

The Aquarist

and Pondkeeper

AUGUST 1965



MONTHLY
Vol. XXX No. 5

TWO SHILLINGS AND SIXPENCE

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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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Odd sizes made to order, painted any colour, guaranteed square and free from welds. Stove enamelled Corner Bows, Bow Fronts and Wrought Iron Units.
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Fine Grade for Tropicals and
Coarse Grade for Cold-water Fish*

Extra high in protein and rich in vitamins and minerals, Phillips Fish Food contains dried shrimp, daphnia, meat meal, white fish meal, alfalfa, milk powder, cod liver oil, wheaten cereal and yeast, scientifically blended to provide a well-balanced, nourishing food.

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*Phillips Cold-water Fish Food contains
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The unrivalled treatment for fungus and finrot

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Effective

— Colourless

— Does not harm the plants



Before Treatment



After Treatment

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

LIQUITOX is pure phenoxetol. Recommended by authorities in the U.K., Holland, Germany, Australia, U.S.A. and other countries.

LIQUITOX has a unique double action. Firstly it has positive effect on the fungus or gram-negative bacteria. Secondly Liquitox stimulates the mucous secretion, thus helping the natural defence mechanism of the fish.

Also recommended for Ichthyophonus.

Please note new price. 2/- for 2 capsules, each sufficient for 4 gallons of aquarium water. Breeders pack 6/9d for 12 capsules.



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The most versatile trap available. Can be used for breeding 1 or 2 livebearers, as a red trap for breeding egg-layers or as a self-cleaning display rack for 1 or 2 Series. Price 38/6d.

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A unique liquid containing (a) particles of immediate food value to the fish and (b) substances to produce natural infusoria in the minimum possible time.

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

Liquifry No. 1 for fry or Egg-layers } Price 2/6d.
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POSTAL SERVICE

TROPICAL FISH



Interesting fish this month

Chocolate Gourami .. 8/4 each	Cummings Barbs .. 7/8 each	Acid Fish 12" .. 42/- each	Silver Foxes .. 5/4 each
Oppahem Gourami 7/6 ..	Adult .. 7/8 each	Adult Wild Angels .. 45 0 0 pair	Sora .. 10/6, 12/6, 15/- ..
A.S. Albino Tiger Barbs 10/- ..	Mollus Cat .. 10/6 ..	Pinkish Pinnacleds 90/- each	Cherry Barbs Adult .. 4/6 ..
Diana .. 55/-, 45/-, 35/- ..	Baldie Baldie .. 3/- ..	Flouha 2" .. 40/- ..	Anostomus .. 17/6 ..
Flouha .. 4/6 ..	Bleeding Hearts .. 10/6 ..	Clark Catfish .. 39/- ..	Delta Guppies .. 17/6 ..
Superb Half Black Guppies .. 15/- pair	Blue Flouha .. 3/- ..	Hemostomus Trifasciatus 4/6 ..	

TROPICAL FISH LIST AUGUST REGULAR STOCKS ARRIVING WEEKLY

LIVEBEARERS		RASBORAS		CICHLIDS	
Guppies		Harlequin .. 2/4 each		Angels	
Golden .. 4/- pair		French Rasboras .. 4/4 ..		Standard .. 2/- each	
Delta .. 17/6 ..		Sulcor Tails .. 2/9 ..		Lace .. 2/6 ..	
Half Black .. 18/- ..		Rasbora Maculosa .. 2/- ..		Blue Acara .. 2/4 ..	
Fancy .. 8/6 ..		Rasbora Dorsivittata .. 2/6 ..		Jepphorgan Japsari .. 8/6 ..	
Lace .. 4/- ..		Hyorrasbora .. 2/6 ..		Lace Veilid .. 7/6 ..	
Swordtails		Subscaris .. 2/6 ..		Vad .. 7/6 ..	
Red Standard .. 2/6 each		Glowlight .. 3/6 ..		Black .. 4/6 ..	
Green .. 2/4 ..				Black Veil .. 10/- ..	
Albino .. 2/4 ..				Sevel .. 4/6 ..	
Red Wagtail .. 3/6 ..				Convict .. 3/6 ..	
Red Eye Red .. 4/6 ..				Passive .. 4/6 ..	
Siamese Red .. 12/6 pair				Markle .. 3/6 ..	
				Firemouth .. 3/9 ..	
Platies					
Victory .. 3/- each				DWARF CICHLIDS	
Blue .. 3/- ..				Kribia .. 10/- ..	
Merigold Varietas 10/6 pair				Apistogramma	
Hi Fin Varietas 17 10 0 pair				Agassiz .. 8/6 ..	
Red .. 3/- each				Ranip .. 9/- ..	
Black .. 3/- ..				Kamarell .. 5/6 ..	
Red Wagtail .. 3/- ..					
Yellow Wagtail .. 3/- ..				DANIOS	
Lemon .. 3/- ..				Spined .. 2/6 ..	
Varietas .. 7/6 pair				Green .. 3/6 ..	
				Pearl .. 2/- ..	
Mollies				Frank .. 2/6 ..	
Green Lyretail Mollies 4/- each				Zebra .. 2/- ..	
Black Lyretail .. 3/- ..					
Black .. 3/- ..				SHARKS	
Adult Black Saffin 15/- pair				Red Fin .. 7/4 each	
Liberty .. 4/6 each				Red Fin .. 5/- ..	
Adult Green .. 10/- ..				Red Tail (black) .. 7/6 ..	
Green Veilid .. 1/- ..				Black .. 6/4 ..	
Monaco Fish .. 3/- ..					
Half Beak .. 4/- ..				VARIOUS OTHERS	
				Madagascar Rainbows 5/4 each	
CHARACINS				African Knife Fish 10/6 ..	
Tetra				Malayan Angels 12/6, 15/- ..	
Glowlight .. 2/6 each				Bumble Bee .. 3/- ..	
Neon .. 3/6 ..				Silver Fox .. 5/- ..	
Neon .. six for 17/6				American Flag .. 4/6 ..	
Red Fin .. 2/6 each				Leaf Fish .. 4/- ..	
Flame .. 2/6 ..				Australian Rainbow .. 2/- ..	
Cardinal .. 4/6 ..				Glass Fish .. 3/- ..	
Red Eye .. 3/6 ..				White Cloud Mountain Minnow .. 2/- ..	
Lemon .. 4/- ..				Macynna Schreinmuller .. 12/6 ..	
Black Line .. 3/6 ..				Puffers .. 10/- ..	
Serpas .. 5/- ..				Butterflies (adult) .. 12/6 ..	
Rasboras .. 4/6 ..				Tony Eels .. 6/6 ..	
Beacons .. 2/6 ..					
Black Widows .. 2/6 ..					
Belgian Flag .. 4/6 ..					

All fish guaranteed live delivery and in good disease free condition. 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.

ALSO FULL SELECTION OF PLANTS EQUIPMENT ETC.

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ZOOSEKO
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£12 INCLUDING FILTER MATERIALS
(SEE ARTICLE IN APRIL ISSUE OF "THE
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BACKING PAPERS—2 1/2" wide, 1/2 pph ft.
STRATA ROCKWORK, PEBBLE BEACH, SEA
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WINGLESS FRUIT FLIES CULTURE
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WHITE WORM, 1 oz.

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A LARGE SELECTION OF FRENCH CERAMIC
ORNAMENTAL DIFFUSERS ALSO IN STOCK

WE HOLD IN STOCK A LARGE VARIETY
OF LIVEBEARERS, CHARACINS, SAGES,
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TETRAS, SUCKER FISH AND MANY RARE
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SWIRLAWAY BATTERY POWERED
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- HAND

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2" per bucket per bag 1 lb
RED — YELLOW — LAVENDER — ORANGE
BLUE — RAINBOW

NEW GRO-WEL BUBBLE-UP AQUARIUM FILTER

(UP TO 10 TIMES THE POWER OF OTHER
FILTERS) 25/- each

DAPHNIA AND TUBREX ALWAYS IN STOCK
PERSONAL CALLERS ONLY

PEMCO STAINLESS STEEL FRAMED AQUARIA

	Aquarium	Reflector
34 1/2" x 12 1/2" x 12 1/2"	130/-	71/6d.
20 1/2" x 12 1/2" x 10 1/2"	105/-	61/-
14 1/2" x 10 1/2" x 8 1/2"	67/6d.	38/6d.
12" x 10 1/2" x 6 1/2"	55/-	35/3d.

AQUARIA

BOW-FRONTED AQUARIA	
24" x 12" x 15" WITH	.. .. .
26" x 12" x 15" PLAIN	.. .. .
48" x 10" x 15" STAND	.. .. .
26" x 12" x 15" WITH WROUGHT-	.. .. .
48" x 10" x 15" IRON BOOKCASE	.. .. .

ARBE PLASTIC BOW-FRONTED AQUARIA

(Fully wired for heating and lighting. Heater
and strip bulb only to be added.)

18" x 12"	.. .. .	.. .. .	.. .. .
24" x 12"	.. .. .	.. .. .	.. .. .
24" x 15"	.. .. .	.. .. .	.. .. .
26" x 12"	.. .. .	.. .. .	.. .. .
26" x 15"	.. .. .	.. .. .	.. .. .
36" x 12"	.. .. .	.. .. .	.. .. .
CORNER CONCAVE FRONT	.. .. .	.. .. .	.. .. .

CARRIAGE ON AQUARIA AT COST,
TERMS: CASH WITH ORDER.

All Standard Sizes of Aquaria in
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ALL ABOUT TROPICAL FISH
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ILLUSTRATED DICTIONARY OF TRO- PICAL FISH
FRESHWATER FISHES OF THE WORLD
EXOTIC TROPICAL FISH (LOSSIE LEAF)
TROPICAL AQUARIUM FISH

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UP TO 10/- — 1/6d.; 20/- — 2/-; 30/- — 2/6d.

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for Livebearer Fry

2/6 per pack



E Red Label

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Prepared by experts in aquarium fish nutrition

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BLUE GULARIS 50/- pair
 RED NOSED TETRA 6/- each
 ADULT FESTIVUM 7/6 each
 8" ELECTRIC CATS 30/- each
 LARGE CARDINAL TETRA 7/6 each
 BABY RED TAIL SHARKS 2/6 each
 ADULT GLASS FISH 5/- each
 ADULT DWARF GOURAMI 5/- each
 SMALL DISCUS 25/- each

"GREEN SHIELD" STAMPS GIVEN (PERSONAL SALES ONLY)

NEW ARRIVALS

Golden Orfe 4"-7" 5"-6" 15/- & 22/6
 Platys .. 4/6 to 7/6
 Green Tetra .. 3/- & 4/-
 Large Goldfish 7"-8", 9"-10" 10/- & 15/-
 Small Orfe .. 3/-
 Medium Goldfish .. 5/- to 7/6
 Small Goldfish & Shou .. 1/- to 2/6
ALL FISH PLANTS STOCKED

THERMOSTATS

Procter .. 20/-
 Constant External .. 25/-
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 Inter-Pet .. 22/6, 28/6
UNO
 Out/Ad. .. 18/-
 In/Ad. .. 15/-
 In/Ad. "Popular" .. 10/-
 "Popular" with neon indicator .. 12/6
 Press Matc .. 24/6
 Wizard .. 18/-, 12/6, 18/-

AERATORS

Jero .. 20/-, 28/6 & 38/6
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 Quicke .. 23/-
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 Mastron Matc .. 24/-
 Mastron Mantr .. 21/-
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 Dymax No. 1 A.C./D.C. .. 29 0 0
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Orrer .. 29 0 0
 Stokes .. 27 18 6

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Hydra Junior New Super .. 187/6
 Hy-do "A" .. 120/-
 Hy-do "B" .. 165/-
 Hy-do "C" .. 200/-

Thermometers
 Mercury .. 4/6
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 Glass Wool 1/-
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 Hydo Outside .. 15/-
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 Klear King .. 22/6
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 Rock Filter .. 17/6

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Neons, 9 for £1 1/2 1/8 each

Rosanna .. 4/-
 Angeli .. 2/6 & 3/6
 White Cloud ..
 Minnows .. 2/6
 Flaxes .. 2/6
 Beacons .. 2/6
 Black Widows .. 2/6
 Flatsy varieties ..
 from 2/6
 Swordtails ..
 various, from 3/-
 Schobert barbs 3/-
 Scissorails 3/-
 Guppies (pair) 1/6, 5/-
 Harlequins .. 2/-
 Cherry barbs .. 2/-
 Nigger barbs .. 2/-
 Chequer barbs .. 2/-
 Red Eyed Tetra 3/-
 Think Up 3/-, dwarf or leari 2/6, Kissing 4/-,
 Opaline 2/6, Gourami.

"SWIRL-AWAY"

Aquarium Vacuum Cleaner .. 48/6
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BOOK CASE
BOW-FRONTED AQUARIUM
 48 x 18 x 15 .. £25 18 0
 36 x 12 x 12 .. £24 18 0
 Standard Bow £27, £17, £13 0 0

PLANTS

Sagittaria .. 6d. each
 Vallis Terza .. 6d. "
 Vallis Spiralis .. 6d. "
 Ambolia .. 6d. "
 Ludwigia .. 6d. "
 Hydrangea .. 6d. "
 Cryptocoryne .. 2/- & 3/-
 Wisteria .. 1/6 & 2/-
 Giant Hydrangea .. 1/6 & 2/-
 By post, add 1/6d. Minimum 7/6d.

HEATERS 25w to 200w

Inter-Pet .. 18/6
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 P.S. Standard .. 7/6

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Palmatochromis Kribiaensis 7/6 & 10/- each
 Elephant Nose Fish .. 20/-, 25/-, 30/-
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 Black Cardinal .. 7/6 each
 Scum from .. 7/6 to 20/-
 Ammonia Cats .. 5/- & 7/6
 Malayan Angeli .. 7/6 to 15/-
 Black Veil Angeli .. 6/- & 7/6
 Tin Eel Barbs 2" - 4" - 5" .. 6/-, 7/6, 15/-
 Silversharks 2" - 5" .. 20/-, 25/-, 30/-
 Firmouth .. 4/-
 Red Veined Guppy .. 10/- & 15/- pair
 Red Tail Sharks 2" - & 10/- .. Large 15/- each
 Butterfly Fish .. 6/6 & 10/-

Our minimum order for fishes is £1, a charge of 15/- is made for container. Carriage charges, by fast passenger train and telegram stating time of arrival. Give phone number if possible.

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STOCK SIZES
 24 x 12 x 15 .. £5 5 6
 18 x 10 x 12 .. £2 9 8
 White or black covers .. 18/6 & 25/-
 Larger sizes on quotation

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(Light Gauge) (Angle Iron)
 12 x 6 x 6 .. 10/6 24 x 12 x 12 .. 52/-
 10 x 6 x 6 .. 10/6 24 x 12 x 15 .. 60/-
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 14 x 8 x 8 .. 17/6 30 x 12 x 15 .. 67/6
 18 x 10 x 10 .. 23/6 48 x 12 x 15 .. 130/-

COVERS

18 x 10 .. 10/- 18 x 10 x 30 .. 25/-
 24 x 12 .. 20/- 24 x 12 x 36 .. 30/-
 30 x 12 .. 22/6 30 x 12 x 36 .. 35/-
 36 x 12 .. 27/6 36 x 12 x 36 .. 60/-

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

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Battle Flakes .. 1/6
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 Infusyl .. 2/6
 Elite .. 2/6 C.W. 2/- & 5/-
 Hobby .. 2/- & 3/-
 McLyons .. 1/6, 2/6, 4/6, 12/6
 Brine Shrimp .. 2/-
 Tetra Min Growth Food (Hatched) .. 4/-
 Wardley's .. 8/-, 4/6, 2/6, 2/6, 1/6
 Fantasy .. 2/-
 Tetra Min .. 1/10, 3/-, 6/6, 22/6, 30/-
 Sargrow .. 1/6, 2/6
 Viscraft .. 1/10 & 6/6
 Shoal .. 2/- & 4/6

Add 1/- up to 10/-; 1/6 up to 20/-; 2/- up to £1; 3/- up to £2; over Free
 CARRIAGE AT COST CHARGED ON AQUARIUMS, STANDS, AND TANKS. SENT AT OWNER'S RISK
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for a wide selection of good quality fish
and plants

Open every day 10 a.m. to 6 p.m. Including Bank Holidays

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Aponogeton crispin ..	3/-	Sagittaria Natans ..	6d.	Crypt. Balanar ..	3/6
Aponogeton Undulatum ..	2/6	Sagittaria Gigantes ..	2/-	.. Ciliata ..	3/6
Aponogeton Ulvaceus ..	3/6	Sagittaria Microfolia ..	4d.	.. Cordata ..	3/6
Amazon Chain Sword ..	2/-	Indian Fern ..	2/-	.. Hartoliana ..	2/6
Bacopa ..	6d.	Elodia Densa ..	4d.	Banana Plant ..	4/6
Cabomba ..	6d.	Hydrophylla ..	6d.	Broad Leaf Sword ..	5/6
Ceratophyllum ..	4d.	Twisted Vallis ..	6d.	Radicans ..	10/6 & 12/6
Ludwigia ..	6d.	Portuguese Vallis ..	6d.	Water Orchid ..	4/6
Myriophyllum ..	6d.	Wistaria ..	2/-	Malayan Sword Plant ..	4/6
Cape Fear Spatterdock ..	6/6	Giant Hydrophylla ..	2/-	Madagascar Lace Plant ..	17/6

PLANT PARCEL OFFERS

30 plants for 10/- inc. Water Lettuce

40 plants for 20/- inc. Water Lettuce, 1 Cryptocoryna, 1 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 at address above

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

TROPICALS		TROPICAL OR COLD	
No. 1 50 plants including: Dwarf Lily, Crypsinomyxa, Wisteria etc. £1	No. 5 6 Vallisneria & Myriophyllum & Hydrophilum & Elodea Densa 10/-	No. 17 Giant Amazon Sword Plant 6-8 inches 7/6	
No. 2 12 Vallisneria 12 Myriophyllum 3 Mars Sagittaria 4 Ludwigia & Elodea Densa £1	No. 6 1 Portia Hair Grass 1 Portia Clover 4 Mars Sagittaria 4 Bacopa 10/-	No. 18 Water Lotus Very beautiful plants or 5 for 10/-	
No. 3 12 Vallisneria 4 Myriophyllum 4 Ludwigia 4 Elodea Densa 4 Bacopa 1 Amazon Chain Sword 1 Portia Hair Grass £1	Cultures of pure Infusoria for your Fry 5/-	No. 19 Water Hyacinth 4-6 inches Floating Plant 7/6	
No. 4 1 Nymphae Stellata 1 Giant Hydrophila 1 Agonostemon 1 Wisteria 1 Mars Sagittaria 1 Crypsinomyxa 1 Indian Fern 1 Portia Hair Grass £1	AQUARIUM OR POND	No. 20 Spatterdock 3/6	
	No. 14 12 Sagittaria 8 Pteriophyllum 4 Ludwigia 4 Moneywort 4 Hornwort 1 Portia Root 3 Portia Hair Grass £1	No. 21 10 large bunches of oxygenating plants for your pond £1	
	No. 15 50 Plants for your Aquarium—Value 20/- £1	No. 22 Selection of oxygenating plants & Marginals Value 25/- £1	
	No. 16 6 Vallisneria & Moneywort & Elodea Densa 3 Hornwort 3 Portia Hair Grass 10/-	Live Daphnia 2/- Tubifex 1/6 2/6 Microworm 3/- Whiteworm (Post Free) 3/- Pond Snails 6d. ea.	

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.* MISS EDWARDS, HIGH WYCOMBE
- * *Now I have been I shall certainly come again.* MRS. MARSHALL, SLOUGH
- * *It reminds me of a film set.* MR. ALLARD, CHISWICK
- * *I have enjoyed myself so much.* MR. BROOKFIELD, REUSILE
- * *What a beautiful place.* MRS. THOMPSON, KING'S 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.

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 in our showrooms. If by our call and let us quote.

BOW AQUARIUMS

36in. x 12in. = 15in. bow-fronted aquarium with wrought iron bookcase stand £19/19/- complete.

48in. x 12in. = 15in. — 29 gu.

Prissy bronze, black & gold, and cream. Also plain stands

STANDS

18 x 10 x 36 — 37/6
24 x 12 x 36 — 47/6
30 x 12 x 36 — 52/6
36 x 12 x 36 — 57/6
48 x 12 x 36 — 67/6

BACKING PAPERS

SEA & SHORE
BLUE SKYS

SAND & SHELLS
24in. long x 20in. high, 2/6 per sheet, or 1/3 per foot. (post free)

Please add 1/6 extra postage on appliance orders up to 10/-; 2/- up to 20/-; 2/6 up to 30/-.

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9 a.m.—4.30 p.m. CLOSED THUR.

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Sundays and Thursdays only
from 10 a.m. to 4 p.m.

16 PICTON PLACE,
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The AQUARIST AND PONDKEEPER

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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 so 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-sighted, alert and nervous fish (though it is easily tamed in captivity) 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, gentles 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

Continued at foot of next page

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 plant to propagate itself or can propagate the plant 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 fertilizer 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 1 in. to 1 1/2 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*, *Blasia*, *Cabomba*, *Bacopa* and *Ludwigia*.

Many other aquatic plants produce their young on 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*, *Eleocharis* (hair grass), *Cryptocoryne*, *Echinodorus* (Amazon sword plant), *Sagittaria* and *Marattia* (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 swords.

Indian fern (*Ceratopteris thalictroides*) 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 duckweeds do not need to be propagated as they soon cover the water surface without any assistance.

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



These 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 thicket 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 9d, 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 fishes 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. Sautéed, 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 appetizing 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 chevendon, from the French word *chef*, 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.

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 sun 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 hooftracks 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 mottled 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.



A hard transparent plastic box forms a suitable container for hatching killifish eggs



Pair of *Rivulus milesi* female above, male below

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 1/4 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.

On 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 a



Killifish 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 sardines 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 approx. 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 corks 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 draughts 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 Killifish Association

THE British Killifish Association can introduce you to this 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 Killifish 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 killifish 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 killifish species, tooth-carps as they are sometimes

called, are beginners' fish and need no greater care than ordinary tropical fish whilst others will provide an unqualified 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 subscription 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, Tipton, Staffs.

Centenary Celebrations

THIS year The Quckett Microscopical Club celebrated the centenary of its foundation on 7th July, 1865. The title of the Club commemorates the name of John Thomas Quckett, Professor of Histology and Conservator 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*, Quckett 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 world-wide membership. Appropriately, 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 *M. prolifera*, 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 various types of shore life to be found around the Lancashire coast and to do this successfully it has been necessary to keep as many species as possible in aquaria 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 fresh-water 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 tropicals, 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 anemones, 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 anemones 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, and 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 in 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 anemones, some of the more beautiful anemones and a few of the remarkably specialised rock-pool fishes etc.

A hermit crab was soon collected and placed in the aquaria 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 moult successfully in this decrepit 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 containers, the temperature, the salinity, or perhaps a vast volume of water was required to supply them with sufficient air. Yet, in the end, when all these ideas had been investigated, there was no choice but to re-consider 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 succumbed 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 continual and as vigorous aeration as practicable.

2. I could not resist the temptation to include some off-shore species and the temperature must not therefore be allowed to fall much below 50°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 any sudden fluctuations. An adjustable submersible heater-thermostat is the one I have used, which can be adjusted to the low temperature required.

3. I am careful to ensure that no food 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 moult) 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 in reality be slowly dying 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. The value of scavengers is here demonstrated to best advantage because should, say, a mussel die without one noticing, the situation may be saved, whereas without them all the water would have to be replaced at considerable cost, not to mention the inconvenience. (b) Not all marine creatures will live peacefully 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 inmates 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 aquaria, 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 unattractive and I am quite convinced that the specimens are a good deal more comfortable with its presence.

7. I respect 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 in-

evitably 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, though 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 accidentally 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 to 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 these rocks will be thoroughly contaminated and will require a few weeks to soak if they are not to render one's artificial salt 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, more 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.

Coarse 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.

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 pin-pricks 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 arrestingly 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 Sierba 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.

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 their swiftness of motion are salmon and trout. When swimming their fastest, they are capable of at least 23.25 m.p.h. Perch can manage about 10 m.p.h. The tench, 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 stickleback (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.

That some of our tiniest tropicals can move amazingly fast is 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 sluggish 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 13½ ins. of solid timber.

B. Fry

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 visitor 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 (*Plesiosaurus*). 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



—and a special Belle Vue's Aquatic

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

This apparently massive rock escarpment backing the alligator pool is, in fact, hollow and conceals a service passage

is gratefully acknowledged, the Council being specially indebted to the Scottish Marine Biological Association, Millport, for again supplying a valuable collection of specimens for the Aquarium's sea-water tanks.

The most interesting purchase of the year was a group of ten archer fish, but as these were too small for immediate display they are being kept for a time in one of the breeding room tanks. The attractive archer fish has a pointed head and an oblique mouth with the lower jaw prominent, and when hunting it swims near the surface of lagoons and backwaters on the look-out for flies and other insects resting on overhanging plants and rocks. On locating its prey the archer shoots bullets of water from its mouth with surprising accuracy, and the insect when hit falls to the surface, where it is eaten. One of the largest tanks of the entrance hall is being specially adapted to enable this fascinating little species to display its unique mode of hunting.

Sheffield University have a £1,500,000 scheme to extend the Biology and Chemistry Departments. Among the new provisions will be a 50,000 gallon tank for the study of sea-water life, in the Biology Department, and a radioactive suite in the chemistry block.

Visitors to Chessington Zoo will find the Aquarium a

good attraction. I called recently to see the exhibits, but as it was a bit late I did not get much of a chance to look around. My good friend Mr. Frank Graves was not around, as he had been ill, but by the time this comes to press, I do hope he is back at his work.

The collection is representative of both tropical and coldwater fishes and amongst many others include carp-pike, Siamese fighting fish, gouramis, golden orfe, guppies, swordtails, mollies, cichlids and the colourful tetras. Also on show are monitors, gharial, cayman, alligator and iguanas.

Visiting my very good friends Douglas and Carol Petrie at Llanerch Deer Park and Gardens near St. Asaph, North Wales last month, I was surprised to find a vast array of new additions and buildings. Dougie was very busy with the new Aquarium, which will be most attractive when completed. Already there are many varieties of fishes on display. I will give a complete review of this Aquarium later when it is completed, as it was once the old wine cellar, with many of the wine bottles still in place (some containing wine!).

The River Cwyd meanders lazily through the whole estate and provides a glorious picture with its weirs and

Continued on page 85

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 also 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 utilised. 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 angels, swordtails, neon tetras and black mollies are interspersed with such aristocrats and rarities as the sailfins, 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 quaintly shaped fishes as the pinnac, the puffer, the clown, the trigger, the bat 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. Distracting reflections have been minimised by the forward rake of the glass fronts and the dark surface inside the solid barriers.



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 airborne insect food, or like the climbing perch and mudskipper, 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, forest or desert scrub. Such 'monsters' as pythons, box 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 weighs 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. Legge, I learned that many of the coral fishes are supplied to him by the Ceylon Tea Centre. Mr. Legge also tells me that he has just completed a set of picture cards, illustrating the 'Fishes 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.



In the new Belle Vue Aquarium very few of the tanks are of conventional shape. Made of fibre-glass, all are designed to suggest spaciousness, and even the smallest tanks, such as the semi-circular ones pictured here behind the scenes, have side walls so designed that with the refraction produced by water they become invisible when the tanks are full. Cycloramic backgrounds and concealed plumbing are among other built-in features of these tanks.



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 bare 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 aquarium stocked 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 gelius*.

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 as 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 matured 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 (18°C) or thereabouts will cause no deterioration in the fish's health or activity, even if held over a lengthy period.

B. gelius is a hearty eater, and will feed readily on any dried food, white worms, grass larvae and the like, together with all the usual substitutes 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 bunched plants should be anchored to trap the eggs. The plants most suited to this purpose are those having fuzzy or feathery foliage such as *Myriophyllum* or *Lissinophila (Aubullia)*. The tank should be stood close to a window, in a sunny position, or facing 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, and brighter colours 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 shrunken 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-fine dried food, supplemented, if possible, by tablespoonful 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 aeration, 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 zoos 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.).

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 preserved specimens. Splendid marine animals, seals and mammoth fishes from the depths of the Mediterranean Sea are put on show like tawdry 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 calf 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 pampered 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 turples and octopuses; the latter one commonly sees on a plate, or at the end of a fisherman's pike 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 over-elaborate. Plopping 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 café, 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 than the heavily ornamented establishment at Rhodes. Like almost every other institution in Ankara the Zoo is dedicated to Atatürk—the great hero of the Turkish liberation. Its aquarium contains a well presented and representative selection of most of the commoner 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 veiltails. 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 meet 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

our readers

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.



Address letters to The Editor, *The Aquarist*,
The Butts, Half Acre, Brentford, Middlesex

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 humpbacked. Many of them were listless, fins folded, and looking as though they might expire at any minute.

The conditions under which showmen 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. BROOMFIELD,
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. Lenehan as being "a founder member of S.A.S.S." (Society of Aquarists of South Staffordshire).

This is quite incorrect as Mr. M. D. Lenehan is not a founder member of S.A.S.S.

Here, in alphabetical order, is the list of the founder members: Egginton, W., Hammet, P., Nash-Pownaby, 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. Lenehan, 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. HAMMET, M.D.,
Former chairman, Committee of S.A.S.S.,
Walsall, Staffs.

Aquarist's Notebook

continued from the opposite page

endured 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. Mine commenced 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 resents being offered anything smaller than garden worms, and will seize and gulp down two or three quite large worms a day. This is surely 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-29th NOVEMBER, 1965

Schedule covers all classes as in 1964
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The AQUARIST Crossword

Compiled by M. W. SAUNDERS



CLUES ACROSS

1. *Barbat nigrifasciata* (2-4).
2. Does this fish change colour in autumn? (4).
3. Like an eye (4).
4. Enormous plant growth resulting in weighty problem (10).
5. To hold back water (3).
6. These might be a pun on it (4).
7. Look—y (trout) (3).
8. Type of lettuce (3).
9. You can go up it (3).
10. Might his head be in the clouds? (3-4).
11. A means of propulsion (3).
12. The snake goes round the pier (3).
13. Shadow (5).
14. My French friend (3).
15. Fish part that may be soft (3).
16. Do fish actually live here? (4-3).
17. On which a tank may sit (5).
18. The whole (3).
19. The car turns part of a circle (3).
20. Where goldfish are they tread with safety (4).
21. Flows away—if conditions are not right (3).
22. Think you understand? (3-3-4).
23. River (4).
24. Kim or Oy (4).
25. *Hemiprasone erythronema* (10).

CLUES DOWN

1. *Hyphantopygia linnæi* (4-3).
2. *Stenobothris* (3).
3. Around the moon for lodgings (3).
4. Valuable when half cooked? (4).
5. Westward side (3).
6. Leave us alone (3).
7. Dated to (3).
8. Pond dwelling egg-layer (3).
9. Separated without the ocean (6).
10. Not treated as much (6).
11. Charming ground (4).
12. May carry on the family tradition (1-3).
13. Colchester place (3).
14. Allowing to suit one's requirements (3).
15. This small land mass has been rented (3).
16. An Aquarist term (3).
17. The signal goes round the tank frame (3).
18. This is done on handle and lines (3).
19. Nomen of a fish part (4).
20. Five-a-side football (3).

Solution on page 91



Notes from AQUARISTS' SOCIETIES

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 Cotford A. S. Open Show was very well supported in all 21 classes. There were several classes with over 20 fish each.

The exhibitors were pleased with the arrangements and the fish were handled on show. The judges were able to commence and finish on schedule and this allowed plenty of time to view the show before prize giving. It was noted that medals were presented in record time this being very unusual at an Open Show staged by an individual club these days.

The Cotford A. S. wish to thank all clubs and individuals for the wonderful support given to the show.

A SOCIAL evening was held by Blackpool and Fylde recently and 74 members from Accrington, Leyce Aquarists and Blackpool attended. A trial three-course dinner was held between the three clubs, each club entering six fish. Accrington being the winners. A slide show hand from Hatfield on "Bristle Storing" helped to make it an outstanding evening, and the ladies social committee topped the evening off with a buffet supper worthy of the occasion.

At the second meeting in May the treasurer, Mr. Ekins, gave a lecture on the basic steps to setting up a tank. This may have been covering old ground for other members but was an excellent lesson for the newer members, and a source of ideas and practical hints for the rest of the club. The Hatfield slide shows that other clubs can learn an excellent evening's entertainment at a reasonable cost in a small club, and if any other club or organization has anything of a similar nature to offer the Blackpool society, would they please contact Mr. G. Howard, 56 Standard Avenue, Blackpool.

ON the 30th May, the South London section of the Fancy Guppy Association was formed. The officers elected were: Chairman, Mr. G. Coker; secretary, Mr. A. Goodwin, of 46 Redriff Lane, Rotherhithe, London, S.E.16.; treasurer, Mr. J. Hill; show secretary, Mr. J. Goodall; assistant show secretary, Mr. P. Summers; F.R.O., Mr. T. Tarnes.

Anyone interested in guppies, characins or tetras, young or old, will be assured of a warm welcome. Full details can be had from the secretary.

AT recent meetings of the Hemsworth and District A.S. two interesting talks were given by Mr. Jessop, one on the setting up of a tropical aquarium and the other on the keeping of marine aquaria. One important item mentioned was that freshwater aquarists are not as difficult to maintain as some aquarists believe.

The Hemsworth A.S. was the honoured aquatic section held at the annual Chelsea open show; they were also runners up to the Cotford A.S. for the club highest points, the Chelsea A.S. being third. In other classes of the Chelsea show, individual members of the Hemsworth A.S. did very well, winning a number of awards.

At recent club table shows Mr. Shepherd won a pairs show with tiger barbs, Mr. Scott won an "Any Other Variety" show with a rainbowfish. Mr. Saunders won a "Labyrinth Show" with an ornate gourami and Master Chris Smith won a pairs show with a chequered barb. The Hemsworth A.S. held their second annual open show on Saturday, 28th August at the Chaworth

Schools, Heath Road, Hemsworth, entry forms may be obtained from Mr. L. J. Woodward, 18 Ellerslie Road, Hemsworth.

AT a recent meeting of the Thoresby A.C., the chairman, Mr. H. Nicholls, gave a very informative talk on breeding the bubble-nosers. This included a number of interesting experiences of his own.

At the following meeting the hon. secretary, Mr. P. Sowells, ran a crossword taken from an early *Aquarist*. Also there was a table show for catfish which resulted as follows: 1. D. Durmit, *spilopterus nigrovittatus* (34 points); 2. D. Durmit, *corydoras anurus* (33 points); 3. R. Nichol, *corydoras paleatus* (31 points).

THE Newcastle Guppy and Livebearer Society held its bi-annual fish show which was well supported. There were 25 lots, which were judged by Mr. Stan Fox, the results being as follows: A.V. male guppy: 1. D. Chiswick 2 and 3, W. G. Cummings. Guppies breeding pairs: 1. R. King 2 and 3, D. Pomeroy. Breeding class A.V. livebearer: 1. J. Read 2, W. G. Cummings; 3. N. Little. Breeding pairs, A.O.V. livebearer: 1. J. Read 2, N. Little; 3. W. Cummings. A.V. mollie: 1. N. Little; 2. D. Pomeroy; 3. R. Kirkpatrick. Guppies, 2 matched males: 1. J. Read 2, W. G. Cummings. Swords A.V.: 1. W. G. Cummings; 2. N. Little; 3. D. Pomeroy. Platy A.V.: 1 and 2, R. Kirkpatrick; 3. J. Read. Pseudorasbora: 1. J. Read; 2. N. Little; 3. D. Pomeroy. Best fish in show, J. Read.

Anyone interested in the society should contact Mr. R. Skyles, Chairman, 189 Fawcett, Walkergate, Newcastle-upon-Tyne, 6.

AT an early June meeting the Worcester A.S. who have become a member of the M.A.A.S., were given an address of welcome to the M.A.A.S. by Mr. Atwell, who followed with a lecture on tropical fish keeping, the lecture touching on many aspects of the hobby. This was followed by a table show, for any pair of fish, the result being 1. Mr. Justice; 2. Mr. Fallowell; and joint 3. Mrs. Haines and Mr. Haden.

One of the activities being undertaken by the society is the installation of a community tank in the Worcester public library, whose cooperation in the venture is greatly appreciated by the society. Future activities include an exhibition of tanks at the Deanech annual flower show, and a trip to Nottingham for the open show on 12th September.

THE speaker for the month at the Nottingham and District A.S. meeting was Mr. Hiddle, the subject was breeding egg-layers. At usual the evening was very enjoyable to all present. Three new members were introduced to the company and the vote of thanks to Mr. Hiddle was given by a new member, Mr. Kyle. The table show for characins under 7 in. resulted as follows: 1 and 2, Mr. T. Gaskin; 3, Mr. E. Eiler. Characins over 7 in.: 1 and 2, Mrs. H. Chambers.

THE annual general meeting of the Leigh A.S. was held recently and the following officers and officials were appointed: Chairman, Mr. R. Hildard; vice-chairman, Mr. W. Pooler; secre-

ary, Mr. F. Coward; treasurer, Mr. L. A. Post; show secretary, Mr. D. Redford; librarian, Mr. G. Apey; assistant secretary, Mr. T. Matthias. Also two members were elected to serve as delegates at the F.N.A.S. when the application to join is accepted. The Leigh society has 37 members and meetings are held bi-monthly at the Redway Hotel, East Road Street, Leigh, on Thursday nights at 8 p.m. New members will be made welcome, and should write or contact the secretary, Mr. F. Coward, 22 Redway Street, Lawton St. Marys, 12, Warrington, if further details are required. The society is keen to get into contact with other societies in the Manchester area with a view to arranging table shows.

THE annual general meeting of the Fancy Guppy Association was held recently in Manchester, and it is very pleasing to report that members from as far as Glasgow in the north and London in the south made the journey to voice their opinions on the various motions which were on the agenda.

The meeting officers: Treasurer, Mr. J. Allen; show secretary, Mr. P. Campbell; and secretary, Mr. R. Barstow, 99 Valley Road, Ardren Park, Huddersfield, Cheshire, were re-elected unopposed. In presenting his balance sheet, the treasurer drew members' attention to the healthy state of the association funds and also to the numbers of new members who had joined the association during the year.

The revised standard handbook had been very favourably received, and the secretary informed members that copies were available from him, price 3s., post free. The table show held during the meeting attracted a very good number of visitors (60) and the gold medal for the highest pointed entry went to one of the junior members, H. Stewart.

THE results of the Brighton and Southern A.S. second open show were as follows: A.V. pair: 1. B. F. Baker (Uxbridge A.S.); 2. J. Miller (Chelsea A.S.); 3. L. Stewart (London Transport A.S.); 4. C. Ward (Brighton & S.A.S.); A.V. swordtail: 1. C. Ward (Brighton & S.A.S.); 2. L. Stewart (London Transport A.S.); 3. Mrs. V. Hurley (Brighton); 4. G. Fellman (Clapham A.S.). A.V. mollie: 1. Mrs. P. Bone; 2. J. Stewart (London Transport A.S.); 3. S. G. Moseley (Tottenham A.S.); 4. C. Ward (Brighton A.S.). A.V. male guppy: 1. W. Eades (Lansington Sea A.S.); 2. G. Hastings (Hampstead A.S.); 3. Mrs. P. Bone; 4. R. Keeping (Basingstoke A.S.). A.V. female guppy: 1. R. Ferras-Jones (Basingstoke A.S.); 2 and 3, W. R. Sherwin (Willesden A.S.); 4. R. Sarges (F.G.A.). A.O.V. livebearer: 1, 2 and 3, R. Cooper (Kingston A.S.). A.V. characin: 1 and 2, Mrs. P. Bone; 2. J. Miller (Chelsea A.S.); 4. Y. P. Vowsey (Basingstoke). A.V. barb: 1. D. Ravelle (Brighton & S.A.S.); 2. C. Ward (Brighton); 3. D. Randall (Brighton); 4. R. F. Baker (Uxbridge A.S.). Dario carp swordtail: 1. Mrs. P. Bone; 2. R. Tilley (Brighton & S.A.S.); 3. Y. P. Vowsey (Basingstoke A.S.); 4. R. Keeping (Basingstoke). Rishota: 1. A. G. Hart (Clapham A.S.); 2. J. Coleman (Brighton & S.A.S.); 3. C. E. Greenhalf (Kingston A.S.); 4. N. Franklin (Portsmouth A.S.). A.V. fighter: 1. C. Ward (Brighton & S.A.S.); 2. L. P. Clements (Tottenham A.S.); 3. G. Moseley (Tottenham A.S.); 4. P. J. Lobb (Tottenham A.S.). A.O.V. hybrid: 1. Mrs. P. Bone; 2. C. Ward (Brighton); 3. D. W. Ellis (Kingston A.S.); 4. C. E. Greenhalf (Kingston A.S.). A.V. goldfish: 1. J. P. Clements (Tottenham); 2. D. W. Ellis (Kingston); 3. N. Franklin (Portsmouth A.S.); 4. Mrs. P. Bone. Dwarf delfin: 1. D. W. Ellis (Kingston A.S.); 2. B. Baker (Uxbridge A.S.); 3 and 4, Mrs. P. Bone. A.O.V. cichlid: 1. C. Ward (Brighton & S.A.S.); 2 and 3, G. Fellman (Clapham A.S.); 4. S. G. Moseley (Tottenham A.S.). Corydoras: 1. L. J. Clements (Tottenham A.S.); 2. D. W. Ellis (Kingston A.S.); 3. Mrs. V. Hurley (Brighton & S.A.S.); 4. Mrs. P. Bone. A.O.V. tropical catfish: 1 and 2, D. W. Ellis (Kingston A.S.); 3. Mrs. P. Bone; 4. V. P. Vowsey (Basingstoke A.S.). A.O.V. tropical eel: 1. Mrs. P. Bone; 2. Mr. Kestley; 3. G. Jennings (Hampstead A.S.); 4. E. Cummings (Brighton & S.A.S.). Tropical breeders livebearers: 1.

I. E. Hous (Mildenhall A.S.); 2 and 3, R. Baker (Uxbridge A.S.); 4, J. Sorraet, L.T.E. Tropical breeders' agglutinates: 1 and 2, A. G. Hart (Clapham A.S.); 3, R. Ebdon (Tottenham A.S.); 4, R. Keopig (Bastings A.S.). Common goldfish: 1, Mr. Saurin (Portsmouth A.S.); 2 and 3, Miss W. G. Ryder (Portsmouth A.S.); 4, G. Felerman (Clapham A.S.). A.V. shubunkin: 1 and 4, R. Barrett-Jones (Bastings A.S.); 2, Mr. Saurin (Portsmouth A.S.); 3, G. Bunde (Tottenham A.S.). A.O.V. fancy goldfish: 1, L. P. Giovanni (Tottenham A.S.); 2, R. D. Jones; 3 and 4, Mr. Saurin (Portsmouth A.S.). A.V. river and pond: 1 and 3, Mr. Saurin (Portsmouth A.S.); 2, W. E. Sherwin (Willesden A.S.); 4, V. B. Hart (Portsmouth A.S.). Best fish of the show award: F.R.A.S. Trophy, and gift voucher kindly donated by Conrad A. Dowding, Agamst, of Lewes, Sussex. Winner: Mrs. P. Ross, banded kribia fish.

Approximately 200 entries were received, this being a considerable increase over last year's, and the Secretary would like to thank all those who took part in the show.

THE Portsmouth A.S. held a table show for characins and cichlids at the Community Centre. The judge was Mr. J. Sorraet of London. The results were as follows: Cichlids: 1 and 2, Mr. E. Warren; 3, Mr. C. Tyler; 4, Mr. E. Warren. Characins: 1, Master P. Carlton; 2, Mr. Shill; 3 and 4, Master P. Carlton.

RECENT table show results and placings from Headford and District A.S. are as follows: Cichlids: 1, Mr. J. Hooper; 2 and 3, Mrs. M. Birch. Table show placings: 1, Mr. J. R. Smith, 12 pts.; 2, Mr. H. Greenwood, 11 pts.; 3, Mr. A. W. Griggs, 11 pts.; 4, Mr. C. Holdsworth, 10 pts.; 5, Mr. K. Emma, 10 pts.; 6, Mr. J. Hooper, 10 pts.

The Society has also had a talk from Mr. K. Barncrough on marine tropic fish. The Society meet on the first Wednesday of every month at Under Hall, Ryeview Square, Bradford, and the secretary is Mr. D. Carr, 42 St. Paul's Road, Shipley.

PETITBLEE and District A.S. acted as hosts to societies from Borden, Southern and Houghton in a first annual challenge match of a contest to find the top society in the North-East Federation.

The home society came out on top with four points, Southern and Houghton tying for second place with three points each and Borden had one point.

A vase, owned by Mr. J. Bishop, of Petritblee, was judged the best fish in the show.

AT the monthly meeting of the Aireborough and District A.S. talks were given on the subject of types and culture of the various live foods and foods for fry and young fish, by two of the members, Mr. Walker and Mr. Myers. The special class for the month was cichlid which was won by Mr. Lancaster, Mr. Chadwick being second and third Mrs. Dickenson. The A.O.V. class was a clean sweep for Mrs. Helm, who took first three places. The novice class was won by Mrs. Dickenson, second being Miss Warburton and third Mr. Lancaster. Coming events include inter-club shows with Bradford and Patefract.

RECENTLY a meeting of the South London Section of the F.O.A. was held at the Star & Garter P.B., Deptford Broadway, Deptford, London, S.E.8. It was decided that this will be the regular meeting place, every fourth Sunday of the month.

Whilst the table show was being judged, a talk was given by Mr. G. Goodall on showing guppies under F.O.A. rules, the different class, how points are allotted, what the judges look for in a guppy. The talk was of great interest and most helpful to the newer members. Results of the table show were as follows: Delta males—1, P. Baker (76 pts.); 2, G. Goodall (74 pts.). Vetical males—1, Master J. Goodall (78 pts.); 2, A. Park (72 pts.); 3, T. Hibbert (70 pts.). A.O.V. male—1, A. Jamson (71 pts.); 2, Master J. Goodall (70 pts.).

A.O.V. female—1, G. Goodall (71 pts.); 2, A. Jamson (72 pts.); 3, H. Harris (72 pts.). Breeders—1, A. Park (72 pts.); 2, P. Summers (72 pts.); 3, A. Jamson (72 pts.). Breeders pairs—1, P. Summers (72 pts.); 2, H. Harris (71 pts.); 3, G. Goodall (69 pts.).

Silver stars were won by P. Baker, Master J. Goodall, and A. Park.

Any new members can be assured of a warm welcome.

THE June meeting of the Dander A.S. was well attended and the fine table show of the season was for the first time—Characins A, B and C. The entries were judged by P. N. Greening and the results were as follows: Characins, A—1, Miss E. Davidson; 2, J. McGoogale; 3 and 4, A. I. Hault, Characins B—1, A. Ingh; 2, J. Pridd; 3, J. McGoogale; Characins C—1, Miss E. Davidson; 2, A. I. Hault; 3, J. McGoogale. The programme which followed was from the Northern Inland Federation and consisted of slides and a commentary on "Killin". The classes for the table show for August and September will be respectively Swedish and Barb A and B in August and Cichlids in September.

The members of the Chapeltown and District A.S. were entertained by a private slideshow at their June Meeting, the corner of the slides giving a commentary on types of fish and places and location of slides. This was thoroughly enjoyed as most members were familiar with the tanks employed in the commentary. The results of the two table shows were: Eggplant (toothpick): 1, Arthur Hunt; 2, Stewart Barnshaw; 3, John Tunney. Cichlids: 1, Morris John Harding; 2, and 3, Arthur Hunt. The meeting night has been chosen from the fourth Thursday of the month to the last Friday in each month. Any new members would be made welcome, and for further information should contact the secretary, Mr. R. Curtis, 42 Burncross Road, Chapeltown, Nr. Sheffield.

NEW SOCIETIES

A SOCIETY has been formed at Stockton and this will be known as the Stockton-on-Tees A.S. (S.T.A.S.). Meetings will be held every third week, the first commenced the 12th July, and was held in the Green Tree Hotel, Ramsgate. Anyone interested in the hobby is invited to attend these meetings and is sure of a warm welcome. The secretary is Mr. J. Williamson, 30 George Road, Norton, Stockton-on-Tees.

FIRST chairman of the recently-formed Tropical Fish Society of Essex is Mr. Ronald Gerrick, of Chatter Road, Whittby, with Mr. B. Bousfield, of 7 Mansfield Road, as secretary and treasurer.

The Society has about 15 members at present, but in view of the increasing interest in the keeping of tropical fish it is expected that this number will soon rise. Meetings will be held on the first and third Mondays of each month at the Woodland Hotel, commencing at 8 p.m., and anyone interested is invited to attend.

Film shows and lectures by people prominent in the fish-keeping world will be arranged in due course, and it is hoped to arrange visits to other similar Societies.

A NEW society has been formed at South Kirby, Yorkshire. The name is the South Kirby and District A.S. and the officials are as follows: President, A. J. Millic; Chairman, E. Piper; Treasurer, M. Barr; Secretary, E. Piper; 42, Minsterhope Lane, South Elmsall, Patefract, Yorkshire.

A NEW society has been formed at Garforth, Leeds, known as the Garforth and District A.S. The officers of the society are as follows: Chairman, Mr. Bob Moss, vice chairman, Mr. Robert Clarke (Tel. Garforth 2931); treasurer, Mr. Paul Clarke (Tel. Garforth 2931); show secretary, Mr. G. Deacott; secretary, Mr. R. Davis, 55 Dryden Avenue, Garforth (Tel. Garforth 2827). The society will meet on the

third Wednesday of every month at Barley Hill Road Secondary Modern School, Garforth at 7.30 p.m. The first annual meeting will be on 15th September. Application forms for membership can be obtained from the secretary.

THE open show of the Bath A.S. was held recently. It was the first show of its kind held in Bath and it is hoped to make this an annual event. The results were as follows: Guppies: 1, Mr. D. Lovgrove; 2 and 3, Mr. Court; 4, Mr. Wheeler. Livebearers: 1, Mr. Wheeler; 2, Mr. Mappin; 3, Mr. F. Brown; 4, Mr. T. Callow. Hexagrammum and Hyphessobrycon: 1, Mr. R. A. Short; 2, Mr. Hasky; 3, Mr. Overmont; 4, Mr. P. Brown. A.O.V. Characins: 1 and 3, Mr. Hasky; 2, Mr. F. Brown; 4, Mr. Mappin. Fishers: 1, 2 and 4, Mr. Carr; 3, Mr. Mappin. Labyrinth: 1, Mr. Wheeler; 2, Mr. Carr; 3, Mr. T. Callow; 4, Mr. F. Brown. Barb: 1, 2 and 4, Mr. F. Brown; 3, Mr. Quick. Large Cichlids: 1 and 4, Mr. T. Callow; 2 and 3, Mr. Mappin. Dwarf Cichlids: 1, Mr. Mappin; 2, Mr. Carr; 3 and 4, Mr. D. Lovgrove. Barbos and Danios: 1, Mr. Viny; 2, Mr. D. Lovgrove; 3, Mr. Quick; 4, Mr. F. Brown. Catfish and loaches: 1 and 2, Mr. F. Brown; 3, Mr. Peyster; 4, Mr. Wheeler. A.O.V. Topicals: 1, Mr. Harker; 2, Mr. Mappin; 3 and 4, Mr. Harker. The trophy for best fish in show was won by Mr. Wheeler with a dwarf guppy. The award for the highest number of points went to Mr. F. Brown.

AT the first annual general meeting of the Cardiff A.S. the following committee was elected: Chairman, Mr. J. Breen; secretary, Mr. N. J. Coonall; treasurer, Mr. G. Tucker; show secretary, Mr. N. J. Coonall; club librarian, Mr. P. Bennett. At this meeting a table show was held and the results were as follows:

Breeders, livebearers and eggplants: 1, 2 and 4, Mr. N. J. Coonall (guppies); 3, Mr. E. Gough (royal barb). At another meeting a knockout competition was held and the trophy was donated by Mr. A. D. Lockwood. The results were as follows:

1, Mr. C. W. Gorwill (blue acara); 2 and 4, Mr. N. J. Coonall (guppy); 3, Mr. G. Tucker (zebra cichlid). Meetings are held on the second and fourth Thursdays of each month at the Old Arcade Inn, Church Street, Cardiff, commencing at 8.00 p.m. Visitors and new members can be assured a warm welcome. Further details can be obtained from the hon. secretary, Mr. N. J. Coonall, 29 Llanvethin Road, Cardiff.

AT the last meeting before the summer recess of the Thurrock Aquarist Club, the chairman, Mr. R. Nicholls gave a very interesting and instructive talk on fish enemies. He pointed out the dangers of these being introduced into aquaria's tanks by feeding pond caught Labeo etc.

The club congratulates Mr. R. Nicholls and Mr. Durrant on their recent successes in the Dagenham Town show. Mr. R. Nicholls gaining first and best fish in show in cichlid class; first in A.O.V. livebearer; second in Danios, rainbow and minnow; third in dwarf cichlid; fourth in Characins; also fourth in moths and A.O.V. classes. Mr. Durrant gained first in furnished aquaria; first in breeders' agglutinates; first in tropical catfish; first in exocentris and plastic; second and third in A.O.V. livebearers and fourth in breeders' livebearers.

Congratulations are also extended to Mr. Brian Barber who on his first entry into an open show, and with only one entry gained a second in the characin class at the Dagenham Town Show town show.

The club meet on alternate Mondays at Gypsy Lane Hall, Greys, the first meeting after the summer recess being on 15th September, when the chairman will give a talk on plant propagation. There will also be a table show for baths. New members can be assured a warm welcome.

FOLLOWING a very interesting talk last July on live food cultures by Mr. Arnold, members of the Independent A.S. took this opportunity

to re-stock their existing cultures, and also the vice tabled new fish members to purchase Goldfish, Mice and White worms etc. at very reasonable prices.

The following week the club held a best pairs competition (male and female fish) and these were judged by Mr. F. Tordina the club chairman. The winner on this night was Miss A. Kamie (Red Lion), second, Mr. J. Rooke (black mollies), third, Mr. R. White (nigger barbs) and fourth, Mrs. Rowell (nigger barbs).

The programme for the coming month includes lectures on cichlids, W. C. M. Minnows and water conditions, vacuum table shows and bridge during September. For details: Phone ABC 0804 (evenings). New members are assured of a warm welcome and an enjoyable evening.

AT recent meetings of the **Horslow and District A.S.**, table shows have been held for overboarders and pairs. The shows were won by Mr. Shepherd (guppy) and Mr. Perry (speaking guppies), these shows are now a very popular feature of the society which is still increasing its membership. At recent open shows the Horslow club members have done very well by winning many awards at Uxbridge, Basingstoke, Crawley and a number of others. At a meeting in July a "Criss Cross Quiz" on fishkeeping proved very popular with a large attendance. The meetings of the society are now held fortnightly on Wednesdays of the Territorial Army Centre, Harworth Road, Horslow. The secretary is Mr. D. J. Woodhead, 26, Ellerslie Road, Horslow, Middlesex.

THE first meeting of the month for the **Blackpool and Fylde A.S.** saw the members rallying around to help the club secretary with the aid of an auction. This was run by Mr. Williams the vice chairman, and will help to pay for many more entertaining lectures and shows. The second meeting, and Mr. Hadley, his year's winner of Belle Vue's Guppy Trophy giving a demonstration on how to set up a prize-winning furnished aquarium. In an interesting step by step arrangement, the empty tank slowly took shape into what many a beginner and come to think, quite a few old hands would like to do every time they set up themselves. The use of a mirror slightly angled and branches of old trees will add to water were just a couple of the many tips that were useful.

The Club's fifteenth Open Table show will be held on Sunday, 28th September at the Parson School at Lancing, 47, Station Road, Blackpool. There will be 19 trophies to be competed for and a book for Best fish in show. All enquiries to the Show Sec., Mr. J. Taylor, 32, Westley Avenue, Blackpool.

DURING the summer months of July and August, the **Worcester A.S.** decided to reduce the number of meetings, due to members being away on holiday and normal meeting times will resume on 2nd September.

The Society is staging a display at the Devonish Flower Show, on 16th August, mainly to recruit new members and to promote the hobby generally. It will take the form of a set piece consisting 4 1/2 in. by 8 in. by 10 in. tanks, in which four different varieties of tropical fish are to be displayed. This will be set off with a smaller community tank 24 in. by 12 in. by 15 in. on a stand. Purse activities during September include:—2nd September, Lecture on breeding; 12th September, Trips to Nottingham; 16th September, Inter-Society Quiz with Cheltenham Society as guests.

THE results of the June meeting table show of the **New Forest A.S.** were as follows—A. V. Guppy: 1, 2 and 3, Mrs. Davies, A. V. swordtail: 1, Mr. D. Harding; 2, Mr. D. Lewis; 3, Mrs. Blake. In July the Society held an Exhibition at the Illing Fair, Totton. Members set up standard club tanks for both Coldwater and Tropical Furnished Aquaria and their efforts were judged by Mr. Ron Masley of Bourne-mouth. The results were as follows—Coldwater furnished aquaria: 1, E. Howarth; 2, A. Williamson; 3, Mrs. Blake. Tropical furnished aquaria: 1, A. Williamson; 2, D. Lewis; 3, D. Harding.

THE annual general meeting of the **Chester and District A.S.** was held recently and the officers elected were: President, Mr. G. S. Monaghan; chairman, Mr. L. Moulding; hon. secretary, Mr. P. R. Millington; treasurer, Mr. R. Needham.

The chairman stated how pleasing it was to receive the continued patronage of Mr. Mottershead. The increasing interest in the hobby had been happily reflected in the number of new members welcomed during the year and the programme for the forthcoming meetings had been well received. More than anything the procedure of starting with "Reports from members" had proved an irrevocable aid in getting new members to feel "at home" at the very first visit.

THE first open table of the **Rosestree A.S.** was held recently and the Society was pleased to welcome members from the societies of Burnley, Bradford, Crayke, Derby, Mansfield, Merseyside, Middlesbrough, Nottingham, Oram (Manchester), South, Souths, Switlington, Tadcaster, Thores, Tropical Association, Bradford, Wake House (Leeds), Worktop and York. There were 278 exhibitors and an excellent display and the Association of Yorkshire Aquarist Societies Diploma for the Best Fish in the Show was presented to Mr. G. Grafton (Middlesbrough A.S.) for a Blue Gourami, 88 points. The Worktop Aquarist and Zoological Society won the special incentive plaque for the Society gaining the highest aggregate of points.

The results in the societies competition were as follows—Worktop Aquarist and Zoological Society, 31 pts.; Bradford, 30 pts.; Tropical Association Breeder, 28 pts.; Merseyside, 27 pts.; Middlesbrough, 18 pts.; South, 17 pts.; Crayke, 11 pts.; Thores, 7 pts.; Switlington, 7 pts.; Derby, 6 pts.; Tadcaster, 6 pts.; Wake House, 4 pts. (Byd results: Liverpool: 1, Mrs. M. Pugh (Bradford); 2, Mrs. H. Dornie (Worktop); 3, D. Machin (Thores). Barbs: 1, K. Pook (Merseyside); 2, J. Dornie (Worktop); 3, N. Hooper (Bradford). Characins: 1, D. Carr (Bradford); 2, Mrs. H. M. Smith (Bradford); 3, T. C. Hallam (Derby). Guppies and minnows: 1, M. G. Davis (T.A.B.); 2, N. Burn (Worktop); 3, N. McDougall (Crayke). Apistogramma: 1 and 3, G. Grafton (Middlesbrough); 2, Mrs. H. Dornie (Worktop). Fishnets: 1, M. G. Davis (Tropical Breeders Association); 2, N. Burn (Worktop); 3, A. E. Whitlock (Tadcaster). Goldfish: 1, J. Dornie (Worktop); 2, F. Mulla (Merseyside); 3, S. K. Kouris (Crayke). Catfish and loach (inc. Catfish and Flying Fox): 1, D. Carr (Bradford); 2, F. Mulla (Merseyside); 3, N. Hallam (Derby). Telescope: 1 and 2, R. Davis (Thores); 3, H. Dornie (Worktop). Tropical A.O.V. 1 and 2, M. G. Davis (Tropical Breeders Association); 3, R. Burn (South). Breeders (Livestock): 1 and 2, M. G. Davis (Tropical Breeders Association); 3, Mrs. H. Dornie (Worktop). Breeders (Egg-layers): 1, F. Dunley (South); 2, D. White (Thores); 3, R. M. Paschall (Tadcaster). Ladies A.O.V. Tropical: 1 and 2, Mrs. H. Burn (South); 3, Mrs. C. Holmes (Bradford). Juniors A.O.V. Tropical (16 years of age and under): 1, Master J. Gibson (Crayke); 2, Miss A. Wiggins (White Rose); 3, Master B. Davis (Thores). Goldfish: 1 and 2, L. Booth (Bradford); 3, J. H. Harve (Souths). Mr. Ronald Best, President of the Rosestree A.S. presented the awards.

THE annual show of the **Macclesfield A.S.** will be held on Friday and Saturday, the 10th and 11th September at the Stanley Hall, Stanley Street, Macclesfield. The result of the Aquarist of the Year Table shows was as follows: 1, H. and E. Wilson; 2, F. Mitchell; 3, N. Rogers. This was decided from the monthly Table shows for all classes.

Monthly meetings are held at the Stanley Hall, the first Monday night of each month.

THE results of the Liverpool show featuring the **Merseyside A.S.** were as follows: Furnished aquaria: 1 and Special, Mrs. C. Alunworth; 2, Mr. Jones; 3, Mr. Robinson.

Livestock: Guppies: 1 and Special, Mrs. C. Alunworth; 2, Mr. Mosyford; 3, Mr. Robinson. Fishes: 1 and 2, Mr. Swanson; 3, Mrs. Alunworth. Molluscs: 1, Mr. Swanson; 2, Mr. Turner; 3, Mrs. Chambers. Swordtails: 1, Mr. Turner; 2, Mr. Jones; 3, Mrs. Chambers. Barbs (large): 1 and Special, Mr. Parker; 2, Mr. Parker; 3, Mr. Poole. (small): 1, Mr. Robinson; 2 and 3, Mr. Simkin. Goldfish (large): 1, Mr. Mulla; 2, Miss A. Collings; 3, Mr. Beck. (small): 1 and Special, Mr. Swanson; 2, Mr. Jones; 3, Mr. Swanson. Characins (small): 1 and Special, Mr. Stanger; 2, Mr. Mulla; 3, Mr. Robinson. (large): 1, Mr. Mosyford; 2, Mr. Stanger; 3, Mr. Simkin. Breeders: 1 and Special, Mr. Robinson; 2, Mr. Thomalla; 3, Mr. Stanger. A.O.V. (large): 1 and Special, Mr. Turner; 2, Mr. Thomalla; 3, Mr. Turner; 3, Mr. T. Wain, Sea Top winners: 1 and Special, Mr. Robinson; 2, Mr. Robinson; 3, Mr. Swanson. A.O.V. 1 and Special, Mr. Alunworth; 2, Mr. Parker; 3, Master Parker. Best in show: Mr. Parker. This prize was awarded for a Tinfoil barb and the judge, Mr. Legge, Curator of Belle Vue Aquarium, gave the maximum of 100 points.

AT the annual meeting of the **Liverpool Males A.S.**, the following were elected to office: Chairman, K. Parant; secretary and treasurer, R. Wigg; 1st Hon. Secy, Scott; Liverpool Mayor, Clerk, show secretary, D. Soughmore; Librarian, Mrs. M. Skercher; vice-chairman, A. Robertson. It was decided to change the meeting nights from the second Saturday to the second Tuesday in the month, and new members will always be made welcome.

Aquarist's Calendar

25-28th August: Milland Open Aquatic Show and F.O.B.S. International Open Guppy Show, Rugby Hall, Broad Street, Birmingham 1. Schedules and details from Mr. J. Edwards, 34 Veronica Close, Selly Oak, Birmingham 29.

4th September: Bethnal Green, A.S. Annual Open Show. Details from secretary Mr. D. G. Allan, 16 St. Peters Avenue, Hackney Road, London, E.2.

11-12th September: Nottingham National Open Show. Details from show secretary Mr. W. J. Christian, 20 Beaumont Gardens, Willard Hill, West Bridgford, Nottingham.

24-25th September: Brand A.S. Open Show, Bishopscote Parish Hall, Glasgow Road, Brand, Scotland. Schedules from Mr. V. Cuppitt, 18 Glen Park, St. George, Bristol.

7th October: Scottish Aquarist Society Open Show. Details from Mr. J. Loak, 249 Byres Road, Glasgow, W.2.

Crossword Solution

N	I	G	G	E	R	B	A	R	B	L	E	A	F
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Continued on page 41

PREPAID ADVERTISEMENTS—continued from page 22

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NOTICE

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