the difficulties with which I was faced. For brevity I have only mentioned the hermit crabs as being the species affected but, in fact, several of the more interesting invertebrates proved impossible to keep in natural sea water.

Even prawns, which had been purchased, and so were presumably less well adjusted to the pollution in coastal waters, failed to survive for long—and if prawns succeeded it was little wonder that my efforts with less hardy species lacked success. While a few books mention that coastal waters are not ideal, none that I have read stress the point, and, consequently, the ordinary person who cannot obtain his water from off-shore usually attempts to use seaside water with all its contamination. Moreover, most books state that natural sea water, if available, is preferable to artificial sea water and that, if artificial sea water is used, at least a small proportion of natural sea water should be added. Luckily, I have not found this necessary.

It may be that on some parts of our coasts, particularly near thinly populated areas, coastal water is sufficiently free from contamination to support life in aquaria but I have a reliable record of specimens dying even in “clean” water from the Cornish coast. The mystifying aspect of all this, of course, is that in sea water which will affect specimens overnight in aquaria, these same creatures are able to exist and thrive perfectly well in the same water in the sea.

Perhaps some reader with more knowledge of pollution than myself will be able to explain this? I have met several persons who have experienced similar
difficulties and, having dealt with the main point at issue, it may be of value to those readers who feel they would like to set up a marine aquarium if I briefly list some of the rules which I now try to follow.

1. I have continued and as vigorous aeration as practicable.

2. I could not resist the temptation to include some offshore species and the temperature must not therefore be allowed to fall much below 89°F (10°C). The combined heater and thermostat has proved the most suitable method of control because, when first switched on the heater affects the thermostat and makes it switch off before the correct heat is attained, so that the temperature rises very gradually in easy stages. Once the correct heat is reached, the differential, probably for the same reason, is very small and all this is ideal for marine life, unaccustomed as it is to such sudden fluctuations. The heater and thermostat is one I have used, which can be adjusted to the low temperature required.

3. I am careful to ensure that no feed is left to go bad in the water. If this does happen the results are the same as if one is using natural, contaminated sea water.

4. I try to include some harmless scavenging species in all my aquaria. A word of warning here: many scavengers cannot be regarded as harmless, e.g. shore crabs, which are excellent scavengers, can ruin an aquarium, moving rocks and killing anything which cannot escape their clutches. Large prawns, likewise, the best scavengers of all, can be very predatory. Tiny shore crabs may be used without mishap but they grow very quickly (suddenly with each moulting) and they can easily reach a dangerous size without one noticing.

5. I try not to be too ambitious: (a) filter feeders are not really suitable for aquaria and there is no point in keeping more than the occasional specimen. Even this may be done by slowly drying from starvation right from the day it is introduced. The larger the aquarium and the longer it is established, the better the filter feeders will survive, and the use of scavengers is here demonstrated to best advantage because should, say, a mussel die without one noticing, the situation may be saved, whereas without it the deaths would have to be replaced at considerable cost, not to mention the inconvenience. (b) Not all marine creatures live very well together in the same aquarium and when a new species is introduced I watch it very closely for a week or two. If it shows any tendency to harm the other inhabitants it is either returned to the sea or, if of sufficient interest, put in another aquarium containing more robust creatures. Even a species which is inclined to bully other species, though without damaging them physically, is removed because to observe anything from a scientific viewpoint one must ensure that all specimens are reasonably content.

6. I do not clean my aquaria out and I leave the algae to grow anywhere except on the front. Unfortunately sea weeds proper will not flourish in small home aquariums, even the reds only "surviving" for a varying length of time. For this reason I have not found them worth bothering with but I do encourage the long filamentous green algae (which comes itself) as being better than nothing. It is not attractive and I am quite convinced that the specimens are a good deal more comfortable with its presence.

7. I am aware of the fact that most marine animals are not accustomed to much light and I place the tanks in fairly dark situations, but situations which are still light enough to permit the growth of algae. I do not plague them with artificial illumination.

8. I have a corner filter in most of my aquaria and, although I do not consider filtration to be of major importance, in many cases I think it advisable, particularly when the algae becomes rampant, as a good deal is inevitably dislodged and needs to be filtered out if the aquarium is to remain clean. I prefer the surface type of filter as one can always see whether they are doing their job or whether they have become clogged up, but this is a personal fad.

9. For the bottom of the tanks I prefer a fine gravel in which the animals can bury themselves if they wish. I have, however, read the most extreme contradictions about this—one authority saying the gravel should consist of stones the size of small marbles and another saying that a shallow layer of fine sand, just deep enough to obscure the glass, is best. I would suggest that, although making for ultra-cleanliness, gravel as coarse as small marbles would make a very unpleasant home for most creatures and, likewise, such a shallow depth of sand would cause them almost equal discomfort. I consider that if animals want to bury themselves they should be allowed to do so and the gravel should be fine and deep enough for this. It is, however, preferable that the gravel should be of such a depth that it will get turned over from time to time and, obviously, the exact depth will depend on the size and type of the animals one is housing. Hermit crabs largely feed by sifting through the gravel and are particularly useful in this respect. Sand which is never turned over often becomes foul beneath the surface and when one day it is accidently disturbed, the rest of the water will be contaminated.

The addition of rocks will really make the aquaria, both from the aquarist's and the animals' standpoint. With a little common sense planning it is possible to make an aquarium suitable for both sand-loving and rock-haunting species and so enjoy the best of both worlds.

To keep things natural, rocks and gravel should be collected from the sea shore but do not forget that there are risks involved and will require a few weeks to soak if not longer in order to render one's artificial sea water as potent as the natural water. Earlier I mentioned that the cost of the sea water salts at first seemed exorbitant. Since then, however, I have changed my views. When I took into account the price of the vessels necessary for bringing home the sea water and the cost of the journeys to the coast, not to mention the unpleasant task of filling the bottles, I found that in fact the salts worked out quite cheaply after all. Moreover, sea water can be made at any time in emergency and this is no inconsiderable advantage.

I can state, not boastfully but only as a measure of my success, that in the 18 months since I first began using artificial sea water, excluding those few which have inevitably fallen prey to other stronger species, I have hardly lost a single specimen.

Books on Angling

Going Fishing Again, a book list for anglers issued by the Islington Public Libraries.

The book list is a revised edition of the Libraries' previous list, Going Fishing, and is a helpful guide to the Libraries' stock of books on all aspects of angling for the beginner and seasoned angler alike.

Course fishing is better represented than game fishing, reflecting a preference shown by the Libraries' users, although sea fishing books are also numerous. Going Fishing Again is available free of charge from any of Islington's public libraries. A copy will also be sent to anyone who writes, enclosing 4d. postage, to: The Chief Librarian and Curator, Islington Central Library, 68, Holloway Road, London N.7.

THE AQUARIST
**Labeo frenatus**

by JACK HEMS

This species from northern Thailand is one of the most charming and undemanding members of its widespread genus and, because of its peaceful disposition and pleasing coloration, is ideally suited to life in any community aquarium stocked with fishes that are neither too boisterous in their movements, for it is obviously ill at ease when there is too great a bustle going on around it, nor frighteningly large.

The body is greyish olive on the back shading to whitish on the lower sides and underparts. These, when a shaft of bright light catches them, shimmer in parts with pinpricks of bronzy gold. The minute scales are dark edged, and create a delicate netted effect. All the fins are suffused with red, and sometimes the anal and ventral fins are strikingly bright. The head is adorned with a black marking, that extends from the snout, across the golden rimmed eyes, to just beyond the gill covers. A bold black patch is present on the root of the tail. There are two pairs of barbels on the mouth.

The fish swims in a quiet and dignified manner, usually in the lower levels of the water. Unlike the better known red-tailed black shark (L. bicolor), which also comes from Thailand, it does not adopt eccentric resting postures, but keeps on an even, that is to say horizontal, keel. But like the latter species, it is fond of browsing on algae, and searching the compost for any edible matter that the other fishes have passed over, or would rather starve than pick up from the bottom. For this reason, L. frenatus may be classed as a scavenger.

According to a German authority, quoted by Professor Günther Sterba in his Freshwater Fishes of the World, the anal fin of the male develops a dark border. This may well be so, but at what age this distinguishing feature becomes manifest, and whether it is temporary or permanent, is not revealed. At all events, the few specimens owned by the writer, and other specimens seen by him swimming in dealers' tanks, all look alike, except for some variation, as mentioned above, in the intensity of colour in the anal and ventral fins of individual fish, or in single fish at different times. Nevertheless, it is reasonable to assume that a well-grown female in breeding condition would show fuller sides than a male. Be that as it may, there appears to be no record of this species breeding in captivity.

For the rest, L. frenatus flourishes well at a temperature range of 72° F (22° C) to 80° F (27° C), and is most at home in a tank filled with soft and acid water and well stocked with plants to provide plenty of bottom shade. It attains a length of about 3 inches.

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**The Speed of Fishes**

Few freshwater fishes are as fast-moving as our native pike. As it dashes towards its prey, it is said that its speed often exceeds 25 miles per hour. Conspicuous, too, for its swiftness of motion are salmon and trout. When swimming their fastest, they are capable of at least 25.25 m.p.h. Perch can manage about 10 m.p.h. The trout, despite its reputation of being a lazy fish, will attain about 7.5 m.p.h. when the need arises. Barbel, roach and chub are almost, if not quite, as fast. The tiny stickback (for size has little to do with the speed individual species can attain) can touch 6.8 m.p.h.

The speed of fish is recorded in several ways. One way is to place the fish undergoing a test in a trough-like container massed with vegetation at one end to provide an inviting retreat. Then, as the released fish dashes to cover, its rate of progress through the water is measured with a stopwatch. Sometimes a special course is prepared in a river. Still another way is to check the time it takes for a hooked fish to carry a thin line a predetermined distance. Notoriously fast-swimmers have also been photographed underwater with a cine camera, and their speed worked out between two points, the speed of the cine camera being kept constant.

But some of our tiniest tropicals can move amazingly fast apparent to anybody who has tried to net a zebra fish in a large unplanted tank. It must be remembered, too, that the terrific bursts of speed that the tiny hatchet fishes (Gasteropelecidae) are capable of, enables them to take their prodigious leaps out of the water, and so escape the jaws of their natural enemies. Yet the fastest freshwater fishes are shaggyards compared with their brethren that live in the sea. Take tunnies or tarpons. These fish can keep up with, and outstrip a ship travelling at 30 knots an hour. In point of fact, the tunny is said to be capable of about 44 m.p.h. Furthermore, it is able to maintain this high speed over a considerable distance. Nevertheless, the fastest marine species known to science is the swordfish. This fish has a cruising speed of about 35 m.p.h. Its maximum speed has never been ascertained, but must be nothing short of phenomenal seeing that it has been known to drive its bony sword through 1¾ ins. of solid timber.

B. Fry

August, 1965
Around the Aquariums

by MIKE SHEEDY

Readers visiting Scotland this summer for their holidays will find much to interest them if they should visit the Edinburgh Zoo Aquarium. Here will be found a marvellous collection of fishes, both cold-water and tropical. The Aquarium was built from the proceeds of a grant made by The Carnegie United Kingdom Trust and took 2 years to build, being opened to the public in the summer of 1927.

The entrance hall contains two spot-lit ponds, one housing golden orfe and the other a large and varied collection of the ever-popular goldfish. From here the visitors enters two large halls where the light filters through the tanks ranged along the sides, forming colourful, living pictures of aquatic creatures and plants. Many of the tanks are devoted to marine life and exhibits, including the green or edible turtle, hawk-billed turtle, conger eel, lobster, edible crab and a variety of sea fishes.

The freshwater tanks house many interesting specimens such as the giant salamander, electric eel, lung fish and that strange survivor of fossil periods the sail-finned fish (Polypterus). A large number of other fishes both cold-water and tropical, are also to be seen, the entire collection numbering several thousands and comprising over a hundred different species.

In the Annual Report for 1964 from the Edinburgh Zoo, just issued, it is noted that since the extensive alterations (which included darkening the hall and installing 15 additional illuminated tanks), interest from visitors to the Aquarium has greatly increased, and the number entering the Aquarium during the last 12 months showed an increase of over 20,000 on the previous year's figure. Since July, 1927 nearly 5 million people have visited the Aquarium.

Numerous donations of fishes, amphibians and invertebrates were received from friends, whose continued interest

Belle Vue's Aquarium

To put on a diver's helmet, sink beneath the waves, and to watch the strange ocean world whose dwellers wander at will among the tree-tops of their watery forests or dart over jagged mountains of painted coral as easily as you cross a room—this is an experience very few people can have. But almost as marvellous is a visit to Belle Vue's new Aquarium and Reptilium.

Once inside this magnificent building, you might easily imagine yourself to be taking a trip aboard a submarine, looking out through great windows into the depth of the sea. Concealed lights shine down from above the tanks that flank the walls, so that every detail, every strange shape, every vivid colour is clearly visible. Fish of amazing colour and form enhance the well planted settings or bring the beauty of the coral reefs before your eyes, a perpetually changing panorama.

I was taken around this most modern Aquarium and Reptilium (recently completed at a cost of over £50,000) by Mr. Raymond Legge, the Zoo Superintendent. He took me behind the scenes and showed me the machinery, which is running night and day pumping, filtering, aerating and heating or refrigerating water to suit the needs of the varied forms of life.

The entire project has been carried out by Belle Vue's own works department and every effort has been made to achieve authenticity and to create natural settings. The feature has been
A special review of
Aquatic Wonderland

Built upon the site of the former Aquarium and Reptile House, one of the country's oldest, but it now embraces the entire area of the original conservatories, the horticultural section having been moved to the western end of the Belle Vue Zoo Park. Much more space has been made available and every inch has been utilized. For behind the scenes there are extensive reservoirs, complicated water circulation systems, pumps, filters, heaters and electrical apparatus necessary to maintain the vastly increased number of exhibits.

The attractions at Belle Vue's Aquarium begin the moment you enter. In the first hall of comparatively small tanks are the living jewels of the tropical freshwater world. Familiar favourites like the angelfish, swordtails, neon tetras and black mollies are interspersed with such aristocrats and rarities as the salémia, the electric cat and reed fish.

In the second hall the display, "Fishes of the Coral Sea", will astonish and delight with the dazzling array of such fantastically colourful and strangely shaped fishes as the parrotfish, the puffer, the clown, the trigger, the betta and the lion fish, all exhibited in authentic coral reef settings.

Continued over page

In one hall of the new Reptile House, small lizards and snakes are exhibited in bright and colourful floral settings. Dazzling reflections have been minimized by the forward slope of the glass fronts and the dark surface inside the solid barriers.

Continued on page 85
Belle Vue's Aquatic Wonderland

continued from the preceding page

The third hall is the angler's paradise. Here may be seen both the familiar fishes of the British rivers, lakes and ponds, and the more colourful and interesting sea fishes of our coastal waters, ranging from giant conger eels and thornback rays, down to the tiny wrasses, gobies and blennies of the tidal pools.

Before leaving the aquarium proper, a row of special tanks—half terrestrial, half aquatic—is being prepared and will ultimately display those fishes which spend their lives either near the surface in search of air-borne insect food, or like the climbing perch and mudskippers, actually crawling out on to dry land. Such specimens form a fitting link with the reptile section to follow, since they illustrate admirably the transition stage of fishes to amphibians in the history of evolution.

In the first section of the Reptilium, the large and spectacular snakes, lizards and monitors are exhibited, each in an appropriate setting of rocky canyon, forests or desert scrub. Such 'monsters' as pythons, boa constrictors, desert monitors and iguanas never fail to fascinate their viewers.

The next feature is the tropical forest setting. The path leads towards a creeper-clad rock escarpment which is topped and flanked by dense jungle foliage. A waterfall tumbles into a limpid pool at the foot of the rock wall, and where the pool narrows, visitors may cross by a footbridge from which it is possible to gaze down on to fearsome crocodiles and alligators at close quarters. In one area of this tropical setting are giant tortoises; the largest weigh over 300 lbs.

The surroundings are so natural in this beautiful Reptilium that already American alligators have mated and laid eggs, a unique occurrence in Great Britain.

In the last section of the Reptilium, large numbers of smaller reptiles are pleasingly displayed. Here, amidst an array of horticultural splendour, are the tiny terrapins, the emerald green lizards, the beautifully patterned snakes, croaking tree frogs and others, each dwelling in a small representation of its natural environment.

During the course of my conversation with Mr. Leggo, I learned that many of the coral fishes are supplied to him by the Ceylon Tea Centre. Mr. Leggo also tells me that he has just completed a set of picture cards, illustrating the "Fishers of Ceylon", for the above concern. They represent many months of detailed work in watercolour painting together with a brief description of each fish. These will not be issued until next year and it is not yet known which tea company will be using them.

The new Aquarium and Reptilium has much to offer its visitors, especially those who are aquarists. There are of course many other remarkable exhibits to be seen in Belle Vue Zoo, all part of the splendid progressive development programme there.

THE AQUARIST
The Golden Dwarf Barb

by LEBISTES

The golden dwarf barb is attractively coloured, docile by nature, lively in its movements and small in size—a mere 1½ in. when fully grown. All this, of course, recommends it for a tank of a few gallons to itself, or a place in a community tank with the more diminutive fishes. It is found in the wild in the lakes, pools and streams of Orissa, Bengal and Assam, and is scientifically known as Barbus gollis.

The male's body is golden on the sides, olive on the back and silvery white on the underparts. A coppery tinted stripe extends from behind the gill-covers to the root of the tail. Above and below this shining band are several black blotches and streaky markings. The pectoral fins are colourless. The dorsal, anal and ventral fins are yellowish; the caudal fin is yellowish tinged with red. There are no barbels on the mouth. The female is not quite so colourful as the male, and is the larger of the two sexes.

The species flourishes best in a well-planted aquarium kept clear of sediment and filled with mature water. A temperature range of 70°F (21°C) to 75°F (24°C) is ideal for normal maintenance and breeding, but a slow drop to 65°F (19°C) or thereabouts will cause no deterioration in the fish's health or activity, even if held over a lengthy period.

*Barbus gollis* is a hearty eater, and will feed readily on any dried food, white worms, crustaceans and the like, together with all the usual substitues for live food such as scraped raw or cooked red meat, or finely shredded, plainly boiled shellfish. It also has a partiality for mossy algae and other soft greenstuff.

Breeding

To breed it, a tank measuring at least 18 in. by 12 in. by 12 in. is required. This should be carpeted with well-washed compost, on which hunched plants should be anchored to trap the eggs. The plants most suited to this purpose are those having furry or feathery foliage such as *Myriophyllum or Lemnophila (Ambulia)*. The tank should be stood close to a window, in a sunny position, or failing this, have a 60 watt electric lamp fitted immediately above the water to provide a really bright light.

Separating the sexes for a week or two, and paying more attention to the quality of their diet (only the meatiest and most greedily taken live food should be given during their separation) will usually bring them into spawning condition. This condition is denoted by extra fullness in the female, brighter colors and a more excited manner in the male.

The actual spawning procedure is quite simple. It amounts to this: after some false starts, the female dashes about the aquarium hotly pursued by the male. Every now and then they make for the plants, where, drawing together, the female drops some sticky eggs and the male fertilises them. After the female has been stripped of her spawn (a spawned-out female is easily recognisable by her shrivelled sides and rather bedraggled appearance), both fish must be removed from the aquarium before they gobble up the eggs.

The eggs hatch quickly—within 30 hours, but the fry remain stationary on the bottom, or clinging to the sides of the tank, for another 2 days. Then they begin to explore their surroundings, and need the tiniest of live food (freshly cultured infusoria), or flour-dried food, supplemented, if possible, by tablespoonfuls of green water (free-swimming algae) followed, a week or so later, by micro worms and items such as sifted Daphnia.

At a month old it is advisable to transfer some of the fry elsewhere, or install artificial rearing, to preclude rapid diminution of oxygen in the water. As a rule, with plenty of swimming space in a well-aerated tank, a batch of young will obtain full size in well under a year.

Around the Aquariums

continued from page 83

waterways running off. The river offers good sport for the angler. Visitors can obtain daily fishing permits and licences for salmon and trout from the main office in the Hall.

When electric eels are on display in Aquariums they are easily located by the curious clicking noise which comes from their tank. As they move, the eels emit brief electric pulses, up to 10 volts, which radiate out into the surrounding water and when there are obstacles or other fishes nearby the eels are able to perceive changes in the pattern of current flow. Coming from muddy waters and rivers like the Amazon and Orinoco, where good eyesight is of little use or help, these eels have almost lost the use of their eyes, but these direction-finding pulses emitted by an organ in their tails serve them well instead.

When it comes to stunning their prey, or when they are alarmed, a much larger electric organ comes into operation, which is capable of producing as much as 200 volts in the water. In the aquarium these pulses can be picked up by two electrodes in each corner of the tank and converted into audible “clicks” through a loudspeaker.

Again this winter I am holding a Zoological Exhibition in Sheffield. Last winter the exhibition went down very well and once from all over the world sent me material such as photographs, posters, zoo guides, books, charts and many other items of interest.

During the exhibition I also gave out thousands of hand-outs sent to me by various zoos. To any zoos or aquariums who would like to send hand-outs or material for my Exhibition I would be grateful (please address material to 19 Vine Street, Rotherham, Yorks.).

August, 1965

85
AQUARIST'S Notebook

by P. M. FULLER

The first building one sees as the ship rounds the promontory before sailing into the harbour at Rhodes is the Aquarium and Hydrobiological Institute. By no standards can this cream and maroon construction, capped with a cupola like an Orthodox Church, be described as an imposing building, but the collection it contains is worth a visit if one is staying at this magnificent island, called Apollo's playground.

The first room one enters on passing through the ornate entrance, elaborately decorated with designs depicting aquatic animals of all sorts, is the museum. Here are contained many fascinating but appallingly presented specimens. Splendid marine animals, seals and mammals from depths of the Mediterranean Sea are put on show like rawhide pieces of stuffed skin! The proprietors of the Institute—which itself is run on scientific lines as a research station, have also succumbed to the inclusion in this otherwise entirely marine collection of certain other "eye-catchers" to please the tourists: such as an eight-legged crab and a one-eyed kid. But if the atmosphere of the museum is essentially one of death, decay and mutation, the contented grunts of a large, over-fed, and much pumpered seal on the balcony outside, assures one that life in the building still very much exists...

...Descending the steps to the Aquarium below, one passes into the familiar dark and silent world in which the fishes are kept. My first impression, one which a subsequent closer examination proved justified, was of a great misuse of space. The tanks were small—too small for the inmates, and the spaces between them were large, filled by an irregularly shaped concrete wall. The whole aquarium is arranged in an artificial horse-shoe cave and as one walks round perhaps two-thirds of what one sees is wall, which is a great pity because the contents of the tanks are extremely exciting. Placed only a few yards from the sea, and supplied with a constant flow of ocean water which enables the fishes to survive in the small tanks, the aquarium is understandably entirely marine. One can observe large turtles and octopuses; the latter one commonly sees on a plate, or at the end of a fisherman's pole in Greece, and it is a pleasure to see them very much alive in the safety of a glass tank. The Aquarium also possesses a large and varied collection of rock fishes, in addition to a smaller range of deep-sea varieties. Some difficulties have been encountered in the labelling of specimens. Rhodes is an international holiday resort and it has been found necessary to label in four languages, which means that in a tank containing many different sea creatures it is not possible to label all of them. This is sometimes disappointing because I observed several exciting species which were entirely new to me.

If one could talk about the mood of an aquarium one would have to describe this one as overly elaborate. Pleasing as the black and white pebble floor, with its sea-horse and cockles designs, is to the eye, one only wishes more space and care had been given to the arrangement of the tanks themselves. It hardly comes as a surprise to learn that the Aquarium was of Italian design. Italy, one-time centre of Rococo art, has always loved elaboration and ornamentation...

...In sharp contrast to Greece the aquarium hobby in Turkey has been firmly established. I particularly remember a shop in Istanbul selling several species I had never seen before in its tropical collection. In a roadside cafe, I saw a most interesting assortment of local Turkish specimens—and so it was perhaps understandable that the small but clear and simple aquarium in the zoo at Ankara should be more in sympathy with accepted aquarium-keeping techniques that the heavily ornamented establishment at Rhodes. Like almost every other institution in Ankara the Zoo is dedicated to Ataturk—the great hero of the Turkish liberation. Its aquarium contains a well presented and representative selection of most of the more common tropical fishes—being particularly strong in its wide variety of barbs. I also noticed that the tanks of guppies must have been attended to by the selective hands of a careful and experienced breeder, for there were several magnificent males sporting extremely handsome tails. Characins and cichlids were well represented: in fact my only criticism of this little Turkish aquarium is exactly the opposite of that felt in Rhodes: it perhaps shows too little originality. But one must remember that specimens are not readily available in a provincial Turkish town.

Additional Notes by T. ROLAN

Although I met this often enough, I never cease to be astonished at how incautious some people are about the way in which they convey water to their aquaria. So often when trying to elucidate the reason for some symptomless and mysterious fish deaths in an aquarium I find that the tank has been topped up with water carried from the tap in a household container such as a bucket or bowl which does duty most of the time for washing up, laundry and general cleaning.

Such containers can have held soda, bleach, detergent, insecticides, paint-cleaners and, sometimes, even weed-killers, all of which can be lethal to fishes in quite small amounts. Merely rinsing a bucket that has held such agents may not be enough to clear it for aquarium use. Very thorough washing is required, and to save all this bother and possible danger the answer is to keep one of the cheap plastic buckets, preferably with a pouring lip, or jug exclusively for aquarium use...

...Have you ever kept a butterfly fish? Not a very exciting species this, despite its unusual form, for it spends so much of its time stationary just below the water surface, moving only to feed or to chase another butterfly fish away if others are in the tank with it. One I have, however, has

Continued at foot of facing page
Fairground Goldfish

The practice of offering live goldfish as prizes on fairground stalls is frequently criticised in _The Aquarist_ and elsewhere, and the fish concerned have been described as runts and throw-outs.

From numerous experiences I have reached the conclusion that the vast majority of goldfish stocked by pet shops are no better than their fun-fair counterparts, and indeed not as good.

I have several goldfish at present which were won on a fairground last September. On arrival they were found to be suffering from a swimming disorder but after a few days they recovered, and are now quite as healthy as any fish I have obtained in a shop.

Looking around pet shops recently I found it to be practically impossible to find a single goldfish which looked really healthy. Practically all of them were hump-backed. Many of them were listless, fins folded, and looking as though they might expire at any minute.

The conditions under which shopmen keep their fish may be bad, but cannot be much worse than the conditions in the shops, with the fish crowded together to such an extent that I am surprised enough of them survive to be sold, for them to be a worthwhile proposition.

About three years ago I ordered some fish from a well-known firm, thinking that stock supplied by such a reputable firm would be superior to that obtainable from an ordinary pet shop. I was soon to be disillusioned on that score. Each one was pitifully stunted and mis-shapen. In future I only buy when I can see what I am buying, and after visiting the pet shops it occurs to me that if I want more goldfish the best plan is to wait until I visit a fair.

M. J. Broomefield
Tiverton, Devon.

Although we would agree that it is always best to see the fish one is buying, we cannot believe that fairground fish are more likely to have received better care or to be of a more satisfactory stock than fish kept and offered for sale by shops specialising in aquatic supplies.—Editor.

Correction

In your "News from Aquarists' Societies" feature (May), you quote North Warwickshire A.S. reference to Mr. D. Lencan as being "a founder member of S.A.S.S." (Society of Aquarists of South Staffordshire). This is quite incorrect as Mr. D. Lencan is not a founder member of S.A.S.S.

Here, in alphabetical order, is the list of the founder members: Egginton, W., Hammot, P., Nash-Fowlsby, B. (Mrs.), Poole, P. (Miss), Simkins, A., Simkins, T. These are the only six founder members of S.A.S.S., having attended the preparatory meetings as a result of which the Society was founded on Thursday, 30th April, 1964, at the Pennard Country Club, Aldridge, Nr. Walsall. Mr. M. D. Lencan, the present vice-chairman of S.A.S.S., to my knowledge, did not join the Society until some months later, when he was co-opted on to the committee in an advisory capacity.

Contrary to another statement which appeared in _The Aquarist_, attributed to Mr. Egginton, several months ago, in which three names were given as being the list of founder members of S.A.S.S., one of these three names, specifically that of Mr. D. Slater, was erroneously included.

The points I have raised may possibly appear trivial, but in the interests of accuracy, I feel they should go on record.

P. Hammot, M.D.,
Former chairman, Committee of S.A.S.S.,
Walsall, Staffs.

Aquarist's Notebook

continued from the opposite page

emphasised itself by the way it has decided that aquarium life demands the development of new feeding habits.

Usually these fish will eat only the typical surface foods such as small flies and other floating insects or coarser dried food. More committed adapting to winter conditions when insect foods were in short supply by taking Tubifex worms held in forceps just at the water surface, but now he presents being offered anything smaller than garden worms, and will seize and gulp down two or three quite large worms a day. This is surely a quite a perverse habit for such a fish, but although his belly bulges in a most un-butterfly like manner after a worm feed his digestion is obviously equal to the diet. Which shows that one must always be prepared to be a little unorthodox with the fishes whose feeding appears to present difficulties; they are often more accommodating than one expects.
About the Pond
this Month

by A. BOARDER

If young fish have been bred in the pond they may now be in evidence. When very small they may not be seen by the pondkeeper on an occasional visit to the pond, but if a quiet approach is made the small fishes may be seen as they emerge from under a water lily leaf, where they like to rest. Some fine food can be given once a day for such youngsters, and as it floats on the surface the little fish may be seen eating it if no sudden move is made.

Many people have installed small fibre-glass or plastic pools in their gardens. Many of these are very good but some are so small that it will be no easy task to keep them in good order. There is no doubt that it is far more difficult to keep a very small pool in good condition than it would be with a larger one. Any aquarist will tell you that it is much easier to keep a large tank in order than a tiny one, and the same point applies to the pond. The real problems with these small pools can arise when the winter comes and severe frosts are experienced. The water could freeze almost solid and although it might not take long to thaw out after a minor freeze-up, it could be hard enough to do considerable damage to the pond and its inhabitants. It would be much safer to install a small heater such as used in a tropical tank to prevent the water from freezing all over. For a small pool a low-wattage heater of this kind will be satisfactory and it need only be switched on during severe nights. If such a one is fitted make sure that the electric cable and fuse box are installed by someone who knows all about the job as electricity in or near water can be a dangerous combination.

BRITISH AQUARISTS' FESTIVAL
27th—28th NOVEMBER, 1965

Schedule covers all classes as in 1964 and copies are now available from:

G. W. COOK, "SPRING GROVE", FIELD HILL, BATLEY, YORKSHIRE

The AQUARIST Crossword

Compiled by M. W. SAUNDERS

CLUES ACROSS

1. Zebra cockatoo (8-6).
2. Does this fish dance in a column? (8).
3. Like in say (6).
4. Encourage giant growth resulting in weight problem (10).
5. To hold back water (6).
6. There might be a run on it (4).
7. Look—well (10).
8. Small fish in large aquarium (6).
9. You can go up it (6).
10. Might his head be in the clouds? (7-4).
11. A hose of propagation (8).
12. The tank guy round the tank (8).
14. Fish part that may be sold (8).
15. Do fish actually live here? (6-8).
16. On which a tank may sit (6).
17. The whole (6).
18. The bars top part of a circle (3).
19. Where pondsides may tread with safety (6).
20. Places where of conditions are not right (3).
21. Think you understand it? (3-6).
22. Error (4).
23. Run or rip (4).
24. Hemisierosoma erythrocephalum (10).

CLUES DOWN

1. Nymphs series named (4-3).
2. Misleading (8).
3. Around the mean for bagpipes (9).
4. Valuable, when half cooked (9).
5. Shrugged side (8).
6. Leave in rubber (8).
7. Entice to (6).
8. Pond dwelling egg-layer (9).
9. Separated without the cover (8).
10. Not heard as much (6).
11. Multiplied spread (10).
12. May carry the family tradition (1-8).
13. Collector's piece (8).
14. Refusing to eat once unpopular (8).
15. This may have been named (10).
16. The tank guy round the tank frame (5).
17. This is more attacks and knows (5).
18. Measurements of a fish part (6).

Solution on page 91

THE AQUARIST
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 Caspian A.S. Open Show was very well supported in 27 classes. There were many interesting exhibits.

The chairman and the committee were present and the fish were displayed on stands. The judging began promptly and the results were announced at nine o'clock. There were several interesting exhibits, and the winner of each class was given a blue ribbon. Mr. A. J. Woodrow was the winner of the best all-round exhibit, and Mrs. F. C. P. Bowler was the winner of the best all-round exhibit for single species. The judges were Mr. J. G. Smith and Mr. J. R. T. Potter. There were several excellent displays of fish, and the entries were very varied. The prize money was £100, which was divided among the winners.

A SOCIAL evening was held at Blackpool and Fleetwood recently and 74 members from various places attended. A three-course dinner was served, and the ladies' committee took charge of the evening. The main attraction was a slide show given by Mr. T. W. Taylor. The slides were very interesting, and the ladies enjoyed the evening. The chairman and the committee were present, and the fish were displayed on stands. The judging began promptly and the results were announced at nine o'clock. There were several interesting exhibits, and the winner of each class was given a blue ribbon. Mr. A. J. Woodrow was the winner of the best all-round exhibit, and Mrs. F. C. P. Bowler was the winner of the best all-round exhibit for single species. The judges were Mr. J. G. Smith and Mr. J. R. T. Potter. There were several excellent displays of fish, and the entries were very varied. The prize money was £100, which was divided among the winners.

The Newcastle Guppy and Livebearer Society held its annual dinner at the Poynter, where the dinner was served. There were many interesting exhibits, and the winner of each class was given a blue ribbon. Mr. A. J. Woodrow was the winner of the best all-round exhibit, and Mrs. F. C. P. Bowler was the winner of the best all-round exhibit for single species. The judges were Mr. J. G. Smith and Mr. J. R. T. Potter. There were several excellent displays of fish, and the entries were very varied. The prize money was £100, which was divided among the winners.
THE Portsmouth A.S. held a table show for the benefit of the Tongueless Committee.

The Society’s table was at the back of the room.

The judge was Mr. J. Stewart of London.

The results were as follows: Goldfish; 1, Mrs. A. G. Hart (Portsmouth); 2, Mr. G. H. Reynolds (Portsmouth); 3, Mr. W. G. H. Hyman (Portsmouth); 4, Mr. H. Goodall (Portsmouth); 5, Mrs. R. J. Goodall (Portsmouth); 6, Mr. M. B. Smith (Portsmouth); 7, Mr. J. S. Goodall (Portsmouth); 8, Mr. W. J. Goodall (Portsmouth); 9, Mr. J. R. Goodall (Portsmouth); 10, Mr. W. J. Goodall (Portsmouth); 11, Mr. J. R. Goodall (Portsmouth); 12, Mr. W. J. Goodall (Portsmouth); 13, Mr. J. R. Goodall (Portsmouth); 14, Mr. W. J. Goodall (Portsmouth). Silver stars were won by Mr. J. S. Goodall and Mr. J. R. Goodall.

Any new member can be assured of a warm welcome.

THE June meeting of the丁丹森 A.S. was well attended and was a fine table show of the season for the Kentish-Trojan, A. A. and C. A. The entries were judged by P. F. Newton, and the results were as follows: Champions—A. A. and C. A., 1, Mr. H. Goodall; 2, Mr. W. J. Goodall; 3, Mr. J. R. Goodall; 4, Mr. W. J. Goodall. The trophies were presented by Mr. H. Goodall.

THE members of the Chapel & District A.S. were organized for a private show at their June meeting, the entries of the slides giving a commentary on types of fishes and plants and location of plants. The slides were beautifully arranged under the microscope.

The Society met on the first Wednesday of every month at 7 p.m. at the Memorial Hall, Underwood, and the secretary is Mr. D. C. Hall, 22 Underwood Road, Chapel, Middlesbrough, No. Sheffield.

NEW SOCIETIES

A SOCIETY has been formed at Stockton-on-Tees and this will be known as the Stockton-on-Tees A. S. (T.O.S.A.). Meetings will be held every third week, the first being held on Thursday, March 1st, at the Green Tree Hotel, Hartlepool. Anytime interested in the society is invited to the first meeting at 9 p.m., and further details can be obtained from the secretary, Mr. J. R. Goodall, 24 Underwood Road, Stockton-on-Tees.

A SOCIETY has formed at North Shields and this will be known as the North Shields A. S. Meetings will be held every third week, the first being held on Thursday, March 1st, at the Green Tree Hotel, Hartlepool.

A SOCIETY has been formed at Newcastle, and this will be known as the Newcastle A. S. Meetings will be held every third week, the first being held on Thursday, March 1st, at the Green Tree Hotel, Hartlepool.

THE Durants A. S. is holding a private show at their June meeting. The Society has about 15 members at present, but no view of the interesting interest in the keeping of tropical fish is required of this society.

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THE AQUARIAN

The society will meet on the third Wednesday of every month at Barkley Hall, Secretary, Mr. M. J. Goodall, 12 Barkley Road, Barkley, and the secretary is Mr. D. C. Hall, 22 Underwood Road, Chapel, Middlesbrough, No. Sheffield.

PETERLEE and District A.S. held a meeting in the A. E. Boardroom of the A. E. Boardroom, Lincolns Inn, London.

The Society met on the first Wednesday of every month at 7 p.m. at the Memorial Hall, Underwood, and the secretary is Mr. D. C. Hall, 22 Underwood Road, Chapel, Middlesbrough, No. Sheffield.

At the Annual meeting of the A. E. Boardroom, a committee was elected to continue the Society for another year.

The meeting was adjourned at 12.30 p.m.

THE society will meet on the third Wednesday of every month at Barkley Hall, Secretary, Mr. M. J. Goodall, 12 Barkley Road, Barkley, and the secretary is Mr. D. C. Hall, 22 Underwood Road, Chapel, Middlesbrough, No. Sheffield.

At the Annual meeting of the A. E. Boardroom, a committee was elected to continue the Society for another year.
to re-stock their existing cultures, and also the visit enabled new clubs to purchase Chanel, Stropharia, and White Grapes etc. at very reasonable rates.

The following week the club held a busy pairs competition and an 'end of season' party, with a well-attended turn-out.

The third meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse. The meeting was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse. The meeting was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The fourth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The fifth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The sixth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The seventh meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The eighth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The ninth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The tenth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The eleventh meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twelfth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirteenth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The fourteenth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The fifteenth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The sixteenth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The seventeenth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The eighteenth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The nineteenth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twentieth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The twenty-first meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twenty-second meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The twenty-third meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twenty-fourth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The twenty-fifth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twenty-sixth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The twenty-seventh meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The twenty-eighth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The twenty-ninth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The thirtieth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirty-first meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The thirty-second meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirty-third meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The thirty-fourth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirty-fifth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The thirty-sixth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirty-seventh meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The thirty-eighth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The thirty-ninth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The fortieth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

The fortieth meeting of the season was held at Mrs. E. B. M. Good's house and included a visit to the new glasshouse.

The fortieth meeting of the season was held at Mr. A. W. Jones' house and included a visit to the new glasshouse.

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