The Aquarist

and Pondkeeper

OCTOBER 1966

MONTHLY
Vol. XXXI No. 7

TWO SHILLINGS AND SIXPENCE

WALTER R. SMITH LTD.

For Complete Tropical and Coldwater Aquaria also Tropical Marine

100 Varieties of fish usually in stock on view in 76 polished stainless steel aquariums

POLISHED STAINLESS STEEL	Frames	Aquariums
24 × 15 × 12	£ 7 7 0	£ 10 10 0
30 × 15 × 12	£ 9 9 0	£ 12 12 0
36½ × 15 × 12	£ 11 11 0	£ 14 14 0
48 × 15 × 12	£ 13 13 0	£ 23 2 0

DISTRIBUTOR OF—

- McLYNN'S FISH FOOD
- ES-ES PRODUCTS ELECTRICAL AND GENERAL
- WATER LIFE, AQUARIST, DITCHFIELD'S AND T.F.H. BOOKLETS
- REJECTORS, SEDIJETS, AND MAINTENANCE EQUIPMENT
- PROCKTER, SUMMIT AND STAR PUMPS
- CONSTAT THERMOSTATS
- AQUAFERN AND COLOFERN PRODUCTS
- HYFLO PRODUCTS
- LIVERINE PRODUCTS
- STOKES FOUNTAIN
- WINDMILL PRODUCTS
- ROCK GRAVEL AND STRATA ROCK WORK STUDENTS' MICROSCOPES
- ALL FEEDING AND AERATING APPLIANCES
- MERCURY, SPIRIT AND DUMPY THERMOMETERS
- STUART TURNER WATER PUMPS
- ZOOBEKO AND BIKO PUMPS
- VI-FIT FISH FOOD
- BLACK MAGIC GLAZING COMPOUND
- GLASTICON '303' AQUARIUM SEALER
- AQUAMASTA GLAZING COMPOUND
- LIQUIFRY AND INTER-PET PRODUCTS
- FIBRE GLASS PONDS
- OTTER WATERFALL AND FOUNTAIN KITS

Angle Iron Aquariums, Frames and Stands a speciality. Odd sizes made to order, painted any colour, guaranteed square and free from welds. Stove enamelled Corner Bows, Bow Fronts and Wrought Iron Units.
Half Carriage Paid on these items.

Retail Price List 6d inc. Postage
Wholesale List to Bona-fide Traders on application
Premises closed Sunday and Monday throughout the year

WALTER R. SMITH LTD.
39 Tib Street and 16 Whittle Street
(Off Tib Street)
Manchester 4
Telephones: Deansgate 2961 and 2138

M. & R. (DOG-FISH) LTD.

presents

Over 120 varieties [including] Marine Tropicals on show and for sale. We stock Eheim Filter, Ozonisor, Ozon Reactor, Wisa pumps, Automatic Fish Feeder, Metaframe tanks etc.
And now Gro-Lux tubes in various sizes.
(cannot be sent by post)
466 PAISLEY ROAD WEST, GLASGOW, S.W.1
Telephone: IBROX 3015 Open Sundays 11 a.m.—2 p.m.

Set 'em Elite . . . !

UGH! We apologize for the pun. But we don't apologize for **Elite** fish foods. Why should we? A lifetime's experience of pioneering with aquarium and pond fishes is built into every bumper-size tin (no messy cartons or damp cardboard boxes). Your fish will glow with well-being if fed on **Elite**.

Coldwater — 2s. 6d. a large tin
Tropical — 2s. and 5s. a tin

Trade Agent:
Barry M. Austin,
230 Staines Rd., Twickenham, Middx.

Post Free direct from:
DERHAM'S FISH FOODS LTD.
'Roxton Dene', South Rd., Chorleywood, Herts.
Phone: Chorleywood 2386

the NEW DYNAFLO Motor Filter

Its simplicity is startling—its results extraordinary! This amazing invention will KEEP any aquarium crystal clear.

No gimmicks, no gadget, no valves, no tubing, no diaphragms, no pistons and above all, NO NOISE. Only one moving part silently spinning on a nylon ball performs the miracle.

The filtration and aeration produced by the Dynaflo makes fishkeeping easier for beginners . . . more successful than ever thought possible for the expert.

Perfect for the show tank or the breeding tank.

Why not plug one in—it will be an exciting experience.

Why have Clutter?

The new DYNAFLO does away with:

Air Pump
Air Tubing
Air Controls
Air Filter

NO NOISE!

Price £5-17-6

Another Winner from Liquifry—The manufacturers of specialist fish foods

CHLORELLA MEAL

Based on Chlorella, a single cell green algae which has recently come to light as a space food.

★ Superior in every respect to live foods.
★ Fish love it.
★ Gives Rapid Growth and Good natural coloration.
★ Standard Size 2/6d. retail.
★ Breeders Pack 5/3d. retail.

Available from your dealer or in case of difficulty from:—

INTER-PET 18 Church Street - Dorking - Surrey

DYNAFLO—A NEW CONCEPT IN AQUARIUM KEEPING

AQUARIST MAIL ORDER SERVICE

(Personal shoppers very welcome

it's worth the journey!)

TROPICAL FISH, PLANTS & EQUIPMENT

Available to you wherever you live, send for fish list and catalogue

See us on stand No. 1

(Just inside main entrance)

at the

BRITISH AQUARISTS' FESTIVAL

BELLE VUE MANCHESTER OCT 29th 30th

Where we shall have on sale, fish of all sizes to suit all pockets, plus plants, and all leading equipment.

Demonstrations

Dr. J. N. Carrington will be with us throughout the show and will be pleased to explain any of the **INTER-PET, GROWEL, LIQUIFRY,** or **METAFRAME** products.

Mr. K. Fawcett of TFH Publications will be with us to demonstrate **NEW MIRACLE FREEZE TUBIFEX** and the whole range of TFH books

I personally look forward to this opportunity of meeting all customers old and new.

KEITH BARRACLOUGH, AQUARIST

215 GREAT HORTON ROAD - BRADFORD 7

Telephone: BRADFORD 73372

Half-day closing Wednesday 1 p.m. **Open until 8 p.m. Friday**

SPECIALS FOR OCTOBER

Adult Leeri Gourami	15/- & £1 each	Annectens	5/- each
6"-7" Electric Cats	30/- each	Adult Dwarf Gourami	5/- each
Red Nosed Tetra	5/6 each	Small Discus	35/- each

STOCKISTS OF PLASTOLINE AND JUROLENE PLASTIC SHEETING FOR PONDS

SPECIAL—*FOR TROPICAL TANKS "GROLUX FLUORESCENT TUBE LIGHTING UNITS"*

NEW FILTERS NOW IN STOCK. DYNOFLO MOTOR FILTER £3-17-6 EHEIM COMPACT FILTER 383 £9-12-6 INCLUDING RACK. EHEIM STANDARD £12-15-0 INCLUDING RACK.

"GREEN SHIELD" STAMPS GIVEN (PERSONAL SALES ONLY)

POND FISHES

Golden Orfe 4"-6" 6"-7" ... 10/- & 15/-
5"-7" Higoi Carp ... 2/-, 10/-
Green Tench ... 3/- & 4/-
Large Goldfish 7"-8", 8"-10" 10/- & £1
Small Orfe ... 2/-
Medium Goldfish ... 5/- to 7/6
Small Goldfish & Shus ... 1/6 to 2/6
ALL POND PLANTS STOCKED

THERMOSTATS

each
Silk Star ... 32/-
Constat External ... 30/-
Constat New External Type QK ... 30/-
Wizard External ... 25/-
Inter-Pet ... 20/-, 32/-
UNO
Out/Adj. ... 18/-
Int/Adj. ... 12/-
Int/Adj. "Popular" ... 16/-
"Popular" with neon indicator ... 12/6
Preset Matic ... 24/6
Wizard ... 10/-, 12/6, 15/-

AERATORS

Star ... 32/-
Ex. Schmidt ... 22/-
Quicke ... 22/-
Rena ... 30/-
Montrose Major ... 24/-
Montrose Minor ... 21/-

GARDEN PUMPS

Otter ... £9 17 6
Stokes ... £7 19 6

PISTON PUMPS

Hy-flo Junior New Super ... 107/6
Hy-flo "A" ... 130/-
Hy-flo "B" ... 165/-
Hy-flo "C" ... 250/-

Thermometers

Mercury ... 4/6
Blue Gem ... 5/-
Dummy ... 6/6

Sundries

T Pieces ... 10d.
Clamps ... 1/3
Aeration Tubing 9d. yd.
Siphon Tubing 1/6 yd.
Glass Wool 1/-
Filter Carbon 2/-
Gelamid 2/-
Aquarium cement 2/6
Ex Spot Cure 4/6
[illegible] 3/6
Hobby Spot Cure 5/9

Filters

Gravel Bubble-Up 35/-
Hykro Outside 15/-
Corner ... 4/6
Outside ... 18/6
Windmill Hand Rejector ... 15/-
Windmill Air Rejector ... 16/-
Consort ... 15/6
Premier Bio-logical Sub-Gravel Filters 12/6, 15/-
Sedler ... 8/-
Slim Jim ... 17/6
Kleer King ... 22/6
Bottom Filter 8/3
Rock Filter 17/6

TROPICALS

Neons, 9 for £1 ; 2/6 each

Rasboras ... 4/-
Angels ... 2/6 & 3/6
White Cloud Minnows ... 2/6
Platies ... 2/6
Beacons ... 3/6
Black Widows ... 2/6
Platys various, from 2/6
Swordtails various, from 3/-
Schuberti barbs ... 3/-
Scissortails ... 3/-
Guppies (pair) 1/6, 3/-
Harlequins ... 3/-
Cherry barbs ... 3/-
Nigger barbs ... 3/-
Chequer barbs ... 3/-
Red Eyed Tetra ... 3/-
Plecostomus 10/-, 15/-
Large Green Sailfin Mollies ... from 8/-
Black Angels ... 6/- 7/6
Black Lace Angels 4/- to 7/6
Tiger barbs 2/6 & 3/6
Glowlights ... 3/-
Penguins ... (each) 3/9
Bumble Bees ... (each) 3/9
Mollies, Black from ... 3/6 & 5/-
Lemon tetras ... 4/-
Glassfish Adult ... 4/6
Aeneus Cats ... 7/6
Ocellinus Cats ... 7/6
Fighters ... 10/-, 12/6
Serpae ... 4/-

Thick lip 3/-, dwarf or leeri 3/6, Kissing 4/-, Opaline 3/6, Gouramis.

"SWIRL-AWAY"

Aquarium Vacuum Cleaner ... 46/8
Super Model ... 56/8

EHEIM FILTERS STOCKED

BOOK CASE BOW-FRONTED AQUARIUM

48 × 10 × 15 ... £35 10 0
36 × 12 × 15 ... £24 10 0
Standard Bow £25, £17, £13 0 0

PLANTS

Sagittaria ... from 6d. each
Vallis. Torta ... „ 6d. „
Vallis. Spiralis ... „ 6d. „
Ambulia ... „ 6d. „
Ludwigia ... „ 6d. „
Hygrophila ... „ 6d. „
Cryptocoryne ... „ 2/- & 2/-
Wisteria ... „ 1/6 & 2/-
Giant Hygrophila ... „ 1/6 & 2/-

By post, add 1/6d. Minimum 7/6d.

HEATERS 25w to 200w

Uno & Wizard ... 8/6
F.S. Standard ... 7/6

ADULT RARE FISHES

Pelmatochromis Kribensis ... 7/6 & 10/- each
Discus ... £2 each
Large Sailfin Green Mollie ... £1 each
Anostomus ... 20/-, 25/-
Pel. Annectens ... 5/-
Black Cardinal ... 4/6 each
Scats from ... 7/6 to 20/-
Armoured Cats ... 5/- & 7/6
Malayan Angels ... 7/6 to 15/-
Black Veil Angels ... 5/- & 7/6
Tin Foil Barbs 3"-4"-5" ... 6/-, 7/6, 12/-
Silversharks 2"-5" ... 20/-, 25/-
Pearlmouth ... 4/-
Red Veiltail Guppy ... 10/- & 15/- pair
Red Tail Sharks 5/- & 10/- ... Large 15/- each
Keyhole Cichlid ... 10/-

Our minimum order for fishes is £2, 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.

NYLON COATED AQUARIA, STOCK SIZES

24 × 12 × 15 ... £3 5 0
18 × 10 × 12 ... £2 0 0
White or black covers ... 18/6 & 25/-
Larger sizes on quotation

STANDARD AQUARIUMS

(Light Gauge)		(Angle Iron)	
12 × 8 × 6	10/6	24 × 12 × 12	55/-
15 × 8 × 6	10/6	24 × 12 × 15	60/-
14 × 8 × 8	15/-	30 × 12 × 15	80/-
18 × 8 × 8	17/6	36 × 12 × 15	97/6
18 × 10 × 10	23/6	48 × 12 × 15	130/-

COVERS		STANDS	
18 × 10	16/-	18 × 10 × 36	35/-
24 × 12	23/-	24 × 12 × 36	50/-
30 × 12	32/6	30 × 12 × 36	55/-
36 × 12	37/6	36 × 12 × 36	60/-

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

FOODS

Exotic Flakes ... 1/6
Hykro Flakes ... 3/-
Brosiam ... 1/6 & 2/6
Biovit ... 6d. & 1/6
Dry Daphnia ... 6d. to 2/6
Liquifry ... 2/6
Infusyl ... 2/6
Blue ... 2/6 C.W. 2/- & 5/-
Hobby ... 2/- & 7/-
McLynn's ... 1/6, 2/6, 5/6, 17/6
Brine Shrimp ... 2/-, 2/6
Tetra Min Growth Food Halmol ... 4/3
Wardley's ... 6/-, 4/6, 2/6, 2/3, 1/3
Pansary ... 2/-, 5/-
Tetra Min ... 1/11, 3/3, 7/6, 24/6, 84/6
Sonegrow ... 1/3, 2/6
Vitakraft ... 1/10 & 6/9
Wanderlust Food ... 3/6, 6/9, 22/6

Add 1/- up to 10/-; 1/6 up to 20/-; 2/- up to £2; 3/- up to £3; over Free
CARRIAGE AT COST CHARGED ON AQUARIUMS, STANDS, AND TANKS, SENT AT OWNER'S RISK
(Enquiries stamped envelope please) Terms, Cash with Order

THE CENTRAL AQUARIUM

Situated on the A41 Route, opposite Hendon Central Station

391 HENDON WAY, HENDON CENTRAL, N.W.4 Phone: HEN 9700
OPEN 8.00a.m.-6.00p.m. Sundays 9a.m.-1p.m. Emergency Phone: HEN 9700

DUMPY Thermometer
6/6

SHOP WINDOW

MINOR

Thermostat
10/- & 12/6

PRESET-MATIC
24/10

FLEXIBLE Heater
19/4

DIAL-O-MATIC
41/5

WHITE SPOT
REMEDY
4/9

'SUPERB' Heater
10/2
'STANDARD'
7/6

'MAJOR'
Thermostat
15/-

'SUPER
SUMMIT'
25/-

'SENTINEL'
Thermostat
28/-

'SUMMIT'
Pump
21/-

'VIVO'
Rejuvenator
3/9

ASK YOUR DEALER FOR

'Es-Es'

Manufactured by

SINGLETON BROS (Electronics) LTD
THE PRAZE, PENRYN, CORNWALL

Testimonials prove that

IT PAYS TO BUY WINDMILL PRODUCTS

"WINDMILL" HAND REJECTOR AQUARIUM CLEANER

Complete with Hand Bellows

15/- each

"REGENT" INSIDE FILTER

Designed for easy cleaning

10/- each

"WINDMILL" AIR REJECTOR CLEANER

will work connected to any make of Aerator

10/- each

"WINDMILL" BREEDING TRAPS

Beautifully Designed and Constructed

19/6 each

RETAIL ENQUIRIES FROM ALL LEADING WHOLESALERS

Tried, Proven and Tested

THE ORIGINAL

PREMIER BIOLOGICAL FILTER

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

They are saying . . . .

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

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

3. PLANT GROWTH — in tanks fitted with the Premier Biological Filter plant growth has been more healthy—plant roots do not rot away.

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

5. NO MESS—filter mediums are not required for use with The Premier Biological Filter, saving need for replacement, provides a cleaner job and saves money spent on filter mediums. Completely eliminates need for syphoning and prevents black gravel, disposes of sediment where it settles.

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

Made for 18" tanks at **12/6** each. 24" tanks at **15/-** each
Other size tanks see fitting chart of filter box

Pamphlet willingly sent on receipt of 3d. postage

WINDMILL PRODUCTS

244 VAUXHALL BRIDGE ROAD, LONDON, S.W.1

Telephone: Victoria 5179

ONE OF ENGLAND'S FOREMOST AQUARISTS

JUDGE FOR YOURSELF

OUR QUALITY, OUR PRICES,
OUR SELECTION OF TROPICALS,
MARINE TROPICALS, COLDWATER FISH
AND PLANTS

WE ALWAYS GIVE 100% SATISFACTION

It is in your own interest to pay us a visit

MANY SHIPMENTS OF BOTH
FRESHWATER AND MARINE TROPICALS
ARRIVING WEEKLY

WHOLESALE ORDERS EXECUTED IMMEDIATELY

SPECIALISTS AND BREEDERS
OF TROPICAL AND COLD-
WATER FISH. LIVE FOODS.

CHISWICK AQUARIA

136, CHISWICK HIGH ROAD, LONDON, W.4

TELEPHONE: CHISWICK 6549 CABLES: CHISAQUA, LONDON, W.4

PLANTS, ACCESSORIES.
BIRDS, BIRDCAGES.
EXHIBITIONS AND
INSTALLATIONS.

How does *your* tank look after 5 years?

Genuine **METAFRAME**

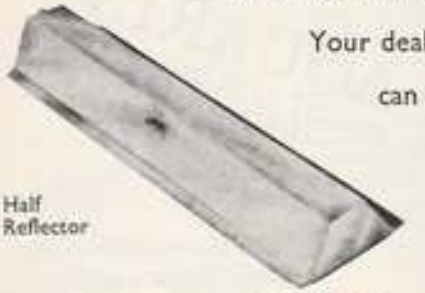
Metaframe tanks are made from top quality stainless steel. Won't rust—resistant to sea-water— engineered to prevent leakage.

Metaframe prices are little more than angle iron — therefore your long term investment in a superior job is very small.

A Metaframe stainless steel aquarium will be as smart as the day you bought it!

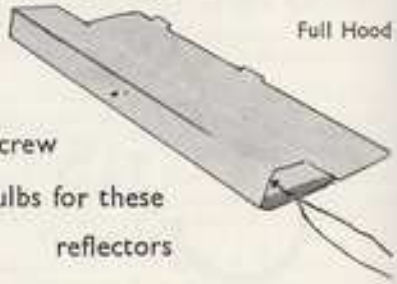
Nominal Size Long	Wide	High	Tank	Stainless Half Reflector	Stainless Full Hood	Stow-a-lite
16"	8"	10"	39/9d.	20/10d.	36/–	43/4d.
20"	10"	12"	65/5d.	23/4d.	41/4d.	62/5d.
24"	12"	12"	80/–	25/1d.	47/4d.	78/4d.
24"	12"	16"	150/11d.	25/1d.	47/4d.	78/4d.
30"	12"	12"	150/11d.	31/3d.	58/11d.	115/8d.

Electrical fittings extra—7/6d. for 16". 13/6d. for other sizes.



Half Reflector

Your dealer can supply Edison Screw bulbs for these reflectors



Full Hood

METAFRAME AQUARIUMS — manufactured in England in our own factory

INTER-PET — DORKING — SURREY

IT'S NEW IT'S BETTER
TRY SOME

IN THREE SIZES
2/9 — 5/6 — 15/6

A superior aquarium product by *Aquatic-Hobby Ltd.*

WE OFFER

Diamond Bass ...	5/6
Peacock Eyed Bass...	5/–
Bitterling	5/–
Dog-Fish	4/6
Silver Orfe... ...	4/–
Fantails	6/6
Orandas	7/6
Black Moors ...	7/6

Goldfish and Shubunkins From 2" to 10".

Minimum order for fish **30/–** Plus **15/–** Carriage & Packing.

★

LIVE FOODS

Wingless Fly ... ... Culture	7/6
Grindal Worm ... ... Culture	3/6
Micro Worm ... ... Culture	3/6
White Worm ... ... Culture	3/6
White Worm 1 oz. Post Paid	7/6

QUALITY

An excellent large selection of tropical fishes with a very wide variety of plants, equipment, etc., always in stock.

★

We endeavour to have a comprehensive range of egg-laying Toothcarps during October. We should have Calliurium, Gardneri Rachovi, Palmeri, and other rare species, with Species arriving each month according to availability.

★

All types of standard sizes of aquaria in stock. Any size made to order.

★

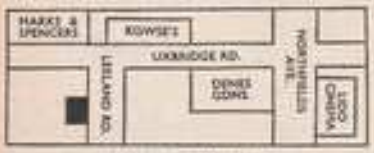
Metaframe Stainless Steel Aquaria and Covers.

★

NOT QUANTITY

J. T. HUNT (AQUAPETS) LTD

17 LEELAND ROAD, WEST EALING, W.13
Tel. EALing 2748



BUSES: 207, 207A, 255, 83

Opening Hours 9.00—5.30.
Half-day Wednesday

WE CATER FOR THE NEW AND FOR THE EXPERIENCED AQUARIST

382 EWELL ROAD, TOLWORTH, SURREY
Tel. ELMbridge 0678

BUSES: 281, 406, 418, 280

... but the better aquariums

are glazed with

ARBOLITE Q.S.
Aquarium Glazing Compound

This versatile, watertight compound is now available in a range of pleasant shades-grey, cream, red, green and blue. Packed in 1 lb; 2 lb; 4 lb; 7 lb. and 14 lb. tins and in ¼ cwt., ½ cwt. and 1 cwt. kegs.

ADSHEAD RATCLIFFE

ADSHEAD RATCLIFFE & CO. LTD.
BELPER · DERBY · Tel: Belper 2891 (3 lines)

FOR 1ST Class Results in any filter use

A really fine synthetic filter wool supplied as initial equipment with

HALVIN AIRLIFT FILTERS

& EHEIM POWER FILTERS

A quality product by

S.C.A.N. LTD Colnbrook Slough Bucks

SPECIAL PLANT COLLECTIONS

It may be necessary to substitute certain plants owing to the time of year

TROPICALS

A — £1
30 plants including Dwarf Lily Cryptocoryne Wisteria

B — £1
12 Vallisneria
12 Myriophyllum
3 Micro Sagittaria
6 Ludwigia
6 Elodea Densa

C — £1
12 Vallisneria
4 Myriophyllum
6 Ludwigia
4 Elodea Densa
4 Bacopa
1 Amazon Chain Sword
1 Portion Clover

D — £1
1 Nymphea Stellata
1 Giant Hygrophila
1 Aponogeton
1 Wisteria
1 Giant Sagittaria
1 Cryptocoryne
1 Indian Fern
1 Portion Clover

E — 10/-
6 Vallisneria
6 Myriophyllum
6 Hygrophila
4 Elodea Densa

POND PLANTS

G — £1
30 plants including Marginals

H — £1
20 Pond Plants
1 Cream Water Lily (Prince Alba)

AQUARIUM OR POND

F — £1
12 Sagittaria
6 Myriophyllum
6 Ludwigia
6 Moneywort
6 Hornwort
1 Portion Riccia
3 Elodea Densa

S — 7/6
Giant Amazon Sword Plants 6-8 inches

T — 2/6
Water Lettuce Very beautiful plants or 5 for 10/-

X — 3/6
Spatterdock

SPECIAL

Algae eating snails for your Pond & Aquarium

1/- each

BOW AQUARIUMS

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

48in. × 12in. × 15in.—29 gns.

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

STANDS

18 × 10 × 36 ...	37/6
24 × 12 × 36 ...	47/6
30 × 12 × 36 ...	52/6
36 × 12 × 36 ...	57/6
48 × 12 × 36 ...	67/6

BACKING PAPERS

STRATA ROCKWORK
SEA & SHORE
BLUE SKYS
SAND & SHELLS

24in. long × 20in. high, 3/6 per sheet, or 1/3 per foot. (post free)

THERMOSTATS

Constat External ...	36/-
Springfield External ...	30/-
Springfield Int./Adj. ...	15/-
Springfield Int./Adj. ...	18/-
UNO	
Int./Adj. ...	15/-
Int./Adj. "Popular"	10/-
"Popular" with neon indicator ...	12/6
Rena (with Neon) ...	21/-
"Ez-Fa" Sentinel ...	26/6

THERMOMETERS

	each
Mercury	
Gem ...	6/6
Plastic Backed ...	6/6
Spirit Blue Gem ...	5/-
"Ez-Fa" Dumpy ...	6/6

FILTERS

	each
"Windmill" Plastic Outside Filter ...	19/6
"Windmill" Biological Aquarium Filter 12/6,	15/-
"Windmill" Regent Inside Filter ...	10/-
Corner Filter ...	8/-
Air Lift ...	3/6
"Klas Jiet" Outside Filter ...	17/6
"Klear King" Outside Filter ...	22/6
Bottom Filter ...	8/3
Uno Polyfilter ...	3/6
Gro-Well Bubble-up ...	35/-

AERATORS & PISTON PUMPS

	each
Montrose ...	21/-
	24/-
Fairy ...	27/6
Star ...	40/-
Rena ...	60/-
Zoobeka Total ...	75/-
Hy-flo Junior ...	107/6
Hy-flo "A" ...	130/-
Hy-flo "B" ...	160/-
Hy-flo "C" ...	250/-

HEATERS

	each
"QUEENSBOROUGH" 25w., 40w., 60w., 75w., 100w., 120w., 150w. ...	10/-
Rena (75—200w.) ...	10/-
"Ez-Fa" Flexible Heaters (100w.) ...	19/-
"Ez-Fa" Thermostatic Heaters, 100w. and 150w. ...	36/-
Presst-matic ...	24/6
Inter-Pet Thermostatic Heater 25/- and	35/-
Heater Holders ...	1/3

REMEDIES, etc.

Halamid ...	3/6
Liquitox ...	2/-
Diasentox ...	2/6
Brosiam White Spot Cure ...	3/6
Sea Salts ...	1/6

SEDIMENT REMOVERS

	each
"Windmill" Air Rejectors ...	10/-
"Windmill" Hand Rejectors ...	15/-
Fishtail ...	3/-
Syphon Tubing ...	7d. ft.
Hand Type Plastic ...	4/6
Swirl Away ...	46/8

PLANTS

	each
Vallisneria Spiralis ...	1/-
Elodea Densa ...	1/-
Hygrophila ...	1/-
Bacopa ...	1/-
Sagittaria natans ...	1/-
Sagittaria micro ...	1/-
Vallisneria torta ...	1/-
Ludwigia ...	1/-
Myriophyllum ...	1/-
Cryptocoryne Beckettii	1/-
" *Willisii* 2/6 and	5/-
" *Cordata* 2/6 and	5/-
" *Haertelliana* 2/6 and	5/-
Water Wisteria ...	2/6
Giant Hygrophila ...	2/6
Giant Sagittaria ...	2/6
Amazon Chain Sword	2/6
Duckweed per portion	1/-
Riccia per portion	1/-

FOODS

Exotic Flakes... ...	1/6
Hykro Flakes ...	1/-
Brosiam ... 1/6 and	2/6
Brosiam Progrein ...	1/6
Liquifry Nos. 1 and 2	2/6
Infusyl ...	2/6
Dried ... 2/- and	4/6
Elite Daphnia / Ground Shrimp / Fish Food — Our own pack	6d. / 1/- / 1/6 in 3 sizes
Ants Eggs ...	6d.
Wardley's Treat Pac. 7 kinds of food ...	8/6
Hi-Glow ...	4/6
Biol ...	3/6
O. Bartmann ...	2/6
Foodex ...	2/6
Supreenie ...	2/6
Terramin Flake (all sizes) 1/11, 3/3, 7/6, 24/6 and	87/3
Bemgrow ... 1/- and	2/-
(fry food) ...	1/3
Vitakraft 2/-, 6/9, and	22/6

LIVE FOODS

Brine Shrimp Eggs	2/6 and 4/6
Cultures of	
Nest Worm 1 oz. ...	7/6
" " 2 oz. ...	12/6
White Worm ...	3/-
Micro Worm ...	3/-
Tubifex worms 1/6 and	2/9

BOOKS

Tropical Fish in the Aquarium ...	17/6
Aquarium Plants ...	36/6
Freshwater Fishes of the World ...	84/-
Diseases of Fishes ...	15/6
All about Tropical Fish	77/-
Encyclopedia of Tropical Fishes ...	63/6
Electricity in your Aquarium ...	8/6
Illustrated Dictionary Of Tropical Fish ...	47/6
Exotic Tropical Fishes	150/-
All T.F.H. Books	2/- each
The Book of the Garden Pond ...	16/6
A Manual of Aquarium Plants ...	17/6
Garden Ponds & Fish	12/-
Pond Life ...	8/-
Aquariums & Fishponds	5/6
Exotic Aquarium Fishes W. T. Innes ...	63/-

Postage Included

SUNDRIES

	each
Breeding Trap ...	15/-
Sucker Knob or Shank	4d.
" Double ...	6d.
Planting Sticks ...	1/3
Dry Floating Rings ...	1/-
" Square ...	1/6
Hykro (Tin can) Feeder	2/3
Worm Floating Feeders	1/6
Worm Cradle with Sucker ...	1/6
"Windmill" Diffuser Stones ... 1/- to	1/6
"T" Piece ...	1/-
Aerator Tubing	
Rubber ... ft.	4d.
Plastic ...	4d.
4 Way Piece ...	1/-
Clamps ...	1/-
Carbon ...	1/-
Glass Wool ...	1/3
Nylon Wool ...	1/3
Testing sets ...	18/6 and 28/6
	Post 1/9 extra
Hykro Leak Sealer ...	3/-

FULLY-GLAZED AQUARIUMS

Pressed Steel / **Angle Iron**

Inches	Tank	H'd	Refl.
12 × 6 × 6	10/6	—	6/6
14 × 8 × 8	13/6	—	7/-
16 × 8 × 8	15/-	—	7/6
18 × 10 × 10	22/6	15/-	8/-
24 × 12 × 12	52/6	22/-	8/6

Aluminium

Inches	Tank	H'd	Refl.
24 × 12 × 15	57/6	22/-	8/6
30 × 12 × 15	77/6	32/6	—
36 × 12 × 15	97/6	36/6	—
48 × 12 × 15	137/6	45/6	—

CARRIAGE EXTRA

Please add 1/6 extra postage on appliance orders up to 10/-; 2/- up to 20/-; 2/6 up to 30/-. Glass, China, Shells and Live foods sent at purchasers own risk.

QUEENSBOROUGH FISHERIES

111 GOLDHAWK ROAD, SHEPHERD'S BUSH, W.12
(1 minute from Shepherd's Bush Market)
Telephone: SHE 2730
Hours of Business: MON. to SAT.— 9 a.m.-6.30 p.m. CLOSED THUR.

QUEENSBOROUGH HOUSE, Ferry Lane, Hythe End, Wraysbury Nr. Staines
Telephone: WRAYSBURY 2085
Sundays only from 10 a.m. to 4 p.m.

16 PICTON PLACE, LONDON, W.1
(1 minute from Selfridges)
Telephone: WELBECK 5438
Hours of Business: MON. to FRI.— 9.30 a.m.-6 p.m. SAT. 9.30 a.m.-5 p.m.

ALL POSTAL ENQUIRIES TO GOLDHAWK ROAD ADDRESS

The **AQUARIST**

AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"

THE BUTTS, HALF ACRE, BRENTFORD, MIDDLESEX
Telephone: ISLeworth 6221
PUBLISHED MONTHLY
SUBSCRIPTION RATES

The Aquarist will be sent post free for one year to any address for £1 15s. 0d. Half-yearly 17s. 6d. Canada, U.S.A. $5.00 yearly; $2.50 half-yearly.

QUERIES

Postal replies are made to all specialised queries accompanied by a stamped, addressed envelope. *This privilege is afforded only to registered readers and direct subscribers.* Subscription forms can be obtained on application. In all cases letters should be addressed to the Editor.

Correspondence with intending contributors is welcomed.

MSS. or prints unaccompanied by a stamped, addressed envelope cannot be returned, and no responsibility is accepted for contributions submitted.

The Editor accepts no responsibility for views expressed by contributors.

Contents

VOL. XXXI No. 7 1966

Some forgotten fishfoods

by H. J. VOSPER

THE wonderful pieces of ready-made equipment available to the modern aquarist stem from an industry backed not only by up-to-date technical processes but also by the know-how of designers who are generally of long standing in the fish-keeping hobby. Similarly with the new and especially balanced diets, modern processes and long experience are again conjoined to provide aquarists with first class materials. Yet one might be excused a small tear at finding so many of the old, tried and traditional methods cast aside, for while newcomers to the hobby cannot be expected to know all the ancient tricks, there appears to be little excuse for those grown grey in aquarium service to have given up all those tasks which at one time meant so much to the fishkeeper.

While not at all wishing to denigrate the value of modern prepared foods—indeed, a new process adapted to an old food was seen recently, with such results that one could scarcely believe one's eyes—yet dependence upon one single foodstuff or upon the presence of a local shop might not be always wise. It was in order to avoid such factors as these that the ingenuity of aquarists turned, at one time, to the manufacture of numerous specialities and while these processes are not entirely abandoned there appear to be fewer and fewer people undertaking them, therefore a reminder of some methods used might not come amiss.

Raw white fish and liver, shrimps, prawns and crab-meat (in the latter case, not necessarily that of the edible crab) is very useful, but these can also be preserved if dried in a moderate oven to a crispness just below burning, being then pounded into fine particles and sieved to various grades suitable for the fishes concerned. Stored in air-tight containers (old hair-cream bottles, for instance) these foods will keep indefinitely.

This simple drying method was possibly the first one adopted by aquarists, but many variations ensued. The raw liver and fish can be cut into strips of suitable length and

Continued on page 142

Fishes of the Congo (3)

by A. VAN DEN NIEUWENHUIZEN

(Photographs by E. Graindorge and A. van den Nieuwenhuizen)

IN a letter which I received at the time from Mrs. Graindorge, she wrote: "Swarms of fishes are everywhere; at least four kinds of *Barbus*, with and without spots or dots, but with reddish fins. All of them have a reddish or golden glitter. The largest fish measures about two inches long and has a deep body, full of eggs. Many lilac-blooming nymphaea and yellow-blooming othelias grow in the sluices. In one small pool a foot deep we found 20 small *Nothobranchius*. They were almost all females. Yesterday we found a new fish in one of the sluices, a gleaming gold with a greenish-black longitudinal band along its sides. This band ends at the tailroot in a small, gold-edged blackish fleck. Later, a friend discovered in the area a quite attractive, pinkish fish with a wide, longitudinal band beginning at the lip and ending at the tail. One could describe the stripe as a coarsely-drawn charcoal stroke. The flanks and fins are red with the exception of colourless pectoral fins. We suspect that it is some sort of *Barbus*. These slender and elongated fishes are one-and-a-half to two-and-a-half inches long. Further we found in ponds and sluices everywhere, *Kneria*; rather long, grey fishes with a golden body. They scuttle about in schools and clean the plant surfaces. These up to .4-inch-long fishes, however, do not have sucker lips and as far as we know, live alone in their surroundings. Up to now, we have not found them in other locations. Among the small bluish and greenish fishes with bulging eyes, there are decidedly four species, the largest being up to one-and-a-half inches long. . . ."

Naturally, such an account is sufficient to awaken one's "fatal curiosity" and so, requests were made for more exact details, possibly even preserved specimens so that determinations could be made. Actually, we received some materials which were sent to the Zoological Museum in Amsterdam but, unfortunately, to this day, a report has not been received. Later, a letter arrived in answer to one of ours in which we had enclosed a colour photograph. Now it was clear that the fishes with the bulging eyes were *Aplocheilichthys* and later it was determined that one of the species found in the environs and even farther away was *Aplocheilichthys katangae*. This was not surprising, considering that the name "Katangae" means "from Katanga".

The following account was given among other things, about this fish: "Last week we travelled on foot through the bog . . . that is to say, through a part of it. Our guide had previously uncovered a few pools for us that, according to him, contained water all the year round. Unfortunately, this year (1959) was so dry that not a drop of water was to be found in these places. Then he took us to the former location of a small stream but there was little left there either. We found a few dirty puddles containing gnat larvae. Here we found *Aplocheilichthys katangae* and *Barbus*. The *katangae* were very young . . . spawning must have taken place during the dry period under very bad conditions. We encountered specimens scarcely three-eighths of an inch in length. One of the species found in the pool resembled *Pachypanchax playfairii*. Its colour was, however, quite different—silvery with an overall greenish sheen, and a bluish tinge in the eye. On the body were the reddish dots and dashes reminiscent of the *playfairii*".

So, finally we obtained more exact information about the natural habitat and locality of *Aplocheilichthys katangae*. Later, to our surprise, we received some data concerning *Aplocheilichthys pumilus*. The Graindorge family travelled to Natal, just across the border of the former Belgian Congo. There they found another *Aplocheilichthys* which, after description and comparison, was identified as *A. pumilus*. Both *A. katangae* and *A. pumilus* are aquarium fishes. Where *A. katangae*, however, was found in dirty water, swimming in close schools at the surface, *A. pumilus* was found in northern Natal in rather fast flowing creeks almost or utterly devoid of plant growth. These creeks flowed through a region where there are many Mimosa stands, these trees multiplying naturally and helping to fight erosion. The water in these creeks is crystal clear and many rocks lay on the bottom. Unfortunately, details

A male A. katangae

about water hardness and pH are lacking. The question now is, what sort of aquarium conditions should we provide for these fishes? They can be kept in an aquarium which I will describe in a future article about *Aphyosemion*, since they do well with similar fishes or with *Nothobranchius*. I personally find these fishes to be less suitable for the densely populated community aquarium but that is perhaps, a question of individual taste. These fishes do about as well in hard as they do in soft water, and adjust best at temperatures between 73° and 77° Fahrenheit. They prefer a sunny tank. Whenever they are kept together with *Nothobranchius*, one must use floating water plants in order to alternate shaded and sunny areas. Variation in feeding is of considerable importance but I will not say much more about this here. Let it suffice to say that fruitflies (*Drosophila*) are greedily eaten, likewise mosquito larvae and other larval insects.

There is not much difficulty in breeding these fishes.

The newly hatched fry of A. Katangae. They are of the typical fishbone design and by their long, lean bodies, are immediately distinguished from the fry of Aphyosemion, Epiplatys etc.

A phase of the pairing of A. pumilus. The difference between male and female is clearly shown in this picture.

It is possible even in a 1-gallon tank, although larger tanks are better. Just as with *Aphyosemions* species the sexes are separated before spawning (about a week before). It is a good idea never to mix the females of these two *Aplocheilichthys* species for they closely resemble each other. I always fill the breeding tank with water from one of my other tanks for it has been my experience that they do not always react well to new water, this risk being hence avoided. At that time these two species were still relatively rare and it was better to play it safe. In subsequent spawnings I gave little thought to water composition and regularly made partial changes of water.

One can spawn these fishes in two ways: (*a*) by picking the eggs from the spawning substrate or (*b*) by leaving the eggs in the breeding tank. I always pick the eggs out and therefore employ a bundle of nylon wool. This mop is hung in one corner of the aquarium so that the *Aplocheilichthys* can lay their eggs right under the water surface. However, they spawn well also on Spanish moss placed in trays lying on the bottom. When in good condition, they are relatively productive. In one week, one may obtain about 100 eggs from a trio; sometimes more, sometimes less. If one keeps them in a breeding tank constantly, they apparently enter into a rest period wherein they do not breed. As one observes the pairing, the male swims away from the female attempting to lure her to the spawning site. After the female arrives, the male swims next to her. One egg is laid per pairing and as with many other fishes, the male envelops the female with his dorsal and anal fins.

The development of the eggs is dependent upon the temperature, usually lasting between 9 and 14 days. As soon as the young hatch, they are able to eat brine shrimp. Here is where many hobbyists make a mistake. The result is that they complain of slow growth or a cessation altogether. In the beginning, however, the young grow successfully. Whenever these hobbyists are questioned as to what is being fed, they reply, "brine shrimps". As to the question of how long this food has been given, the answer usually is "six to ten weeks". My dear aquarist friends, did you eat the same food the first six years of your life? (a comparable period in the life of fishes). Feed your young fishes a variety of foods insofar as possible including coarse grinds and in the beginning even infusoria. If this is not possible to find in the ponds, try a little green water. In the summer-time this is quite easy—just place a few large containers of water in the sun. Quickly algae will form in the water, turning it green. Regularly add a drop of this water to the rearing tank. If these rules are followed, you will encounter little difficulty in the rearing of species of *Aplocheilichthys*.

We conclude now with a discussion of the use of refrigera-

Continued on page 135

Photographing aquaria

by B. WHITESIDE

THERE are many good photographs of aquaria, fish and aquatic plants in a host of books and magazines, but many of these have been taken by the experienced or professional photographer who has applied his skill and knowledge to these aquatic subjects. Some of such good pictures turn up again and again, pointing to the fact that there may be a shortage of reasonably good new photographs. Many of these photographs have been taken using expensive equipment and by using techniques which require the removal of fish or plants from their normal home aquarium; or by confining fish to the front of the tank by using a sheet of glass along the length of the tank, near the front. The sheet of glass becomes almost invisible when submerged.

Although I have not produced any *good* pictures I have found that *reasonable* photographs can be taken using relatively cheap equipment. I have tried a variety of techniques in trying to photograph aquaria, and some of the resulting information may be of use to other readers interested in this branch of our hobby. I would like to thank Mr. D. B. Greenland, an aquarist with whom I have been corresponding, for some of his useful advice in this field. He has sent me some good photographs which he has taken, and provided me with the motivation to continue experimenting with photographing aquaria.

My attempts were made with a British camera, 35mm., costing under £12. Other accessories used were a cable release costing a few shillings, a flash gun and flash bulbs which were inexpensive, and a light meter costing about £4. My first photographs were taken using flash and, as the first photograph shows, were poor. I tried taking pictures with the camera about 3ft. from the aquarium and using a film with a speed of 125 ASA, at 1/30th second, using a flash gun and bulbs. To diffuse the light from the flash and to allow me to get closer to the tank, I covered the flash gun with a white handkerchief. Here one meets with the problem of reflection of the flash gun and handkerchief, etc., in the front glass as the photograph shows. This problem could, of course, be overcome by using the flash at an angle, but such results as were obtained in this way were little better than the first photograph minus the reflections.

Hence I abandoned the use of flash and tried using a hand-held exposure with the normal tank-light on. Naturally, this method gave blurred pictures.

I tried mounting the camera on a tripod, using the light from the tank hood. This method which I will explain in detail, gave the results shown in photographs two and three. Using the 35mm. camera mentioned, with a film rated at 125 ASA, I mounted the camera on a tripod. Using an exposure metre held closely against the glass at gravel level I got a reading of $\frac{1}{2}$ second at f.8. The tanks were 18in. × 10in. × 10in. and 20in. × 10in. × 12in., lighted with one 60 watt tungsten bulb. As my camera only focused down to 3ft., I decided to use a stop of f.8, and increase the exposure to two seconds for both sizes of tanks. I set up the camera on the tripod and focused at 3ft. 4in. from 4in. behind the front glass of the tank. This meant that all objects in the photograph from 3ft. to 4ft. should be in focus due to the depth of field at f.8. This depth of field was sufficient for the 10in. deep tank.

As I did not want to disturb the fish in the tank by removing them, I decided to wait until it was dark, at night and left the tank lights off until I was ready to photograph. This meant that the fish would be asleep and would not move for a few minutes after the tank lights were switched on. In a time exposure of two seconds wide-awake fish

...ust move about the tank leaving "trails" of light and moving plant leaves, thus spoiling a sharp photograph.

To ensure that the photograph was as sharp as possible I cleaned all the algae off the front glass of the tanks the day before and polished the outside of the glass with a well known brand of window cleaner. Although the front glass of a tank may look clean to the eye, the camera lens shows up a lot of dirty streaks which can go unnoticed to the eye. After setting up the camera on a tripod in front of the tank, focused and placed at exactly 3ft. 4in. from 4in. behind the front glass, I fitted the cable release, set the stop at f.8 and the exposure setting at "brief", using a torch to see with as the room was in total darkness. I then switched on the aquarium light (60 watts), paused until I hoped that no fish would move for two seconds, and made my exposure. The ideal, of course would be a furnished aquarium without fish, since plants should remain fairly well at rest although most plants, especially *Nomaphila stricta*, will move under the influence of light.

The ends of the aquarium, and any shiny objects which would reflect light into the camera lens, should be covered with dark paper or cloth. Stray light from beneath the hood of the tank will also appear in the photograph but this part may be trimmed off in the finished print. With larger aquaria than those which I have photographed, the whole tank may fill the frame of the finished print. In my case a large part of the print was not filled by the lighted aquarium so I had enlargements made of the lighted area. If very large prints are required a better result would be obtained with slower film which would require a longer exposure but would show less grain in the enlarged 35mm. negative. The best sort of camera would be the type in which one can focus through the camera lens. My own camera has the view-finder mounted above the lens and focusing needs a tape measure for fairly close work.

In conclusion I would say that working on the above lines, the aquarist with suitable equipment should try photographing his own aquaria. Trial and error methods are probably necessary but the results can be quite acceptable. It is wise to keep a note of each camera setting etc. and note book together with the number of the frame on the film used for each exposure. In this way one can later

pick the most suitable combination of factors and repeat the photographing.

For close-up work special lenses are necessary for a relatively cheap camera such as mine. These are inexpensive but focusing is critical and a high f. number is necessary to obtain depth of field.

With trial and error methods, based on the above facts, and with experience, aquatic subjects are within the range of the amateur aquarist with an interest in photography. Even with cheaper cameras than mine, presentable photographs can be taken which are interesting to look back on after a few years.

Continued from page 132

Fishes of the Congo (3)

by A. van den Nieuwenhuizen

ent dishes filled with nylon wool, mentioned in my previous article. As is known, bottom-laying fishes of the genera *Aplyosemion* and *Nothobranchius* lay their eggs differently from *Cynolebias* and *Pterolebias*. They do not stick their heads deeply in the spawning substrate but rather lay near the top, pressing the posterior portions of their bodies into the substrate. If one places only a refrigerator dish containing plugs of peat or bundles of nylon wool into the aquarium, there are no other places then in which they can lay their eggs. These eggs are easily sought out and removed and then placed into shallow dishes containing a solution of acriflavine or a comparable disinfectant. With those bottom-spawners having eggs with an extremely long development time such as *Nothobranchius rachovii*, *N. brieni* and *Aplyosemion gioestedti* one has an opportunity to control this development during the first weeks and to remove the non-fertile eggs. Afterwards they can be stored in peat in these containers in the usual way described in the literature. In this way moreover, you can control their storage conditions and ascertain the moment for best hatching and thereby obtain the highest possible productivity.

OUR EXPERTS' ANSWERS TO TROPICAL FISH-KEEPING QUERIES

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

I should like to keep a tank of tropical fish in my living room but cannot afford the space necessary to accommodate it near the window. Is it possible, therefore, to maintain fish and plants in good health under electric light alone? If the answer to this question is in the affirmative, I should be grateful for the names of a few different species of plants which will thrive under electric light (wattage and number of light-hours, please) in a 36 in. by 12 in. by 12 in. aquarium.

It is possible to maintain a flourishing collection of tropical plants and fishes under electric light alone. We suggest you use a 20 watt natural or warm white fluorescent lamp (the Atlas 2 ft. fitting is ideal) and keep it switched on for at least ten hours every day, though a few hours in excess of this will do no harm. Plants that will grow well under this type of illumination in clear, soft water include *Cryptocoryne beckettii*, *C.affinis*, *C.blassii*, *Sagittaria subulata*, *Microsorium pteropus* and *Vesicularia dubyana*.

I set up my first aquarium (a heated one) about a fortnight ago, but since then the compost along the front has developed what appears to be a greyish-white mould and the fish keep swimming agitatedly at the top. Obviously something is wrong. May I have the benefit of your advice?

It would appear that you have been feeding dried food too generously with the result that the uneaten leftovers have decayed and brought about a toxic condition of the water—and resulted in the mould. Siphon most of the water and remove all of the mould-covered compost from the aquarium with the least possible delay, and then run in fresh water brought up to the same temperature as the water left in the tank.

Could I breed livebearing fishes in a wooden box lined with polythene sheeting and lighted by a 60-watt lamp fixed just overhead?

Provided the electric heater necessary to maintain the water at the correct temperature range of 72°F. (22°C.) to 78°F. (26°C.) is held just off the sheeting by a few pebbles or some other non-toxic support, the short answer is yes.

Please tell me how many units of electricity are consumed daily to maintain a 24 in. by 12 in. by 12 in. aquarium at a temperature in the neighbourhood of 75°F (24°C.).

Roughly one unit, but less during really summery weather, or if the room in which the aquarium stands is kept comfortably warm at night.

Is it true that after a batch of air-breathing *anabantid* **fry have hatched out it is advisable to draw sheets of newspaper across the surface of the water every so often to prevent the formation of a suffocating oily or dusty film?**

Anabantid fry do not start to take in oxygen from the atmosphere until they are a few weeks' old. By this time they are usually strong enough to break any ordinary film on the water. Be that as it may, it is advisable to keep the surface free from dust or green slime.

I would like to know whether the size a fish grows to determines how many years it will live, that is to say a 2 in. fish two years and so on?

Size has little to do with the longevity of the average tropical aquarium fish. For instance, a 2½ in. *Corydoras paleatus* will outlive a Siamese fighting fish by five or six years. A neon tetra will sometimes attain a greater age than a blue acara. But we do know that the fishes that produce youngsters at quite frequent intervals and do a tremendous amount of dashing about usually have a life span not exceeding two or three years.

With colder weather not far ahead, what is a reliable method of preventing heat-loss in a tropical aquarium?

Attach thick foam sheeting, thick felt, or the like, to the bottom, back (unless this is the main source of natural light) and ends of the tank.

Please supply details of the general requirements, maximum size, suitability as a community species, and breeding procedure of the black-banded sunfish.

The black-banded sunfish must be given plenty of swimming space in soft, acid water. A temperature range of from about 65°F. (18°C.) to 75°F. (24°C.) suits it very well, but it is hardy enough—it ranges in the wild state in North America from Maryland to New Jersey—to stand a slow fall to the fifties (°F.) or lower with no ill effects. Gnat-larvae, *Daphnia*, whiteworms, and the like, are an essential part of its diet. Dried foods are swallowed without enthusiasm, if at all. It averages about 3 in. in length, and is peacefully disposed towards its own kind and other fishes. Spawning takes place on the bottom. The male uses his pectoral fins to scoop out a depression in the sand to receive the eggs. After the female has performed her duty, the male drives her away and fusses over the eggs. In three or four days the fry hatch out and may be given micro worms or brine shrimps right away.

Has the Malayan angel fish (*Monodactylus argenteus*) **been bred in captivity?**

So far as we know this species has not bred in captivity.

What is causing the guppies in my community tank to develop bent spines, wasted sides and a tendency to go into a rapid decline before six months are out?

In all probability your guppies are suffering from a deficiency in diet and too much in-breeding in overheated water. The remedy is obvious: new stock and greater attention to the species' diet and temperature requirements in the future.

Please give me some information about *Klausi chaperi*?

This 3½ in. member of the family *Characidae* is native to West Africa. It is commonly known as Chaper's characin. It flourishes best in a spacious aquarium filled with soft neutral to slightly acid water maintained at a temperature of about 75°F. (24°C.). Another of its needs is live food such as gnat larvae, *Daphnia*, and the like. So far as we know it has not bred in captivity, and we cannot say what secondary sexual differences, if any, exist.

I have just bought what I believe may turn out to be a pair of *Geophagus jurupari*. **How large does this species grow? Does it breed readily? Will it behave itself with other fishes in a community tank?**

G. jurupari may reach a length of 6 in. It will breed if given a tank furnished with deep sand and some flat stones. It is peaceful in its smaller sizes and in its larger sizes seldom molests fishes of about its own build. It is not as tough as some of the better known cichlids, and a temperature no lower than 70°F. (21°C.) is advised.

Is it necessary to keep a filter and aeration unit switched on all day? You see, my pump is rather noisy and I also prefer not to see the bubbles streaming to the surface.

In a properly cared for tank, there is no need to keep a filter working hour after hour. We suggest you switch on just before you retire for the night—to keep the fishes and plants well supplied with oxygen during the hours of darkness—and switch off again the following morning or afternoon.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I have been feeding my fishes on *Daphnia* and although they are alive when I buy them, they die off after a day or so. Is this due to the change of temperature?

It is more likely that the *Daphnia* die because the water in your bowl is insufficiently oxygenated. It is not easy to keep a number of *Daphnia* alive in a small container unless the water is very fresh or aerated. The same conditions are required for keeping these crustaceans alive as are for fishes.

I would like to feed my fishes on live worms. Would they keep alive for a week or more?

Garden worms can be kept alive for weeks as long as certain precautions are taken. Do not try to keep them in earth, but decaying leaves, also they must be damp, cool and in the dark. White worms can be kept alive indefinitely in damp peat if they are fed on damp bread, either brown or white. A small piece of cheese in the peat collects numbers of the worms when they can be removed easily with tweezers.

I have a shubunkin which has developed a jelly-like growth on one of its gills. It is of a firm nature but can be removed by wiping with wadding. It is about a quarter of an inch in diameter. What is it?

It appears to be a fish louse, *Argulus*. If you immerse an infested fish in a solution of a quarter teaspoon of Dettol to a gallon of water the louse should leave the fish immediately as these creatures can swim freely when searching for a host.

I have bought some sun bass and do not seem to be able to find anything that they will eat. They keep at the back of the tank; what should I do?

There are many species of sun fish but they all prefer live foods. They are rather similar in habits and feeding to our native perch. They also should have somewhere in the tank where they can hide from view as they are often very shy, especially when freshly purchased. Feed on any live foods and occasionally try them with dehydrated meat or pieces of meat or horse heart.

Could you please tell me if it is possible to keep coldwater fishes in a two gallon carboy?

You could keep a few fishes in such a container as long as it was only about half filled. The amount of water surface area is the important point in fishkeeping as each inch of fish needs 24 square inches of surface area. The carboy can be set up with some gravel and a few water plants, such as *Elodea canadensis* or *Egeria densa*. Only have one or two small fishes and do not over-feed. The carboy must not stand in direct sunlight or the inside of the glass will soon become covered with green algae. It must be thoroughly washed out before use, unless it has been used to hold distilled water.

I have a tank, 18 in. by 10 in. by 10 in. with some gravel and plants. I had two one inch goldfish but they have died. What is the reason?

You may have over-fed the fishes and the uneaten food would soon pollute the water and cause the fishes to die. As long as this simple rule is observed, no over-feeding, the fishes should live for a long time until they outgrow their tank.

Can you tell me if blanket weed will do any harm in a tank or pond if I have it in both?

Blanket weed is a form of plant life which can oxygenate the water. However, it can grow on other water plants and tends to choke the life out of them. It is also possible for young double-tailed goldfish to get caught up in it. You can remove most of it by twisting a broken stick into it and then much can be lifted out. If you do this once a week you will soon get it under control.

I am troubled with a number of spiders in my fish house and no matter how I clear the webs more are soon to reappear. I have a large number of tanks of fishes in the fish house and so cannot use insecticides to kill the pests.

I would always welcome any number of spiders either in a fish house or a greenhouse. As soon as you destroy webs the spiders will make fresh ones. They will not harm the fishes and will catch any flying insects in the house. If you must get rid of them try throwing a fly into a web. The spider will immediately rush out to catch it when you can take the spider and remove it or deal with it some other way.

Do goldfish grow much longer than ten inches as I have seen some much longer than this but I have been told that they are not goldfish?

Ten inches is a good length for a goldfish. Probably the ones you saw were golden orfe or hi-gois. Golden orfe are often eighteen inches long with a slim body and paler in colour than the normal goldfish. Hi-gois are large with a deeper body and can be of red, white or both with black markings, on some of them.

We have made a pond with Polythene lining and some small goldfish were introduced. After a short time the fishes disappeared for a few days and were later found dead but showed no signs of illness or damage. What could have caused their death?

I wonder if there was anything in the construction of the pond lining which could have killed the fishes. When fishes die and show no apparent reason I suspect that the water is poisonous. Goldfish do not just die without cause and I have had considerable experiences of fishes dying in water polluted by copper and these fishes have shown no outward signs whatever of damage or disease. If nothing harmful came from the Polythene then the source of the water could be at fault. If it came through copper pipes or came in contact with either copper or brass then this could be the cause of the death of the fishes.

I have a few goldfish in a pool and one seems unable to open its mouth. If I drop a worm in the water it seems interested but apparently cannot open its mouth to take the worm. What is the matter with it?

The fish may have a form of mouth fungus but I imagine that it must open its mouth to be able to get any water through the gills and so obtain oxygen. If you hold the fish out of the water it should open its mouth then, if not try pushing a blunt bone knitting needle in to see if it can be opened wider. A salt bath for a few days may put the fish right.

We have a problem with leeches in a small decorative pool in the garden. The fishes have been removed but we are afraid that the children may get into the pool and be injured by the leeches.

It is almost certain that the leeches in your pool would not harm the children. Anything strong enough to kill the leeches would kill the water plants. Trap them with meat tied to string left in the pool at nights.

What sort of stones should I place on top of the soil in water lily containers to prevent the fishes from disturbing the soil?

It does not matter what stones you use as long as they are of a good size to prevent the fishes from moving them.

I am shortly going to set up a tank, 30 in. by 15 in. by 12 in. and would like to know how much water it will hold and how many fishes I can keep in it. What types of fish are most suitable and can I keep Japanese rice fish?

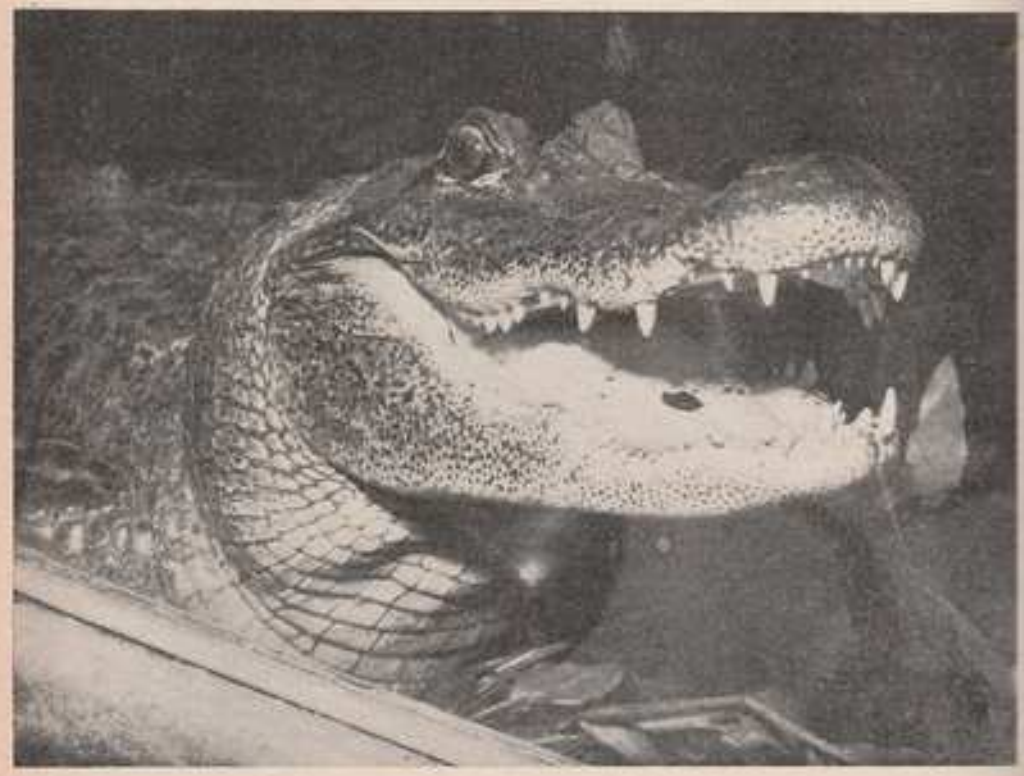
Your tank will hold about 20 gallons of water. Allowing for 24 square inches of surface area for each inch of fish, it will hold 15 inches of fish, not counting the tail. Good types for your tank would be small goldfish, shubunkins, fantails and bitterling carp. Japanese rice fish are tropicals and would need a temperature of 70-75°F (21-24°C). For plants for your tank and feeding you should see *Coldwater Fishkeeping* (from *The Aquarist*, 5s. 4d. post free).

Mating behaviour in the American alligators at Belle Vue Zoo Park, Manchester

by R. E. LEGGE

LAST year a pair of American alligators aroused considerable interest by mating, constructing a nest pile and laying eggs in the tropical jungle pool section of the new Reptilium at Belle Vue Zoo.

Although it is understood that alligator eggs have been sent over from America and successfully incubated in Europe, and that eggs have been dispelled by a female alligator brought over in a gravid condition, to the best of our knowledge this was the first incidence of mating in captivity. Unfortunately the eggs proved to be infertile.



Since January this year, the pair have again exhibited considerable mating behaviour, much of which has been recorded on 8 and 16 mm film. The special basking areas of the alligator pool enclosure had been provided with a quantity of dead leaves and decaying vegetation in which it was hoped that the eggs would be laid. On the 22nd May, several weeks earlier than last year, the female chose to lay a clutch of two dozen or more eggs in a most unexpected and unsuitable site, a narrow plant pocket in a rocky ledge immediately behind the armour-plate glass of the safety barrier. This was quite inadequate to hold all the eggs for, in spite of the fact that she had torn out the plants and scraped a hollow in the soil, a number of the eggs had rolled down the rocks into the water where the male was seen to devour several of them.

Any human approach evoked the most fearsome defensive display, the female leaping at the glass barrier, hissing loudly and snapping her jaws. As the site chosen was so close to the public pathway, anyone leaning over the barrier would have been in considerable danger. Moreover the eggs were in a vulnerable position, several having been broken by the alligator's efforts to protect them. It was therefore decided to remove them to one of the specially prepared sites nearby. By holding the reptiles off with branch shovels, the transfer was eventually effected, some of the eggs being retained for artificial incubation. However, the female continued to guard the empty hole and it was therefore found necessary to erect an additional temporary barrier to protect the public and to blank out the glass to screen the approach of humans, thus giving the female alligator some respite from her defensive activity. Finally a number of eggs were returned to the original nest hole and covered by leaves and soil.

The total clutch is now divided into three separate incubation possibilities and we understand that in the wild state the incubation period is approximately 10 weeks.

Since *Alligator mississipiensis* has been exhibited in countless zoological establishments for well over a century, it is interesting to speculate why the events described have not been widely observed and recorded before now. We would like to think that our meticulous attention to ecological conditions have contributed largely to their condition and behaviour pattern, but we are well aware that other establishments have been equally anxious to provide appropriate settings without finding the reptiles so obviously ready to breed.

The direct relationship between temperature and metabolic activity in reptiles is common knowledge of course, and in most Reptile Houses the atmospheric temperature is kept high enough to ensure a reasonable degree of well-being, but it is perhaps debatable whether the water is kept as warm as these reptiles would like.

To ensure that a sufficiently high water temperature is maintained at all times in our Reptilium, a circulation system has been arranged in which the flow from the pool passes through pipes of a reservoir where it is screened to remove gross suspended matter and pumped up through an oil-fired, boiler-heated calorifier to a shallow gravity tank situated on top of a rocky escarpment from which it tumbles in a waterfall back to the pool below. In this way a temperature ranging between 78° and 88°F. (25° and 31°C.) is maintained. Should the boilers fail at any time, auxiliary thermostatically controlled electric heaters beneath the pool will cut in. The continually flowing water, plus an optional mist spray apparatus high in the roof, ensures a high degree of humidity at all times.

These factors, together with the gradually sloping rock strata permitting the reptiles' ready access to the electrically heated basking areas, appear to have provided conditions that permit a far higher degree of activity, a voracious appetite, an unusually pronounced degree of aggressiveness and a very obvious reproductory urge.

Fine-leaved willow moss

by B. FRY

THIS scarce plant (in the wild state as well as in cultivation) is indigenous to Britain and is believed to be a variant of the common willow moss (*Fontinalis antipyretica*) that is usually found growing from wood or stone structures or debris, inches—or even feet—deep under running water. But whereas *F. antipyretica* removed from its natural setting seldom lasts very long in the unheated or heated aquarium, *F. antipyretica* forma *gracilis*—to give the fine-leaved variant its technical name—settles down very well in any cold or tropical tank provided algal growths and swirling sediment are kept in check. Light shade, furnished by towering thickets of other plants, and soft and acid water aid immensely in inhibiting algae. As for swirling sediment, this should never become a problem in a properly cared for aquarium stocked with fishes not addicted to turning over the compost.

In appearance, *F. antipyretica* forma *gracilis* is merely a miniature and paler green edition of the type. It grows very quickly at a temperature in the upper sixties to middle seventies (°F), and in a short time forms a pyramidal or fan-shaped bush upward of 12 in. in height. Apart from its decorative value, fine-leaved willow moss is a useful plant to have in a single species aquarium where free-breeding egg-scatterers such as White Cloud Mountain minnows or some of the oviparous tooth-carps reside. A good bunch spread horizontally over the bottom and weighted down with stones, or tied to a cork or feeding ring and allowed to float at the surface in shallow water can hardly be bettered for cradling and protecting adhesive and non-adhesive eggs. More than that, newly-hatched fry will find plenty of safe hiding places in the myriad tangles of foliage.

The Junior Aquarist

Pelmatochromis Kribensis

One of the most popular small Cichlids

by A. Coles (aged 14 years)

THIS fish belongs to the smaller representatives of the huge family *Cichlidae*. In the home-waters of tropical West Africa, in the Niger, Congo and Kribi deltas (from the last-mentioned it takes its name) it attains a length of four inches while home-bred specimens seldom exceed 3½ inches.

P. kribensis are very colourful fish, the upper part of the male's body being dark blue with a stripe crossing the body from the mouth to the tail. The lower part of the body is lighter and a large region about the belly is wine-red, the chin being blue. The upper part of the tail has two, three or even four black spots ringed with golden-yellow and the dorsal fin of the male carries one dot. The female has only one dot on the tail and two or three on the dorsal fin. The anal and ventral fins of the male are violet but the latter are edged with blue. The dorsal fin is blue with a wide gold edge which is in turn edged with red.

P. kribensis is one of the most popular of cichlids because of its gorgeous colouring in both sexes, its modest size and its fairly peaceful behaviour. The fish can be kept in the community tank at a temperature of 78 deg. F. but lower and higher temperatures can be endured. Its only disadvantages are that it is fond of digging into the bottom media and it is sometimes a fin-nipper, especially liking the fins of long-tailed fish such as veil tail guppies, angels and Siamese fighters.

It is advisable to have a well-planted tank or to give the fish retreats in which they can hide. Keeping a number of pairs together in the same tank is not advisable because this would lead to battles with their own kind. Water should be soft—about pH 6.5 to 7.5. As for food: they take "everything"—worms, *daphnia*, *algae* and all types of dried foods. They must have some sort of live food sometimes, otherwise wasting disease (tuberculosis) occurs.

For breeding, a ten-gallon tank or larger is required with a gravel bottom and some large plants in the background with a flower pot or some such object for spawning. When I bred them tap-water was used and the temperature was raised to 80 deg. F. False matings were noticed and the pair even visited the spawning site (a flower pot in this case). Biting or other rough courting tactics were not observed as in the case of many cichlids. When the pair were ready for spawning, both swam into the flower pot and cleaned the underside of it. Then the female laid a few eggs by turning on her back and pressing her belly to the flower pot's surface after which she left the spawning site to let the male fertilise the eggs in the same manner as the female had laid them. This process is continued until the female has laid all her eggs.

Caring for the brown-coloured eggs is the duty which the female usually regards as solely her own. Sometimes parental care is exercised by both sexes but in most cases it is best to remove the male after spawning.

The fry become free-swimming after three to four days and must be provided with infusoria, then brine shrimp and finely sifted *daphnia* and then they can take normal adult foods. When free-swimming the young remain in a swarm near their parents. Pairs can spawn when about eight months old and about a hundred eggs are usually laid.

Green Water

by A. Boarder

IT is probable that few pondkeepers have not been troubled at some time with green water in their ponds. Any freshly constructed and filled pond in the garden is almost certain to have the water turn green within a week or so. Changing the water is only a temporary measure as very soon after the green returns, and often thicker than ever. It has been suggested that this happens more often in an acid water, but most waters will have a quantity of green water at certain times of the year.

The green is caused by a tiny plant known as Algae. This is a low form of life and may be from such a type that most of our present vegetation sprung indirectly from it. It can multiply at a very fast rate given the right conditions and so even if a little is in the water one day, the whole mass can be smothered with it within two or three days. Some water appears to suit the spread of the Algae more than others. I have had several tanks of water outside and often only one or two are infested with Algae. To all outward appearances all the tanks are the same, and yet one among them can be full of green Algae whilst others remain quite clear. If fishes are put in a tank or pond it is probable that Algae will thrive in such water.

The tiny plants contain chlorophyll and this can only function in light. Therefore if water is kept in the dark it will never produce green Algae. This then is one of the main considerations for the pondkeeper who is troubled with the Algae. A tank of water, even in a greenhouse, would never grow any green Algae if it was kept covered, say in a year or more. This gives the pondkeeper something to work on as the more light he can withhold from the pond the less likely is it that green Algae will form. Naturally he wants to see the fishes in the water and so it is essential to deal with the trouble gradually by introducing such water plants that will choke out much of the sunlight.

Not only will plants keep down the sunlight but by their rapid growth they can overpower the green Algae and prevent it from growing too vigorously. Water lilies are one of the finest plants for covering part of the surface of the water. Their large leaves lie flat on the top and so provide much shade to the water underneath although not cutting out the light entirely.

Another very fine plant for the same purpose is duck weed, *Lemna*. This can multiply rapidly and can soon cover a pond. By its method of grouping together it is able to shade a considerable amount of surface area. Also it is easier to introduce into the pond than a water lily which would take some time to get established enough to provide much cover. Many types of fishes including goldfish will eat duck weed and so if a number of fishes are in the pond it may be necessary to add more duck weed from time to time. Once the duck weed has done its job and the water is clear it can be removed easily by flushing with a hose to one side of the pond when it can be raked out.

One important point to remember with regard to green Algae is that young fry will eat it, at least when they are tiny. As they grow to about a month in age they do not seem to eat it at all. Many breeders feed this Algae to their fry and whilst it may be quite safe in the early days it can be overdone. While the water appears to be green but still clear enough to see a fish three inches under the surface it is safe but once it gets too thick for this trouble may ensue. Very thick green water appears to be very dangerous especially in warm or thundery weather. At night the danger is increased. During the daytime when there is plenty of light the Algae give off plenty of oxygen and so many fishes are improved in health if ailing when introduced to such water. However at night the Algae do not give off oxygen and if in too great quantities can foul the water badly.

Any tank found to have become too thick with green Algae should be cleaned out as soon as possible or the fishes could die. Another danger point is reached if, from an unknown reason, all the Algae suddenly die off. This can so pollute the water that it can kill the fishes.

The Algae can be killed by washing a bag of copper sulphate crystals about in the water every day for a few days, but this must not be done when there are fishes in the pond as copper is deadly to fishes. Another way to clear a pond of green water is to make a fairly strong solution of permanganate of potash and pour it into the pond, swirling it about so that the strength is distributed. Do not add the crystals direct into the water or fishes could be injured. A solution which is not too strong will not harm the fishes.

Another way to reduce the green Algae is to have plenty of under-water oxygenating plants. It is very rare indeed to find a well planted pond which has been set-up for some time to be infested with Algae. The Elodeas such as *E. canadensis*, *Egeria densa* and *Lagarosiphon major* are all very good for choking out Algae. They in turn can become too rampant and may need pruning, but this is an easy task compared with the trouble which too much Algae can give.

In conclusion it can be stated that green Algae can be controlled by cutting out the light from the water by surface leafing plants or by under water ones, by not over-feeding the fishes and so encouraging the growth of the Algae and by trying to keep the water as pure as possible at all times.

Waterlife Pests and Friends

The Medicinal Leech

by Bill Simms

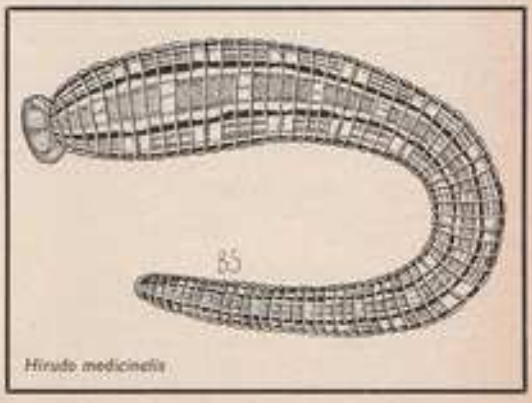
THE sight of one of these blood-sucking worms at its full size of 4–6 inches would cause alarm if found in the aquarium but when smaller it might well live there for some time without being noticed. While it is very small it does do a little good, for it lives on the smaller living creatures in water—many of which are pests.

Later, however, it graduates to larger creatures, including tiny fishes, and from then on becomes progressively worse, sucking blood from anything, including man.

There are thirteen kinds of leech in Britain, some as large as the Medicinal Leech, but many much smaller. Some can swim freely in the water, like the present species, while others only crawl. Most of them can live for a full year on one meal, which is why they were always so readily available to Doctors in the old days.

Leech eggs are laid in cocoons but the various species differ in their care of them. Some are laid on plants and others are carried around until the eggs hatch. Some babies even travel with the parents for a time after that.

Undoubtedly all leeches are pests to fish, and should be removed from any aquarium.



Hirudo medicinalis

our readers write

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

No plants

I AM writing to ask you if you have any plants for my goldfishes as I find in Ripon that no one seems to have any plants or much of anything else for that matter. We are very worried in Ripon and Harrogate for I have tried all over the place for plants. I do hope you can help me.

Yours truly,
N. B. Hillery (Mrs.),
73 Priest Lane,
Ripon, Yorks.

Editor's note: Can any readers in Ripon and Harrogate offer any suggestions?

Further Corrections

P. F. CAPON in his correction of R. E. Macdonald's article on "Gas Embolism" also appears to have little chemical knowledge.

The scale to which he refers is the pH scale which extends from 0 to 14, and is derived from the hydrogen ion concentration in the water.

He is also incorrect in stating that "to remove any carbon dioxide from calcium carbonate it is necessary to heat it to between 800 and 1,000 degrees C." If Mr. Macdonald's water were sufficiently acid then carbon dioxide would be released from the calcium carbonate leaving behind calcium hydroxide which, because of its slight solubility in water, would give an alkaline reaction to the water. Thus Mr. Macdonald should have said dangerously alkaline not "dangerously acid" when his figure of "perhaps pH 10" would have been correct.

Yours faithfully,
B. Cass,
Selby, Yorks.

pH explained

THE symbol pH is thrown in in articles on fish breeding quite often but I wonder how many people know what the pH of a solution is? The pH, in fact, stands for the potential hydrogen in the solution. This is roughly a measure of the number of ions (electrically charged atoms or groups of atoms) in a fixed volume of the solution. The hydrogen ion concentration of a normal solution of a strong acid is about 1(10^{0}) gram-ions per litre but that of a normal solution of a strong base is 10^{-14} (1 divided by 10 followed by thirteen noughts) gram-ions per litre. This range is so great that a logarithmic scale (the power of ten in this case) is used. Thus the pH of the above acid is 0 and the pH of the alkali is —14 which is taken for convenience as 14.

Acids in solution ionize to yield hydrogen ions (for convenience H^+) whilst alkalies yield hydrogen ions (OH^-). As one falls the other rises. Therefore it can be seen that when a solution is neutral there are equal numbers of OH^- ions and H^+ ions so the pH of the solution is 0+14/2 which is 7. Thus solutions of pH less than 7 are acid and more than 7 are alkali. I hope this helps Mr. Macdonald to remember which pH is acid and which is alkali.

Yours faithfully,
P. S. Mackinnon,
31 Esmead,
Chippenham,
Wilts.

The "Aquarist" in Singapore

DUE to being a member of the armed forces, my experience of our hobby has been rather limited to the non-practical side of things. Nevertheless, I am very keen on all aspects of aquatic life, and, not unnaturally, I take an interest in the aquarists, their views and the fish they keep, in the various countries of the world I happen to visit.

At the moment I am serving on H.M.S. Hampshire on the Far East Station.

In Singapore the hobby is a very popular one and the majority of shops dealing with tropical fish are not as we know them back home. It is a very common sight to see whole clusters of tanks on the very roadside. The tanks, in tiers, form a large rectangle with the backs of the tanks to the outside. Access for viewing and purchasing the fish, is simply through a small gap between a couple of tanks!

One such shop I visited recently was quite well-stocked with tropicals and fancy goldfish (notably black moors), and

I recognised many of the species. At the time I happened to have about two years supply of back-dated copies of the "Aquarist," and these I proudly showed to the two young Chinese, who kept this little stall. The results were amazing —before I knew it my magazines were scattered all over the floor, the Chinese, keenly absorbed in the pages, pointing excitedly to species they recognised. Somehow I think we'll soon have two young Chinese enthusiasts as subscribers.

As a reward for introducing our magazine, I was given a personal tour of the tanks. Although I didn't agree with it, (but I minded my own business) the dealer also staged a fight, apparently for my amusement, between two adult Jewel Cichlids in a large bare tank. They fairly tore into each other, but fortunately they were separated before serious damage occured.

Another thing that surprised me was that many of the roadside monsoon ditches contained small freshwater fishes. On inquiring of the dealer I found that they were "wild" Guppy's and this particular shop often used them as a livefood for the more fortunate stock.

My visit turned out to be very interesting and I hope to continue my little surveys in future countries. Soon I will be demobbed, and I will be able to put my hobby to more practical uses and join the Portsmouth Aquarist Societies. By the way, not inappropriately I'm also a diver!

Yours Sincerely,

A. J. Partridge.

Gas Embolism and Freedom of Speech

P. F. CAPON'S letter (The Aquarist, August 1966) in reply to R. E. Macdonald's article "Gas Embolism" is an example of aggressiveness and arrogance which should not be tolerated in a Magazine like yours.

Any Aquarist should be free to write what he likes without fearing to be attacked in such a way.

I hope that Mr. Capon reads the reply given by Mr. E. R. Ward in connection wth the same subject, which will show him how an allegedly inaccurate statement can be rectified in a dignified way.

In my opinion it is quite obvious that Mr. Macdonald meant to say that a pH of 10 is a dangerous alkaline water.

Furthermore Mr. Macdonald is quite correct in stating that some plants are able to make use of the carbon dioxide in calcium carbonate which is accomplished by ion exchange with the formation of calcium hydroxide the classical example being Elodea.

(See: Ruttner: Oestr. Bot.Zisch. 94/95 1947/48., Handb. d Pflanzenphys. V/1960., Schweiz. Ztschr. Hydrol. 22/1960., Grundr.d.Limn. 1962., Arens: Planta 20/1933., Jb.wiss.Bot, 69/1928., Minder: I.V.L.1/1922).

W. Herzog,
University Estate,
Cape Town.

Editor

While contributors are free to express their opinions they do of course, expose themselves to criticism by readers who are afforded equal facilities for expressing themselves in these columns.

continued from page 131

Some Forgotten Fishfoods

by J. H. Vosper

hung on a length of stick for oven drying, the liver being more easily handled if cut while in a frozen condition but in this case it should be dipped into boiling water before being dried.

Perhaps the most tedious task is that of pounding up the dried fragments after wholesale drying, but this can be relieved if the material is passed through a mincer prior to being dried, after which it will crush up far more easily since the hard fibres of the flesh are broken down. Spread out thinly and evenly on flat baking trays, the food will not take long to reach an appropriate crispness.

A better variation is to continue the mincing until a fine mush is obtained, to which finely ground oat-meal is added as a thickening agent in order to produce a consistency something like that of tooth-paste. This is placed in a grease-proof, plastic or other bag, of which one corner is cut off to allow the horrific mixture to be piped out in strips onto grease-proof or rice paper, of which the latter is to be preferred since it need not be removed at any stage but can be eaten by the fish eventually. The strips are marked across to provide suitable breaking points, while holes can be bored by means of a bluntly-pointed dowel rod if it is intended that the blocks be hung in the tank on a piece of cotton. The strips are dried off in a moderate to low oven, this depending upon the thickness of the strips for they must be dried thoroughly and evenly.

The snag is that the blocks tend to disintegrate in water so some care is required to avoid fouling the tank, yet this can be avoided to a great extent by adding albumen to the original wet mixture. This may be purchased separately or the white of an egg can be used, but in either case the result is that the material is bound together in a satisfactory manner while still softening enough to allow the fishes to feed by pecking at the blocks.

The experiment of adding albumen was first tried, I believe, by W. T. Allen (then of Forest Hill A.S.) and I would like to quote from the comment added to his original notes:

"... the somewhat strong odour these methods engender may cause some dismay to the household; it is therefore recommended that husbands take their wives out shopping while the oven is in use. The aroma clinging to curtains etc. will wear off in a fortnight or two, while little if any permanent harm is done to human lungs inadvertently inhaling the effluvium."

As well as the animal flesh mentioned above, the following are known to have been utilised:

Shore crab	Daphnia
Thornback Spidercrab	Brine shrimp
Common Blennies	Stickleback
Lesser Spotted Dogfish	Insects (various forms)
Winkles (various species)	Kidney
Limpets	Sweetbread
Common Dog-whelk	Lean beef, etc.
Mussels	Starfish roe
	Shore crab roe

Useful plants for the fish house

Russian Vine

Polygonum baldschuanicum, climbing an drain pipes and stretched twine, planted in soil beneath gravel path, makes attractive frame to windows

IN previous articles under the above heading, I have dealt with indoor plants for the fish house. What about the outside of your fish house? Does it present a long, dull cement brick wall which does nothing to enhance the garden? An attractive cover for such a wall can be had by planting a Russian Vine, *Polygonum baldschuanicum*. A word of warning before proceeding—don't plant this plant in a small confined garden near any other plants. I know of few more rampant, rapid climbing plants.

Polygonum baldschuanicum is a deciduous climber which, from spring to late autumn, is clothed with attractive green leaves which are accompanied from about July onwards, by a host of small white flowers which form almost a waterfall of white down the face of the wall. The plant is not particular about soil or site, but a south facing wall seems to be ideal. A small wall can easily be covered in one, or at most, two seasons. The twining stems need something on which to climb but this need be nothing more than stout cords stretched from a peg in the ground to, say, a drain pipe. Once the stems get twined round something firm such as a pipe, they will support themselves, later stems twining round the original ones even if the cord rots away. Plants should be trimmed regularly, especially at the top as probing shoots can soon grow beneath roof slates or panes of glass thus causing damage.

Plants can be purchased for a matter of shillings and are easily propagated from stem cuttings about 9 in. to 12 in. in length. They will be found advertised in most good nursery catalogues. One plant will soon cover and soften the harsh look of a bare fish house wall but remember not to plant one near any other climbers or shrubs or they will quickly be smothered. With sensible pruning and training, especially at the top, the plant can be kept within bounds. An attractive exterior to the fish house is surely just as important as an attractive interior.

(outside and in)

Venus' Fly Trap

Venus' fly trap, Dionaea muscipula

IF you have an old goldfish bowl which is no longer in use, and would like to grow one of the most interesting plants in the plant kingdom, why not try the Venus' Fly Trap, *Dionaea muscipula*. Of all the plants available for the pot plant grower, this one approaches most nearly the 'man-eaters' of science fiction writers, which intrigue both young and adult alike. Its needs are easily met and an old goldfish bowl or sweet jar is an ideal container in which to place the plant.

The plant comes from Carolina in America, and needs a humid atmosphere which can be supplied if the plant is kept in a fish bowl. It grows well in a flower pot, about 3ins. size to start off with, which has a crock at the bottom drainage hole, and is filled with fresh sphagnum moss. *D. muscipula* is planted in the moss with its swollen bulb-like base just beneath the level of the moss in the flower pot. Coming from areas where there is little plant food in the 'ground,' the Venus' Fly Trap has adapted itself to obtaining its food for growth from catching insects in its specially adapted leaves which have evolved over thousands of years. It is, hence, known as an insectivorous plant, and for this reason should not be grown in a rich soil, or given any form of plant foods such as liquid fertilizers. These will only kill the plant or cause it to stop producing its traps. Although one would hope that a well run fish house would not contain any such 'insects,' the plant will still thrive without such food. If you do happen to trap an insect (not one killed by insecticides) it may be 'fed' to the plant as may small scraps of raw meat. The latter must be small, and should not be fed very often as leaves may wither and die after feeding on such pieces of raw meat.

To keep the plant healthy and growing it must not be allowed to dry out and must be kept damp at all times. This can be done by standing the pot in a fish bowl with

Continued on page 147

Continuing from a related series of articles appearing in the Aquarist as:

GOLDFISH—Rearing the young

by A. BOARDER

MY previous articles dealt with the spawning and hatching of the goldfish. The next step is the rearing of the fry. For about a week they will only take very fine foods such as *Infusoria* or the liquid fry food. This latter is obtainable in two grades, one very fine and one slightly larger. This larger food is intended for livebearing tropical fishes and so is suitable for the fry once they are a week old. The next two weeks are vital in the lives of the fry as they can grow apace providing they get all the nourishment and warmth they require. It is not easy to progress in the correct stages of feeding as it is important that the food is increased in sizes gradually. If too large types of food are given at this stage it will remain uneaten and so can pollute the water.

The rate of growth among the fry will depend not only on the amount of food available but also on the temperature of the water. At 70°F, they can eat well, digest their food fairly quickly and so be ready for more food. When the water is cooler the fishes are quietened down considerably, taking longer to digest their food and so needing less. It may be necessary to use aeration when the water is warm as it is well known that warm water holds less oxygen than cooler. Also the fry cannot eat well unless the water is well oxygenated.

A slightly larger food can be the micro worms if available. If these are not to be obtained then the use of white worms can be strongly recommended. However, it is necessary to mash these up well so that the small fry can eat them. I find that the worm shredders, as advertised in "The Aquarist", are very useful for mashing the worms up. Do not over-feed with these unless it is seen that the fry are feeding well on them. If the white worms are not available then some dried food can be given. A good form of dried food can be used as long as it is reduced to a fine, dust-like powder first. Sprinkle a little on the surface of the water and then watch to see if the fry are taking it. If it is eaten in a short space of time a little more can be given.

Providing the fry continue to eat well some changes of food can be tried. Continue with the mashed white worm and add scraped meat or liver as well. A little mashed live food can be given each day and the remainder of the food can be dried. This is the time to make certain that over-feeding does not take place. This is especially important where dried foods are concerned. More fry are lost every year by the aquarist giving too much food which cannot be eaten and then pollutes the water. Even one day can mean disaster, as it seems that the fish are eating well and so more food is given. If the weather is warm it is possible for the water to be contaminated within hours. The fry cannot eat when this is the case as foul gases are present and little oxygen is present in the water.

I find that it is a good plan to stop feeding altogether once a week for a whole day. This gives the fry a chance to eat any *Infusoria* which is almost sure to be present in the water. Once the fry are a fortnight old it is a good plan to change a little of the water about every two days. A large quantity need not be removed but enough to enable some fresh to be introduced. This water must not be straight from the tap. If no mature water is available some tap water should be kept in a container in the open air so that it becomes free from chlorine and is therefore safer for the fry.

If any pests can be seen in the fry container it is essential that they be removed at once. If the eggs were laid in a pond it is almost certain that there will be some pests present on the plants which held the eggs. Snails are not a danger to fry once they hatch, but only to the eggs. If any newts were in the spawning pond it is possible that some of their eggs would be among the water plants. The tadpoles would hatch out in the hatching tank and although they are very sluggish when first hatched, they soon become very active and can eat the fry. There are other possible pests which may be present. There may be the larvae of water beetles, dragon flies and other insects. Then it is possible that there are some water lice, (*Asselus*), also. These may be a good food for some fishes when of a fair size, but it it occasionally found that they can attack and devour small fishes.

It is no easy task to remove any pests from the hatching tank. I find that the best way is to make ready another tank with mature water. Make sure that there are no pests of any kind in it to begin with. Then carefully remove any water weed from the hatching tank. This should be placed in another container for a time as it is almost certain that there will be a few fry among the plants. Now take a small white-lined saucepan and dip out some of the water carefully. It is probably that most of the fry will swim to the bottom and the first pan or two of water can be thrown away. Then when some fry are seen the pan can be gradually tipped into the fresh tank so that the fry can be seen as they go steadily over the top. It is then possible to count the fry and to catch any pests which may be present.

At this time it is essential to ensure that the fry get plenty to eat at all times. However this does not mean that one must be forever adding dried foods. Be very careful with this and try to give as much live foods as possible. At a month old the youngsters will begin to look more like fishes and can be sorted out a little. The preliminary sorting will depend on the type of fishes bred. If they are any of the double-tailed varieties it is quite easy to sort out any which have a single tail. The better ones can then be given more space. This space is most important as I consider that it is almost impossible to breed a large number of healthy fishes without sufficient swimming space.

It is advisable to keep some water plants in the fry tank and when changing over into a fresh tank it must be made certain that the water plants which are introduced have no pests on them or eggs which could hatch out later on. Remember that the secret of rearing plenty of healthy fishes is to see that the water is always pure, warmer than the pond water and well oxygenated. With the correct feeding and attention little will go wrong.

Dytiscus marginalis—the fearless

by F. WILMOTT

THE Great Diving Beetle (*Dytiscus marginalis*) has always caught the imagination of naturalists. Also its dark brownish wing-cases, with the yellow band which surrounds them and its thorax, must be familiar to large numbers of other people.

A powerful swimmer, *D. Marginalis* is quite fearless and will attack creatures a good deal bigger than itself. In fact it seems that its only weakness is that it sometimes mistakes shiny surfaces for ponds when making nocturnal flights. And I have myself found this beetle awkwardly trying to move about on a wet tar-sprayed road prior to resuming its flight—this awkwardness caused by the fact that it can only work its powerful hind legs in unison.

The Great Diving Beetle obtains its oxygen supply from the air, and air-holes or spiracles are placed round its body, the two pairs nearest the tip of the abdomen being larger than the others. When it wants a "fill-up" of air *D. Marginalis* rises to the surface and thrusts the tip of its abdomen through the surface-film. At the same time it raises its wing-cases slightly and contracts the soft top of its body sufficiently to store a further supply of air, and this supply is then taken as required by using the smaller spiracles.

In addition to being able to swim powerfully this beetle is a strong flyer and is capable of travelling considerable distances when migrating from one pond to another in search of food or of a place to deposit its eggs. And if one is close to a pond at dusk quite a loud "plop" can sometimes be heard as *Dytiscus Marginalis* dives steeply onto the surface of the water, rather like a tiny meteor or a visitor from outer space!

Although so fearless in the water the Great Diving Beetle does not (in my experience) attack if the hand is merely placed close to it, but it has been stated that it will sometimes attempt to give one a nip with its powerful mandibles if actually held. It also exudes a bad-smelling liquid if handled, and it is possible to prick one's finger slightly on the spiny projections on the under-surface of its body.

Dytiscus marginalis, the male is on the left

continued from page 145

Venus' fly trap

about ¼in. of gravel, and 1in. of water in the base. The plant should be kept watered when the water level in the bowl sinks due to evaporation, but it should not be swamped as it will rot. Normally it does not have a very extensive root system because it obtains its food through its fly-catching leaves.

The plant does not grow very large but may flower in July or August, producing small white flowers on heads held about 9in. above the plant. Ripe fertilized seeds may be germinated in the Spring under humid conditions. Adult plants should be placed in a sunny position where the traps will develop a rich red colour as they mature.

The plant's attraction lies in its modified leaves. These bear a flattened petiole called a phyllode at the end of which is the lamina in the form of a trap which has a fold along its midrib. The edge of the trap has a row of spikes on either side and the insides of each half of the trap bear three trigger hairs which, when touched by an attracted insect, cause the trap to close quickly. The spikes along the trap edges close over each other like interlocked fingers and prevent the insect from escaping. Trigger hairs, when touched, cause cells along the lower edge of the midrib to fill up with water thus closing the trap. The reddish inside surfaces of the trap emit acid and enzymes which dissolve the trapped insect. Later the trap opens to expel the tough parts of the insect which are of no use as food, e.g. wings.

Plants of the Venus' Fly Trap are not expensive. In a 5s. 0d. polythene packet which I purchased were two plants and enough sphagnum moss in which to plant them, in 3in. pots. They can be found advertised in gardening magazines, and make one of the most interesting and easily cared for plants which can be grown in a fish house which has windows to allow the entry of sunlight.

If the trigger hairs of the trap are touched with a pencil point or other suitable object, they will close to order. Make sure that visitors to the fish house have a look at the fish and don't spend all the time with this plant.

Science to aid Salmon

by MICHAEL LORANT

SONIC research engineers of The Boeing Company in the United States are currently conducting scientific studies on behalf of the U.S. Fish and Wildlife Service in order to find out *what shakes a salmon?*

The studies involve the use of underwater vibration to frighten fish away from danger spots such as pumps, turbine intakes on power dams, and irrigation sluiceways. The aim is to develop a new underwater-vibration device that would guide young salmons away from potential death traps.

John VanDerwalker, research biologist for the Fish & Wildlife Service, is observing the studies. He also provides fish for the experiments. Melvin Mackey is the Boeing test engineer responsible for the facilities and electronic equipment required for testing, data collection and analysis.

Fingerling losses have been a grim reminder that trifling with the environment of a natural resource is a tricky business. Natural attrition on salmon eggs and fingerlings

VanDerwalker shows the test tank to engineer Melvin Mackey

The sonic probe is adjusted for final position by VanDerwalker.

leaves a small margin for successful propagation of the species. Any additional man-caused attrition can seriously affect the size of subsequent runs.

Chinook salmon runs already are at a precarious low. So far it has been impossible to make a significant improvement in this situation, despite various conservation approaches.

Since Boeing uses vibratory equipment in its laboratories to test aerospace components, the Fish and Wildlife Service asked the company to conduct a research programme to determine what actually happens when fish are exposed to vibration.

Considerable research is needed to determine the particular levels of vibration most effective as fish frighteners, and whether a particular vibration frequency of specific fish—called the *natural resonance*—would affect the entire fish, certain internal organs of the fish, or even fish of different sizes and different species.

For example, if a certain frequency would affect only the air bladder of fish, this might cause them to rise to the surface of the water where they could be guided safely past a danger point.

The studies are being conducted with fingerlings (young fish 3 to 6 inches long) placed in an endless wooden trough of water about 3½ feet deep and 4 feet wide which forms a rectangle. The vibration equipment is located inside the rectangle. Water is pumped through the trough to simulate the flow of water in a stream. The fish lie in the water with their heads pointing "upstream" until alarmed by sonic vibrations. Their efforts to escape the vibrations are carefully observed when they break their pattern.

Specific test areas in the tank are subjected to vibrations and monitored to determine the frequency and decibel level that causes fish reaction to the sound. Motion picture photographs of fish reactions are taken during the tests and data is verbally recorded on magnetic tape.

About 100 fingerling Chinook are in a typical test group. During a three-week test programme they are subjected to a multitude of sonic vibration levels and frequencies. Preliminary results indicate the fingerlings show their first reaction when the frequency reaches 25 cycles per second and 150 decibels.

The tests will continue with gradual scaling up to 500 cycles and sonic levels of 110 to 150 decibels. There is indication that pulsed vibrations are more effective than a steady input, and the preferred system will be determined.

All the scientists would need is an effective range of 3 to 4 feet for a technological breakthrough as it would give them a range of 6 to 8 feet if a sonic vibrator would be mounted on each side of a pump, water inlet or sluiceway. This then could lead to the safety of salmons in a big way, without building louvres—or fish fences—the cost of which would be prohibitive anyway.

Melvin Mackey at sound control centre

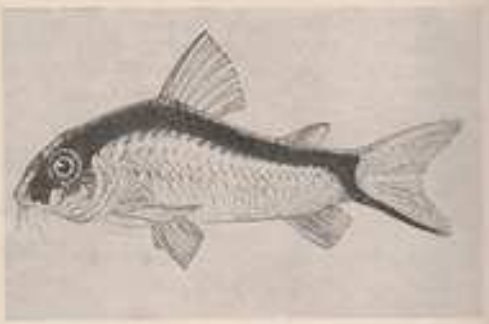
. . . Whoops! Speaker (dark spot) emits vibration, and fish scatter

All's well as small Chinook Salmons ignore silent speaker

Corydoras arcuatus

by Jack Hems

CORYDORAS ARCUATUS is an armoured catfish (Fam.: *Callichthyidae*) of rare beauty and charm. It comes from north-western Brazil and was first seen in dealer's tanks in England in 1938. It is a small species that attains about 2 in. in length, with an ivory coloured body, darker above than below, overlaid here and there with a mauve to greenish sheen. But what immediately catches the appreciative eye is a bold black marking that extends from the side of the mouth, through the golden iris of the eye and along the curving dorsal ridge, to the root of the tail, where it takes an abrupt downward turn and then continues narrowly onto the lower lobe of the forked caudal fin. All the other fins are clear.



Like most of its congeners, the arched corydoras (to give this fish its common name) flourishes best in a thickly planted tank where it can scurry over the compost from one green thicket to another in search of food; in a thinly planted aquarium which permits the entry of too much (to the fish's liking) bright light, it will cower most of the time in some corner until the light fades, or is put out. It is to be pointed out, however, that a lot of eating is done under any conditions after dark. In fact, when the species is placed in the company of other fishes in a community tank it is a good idea to introduce some food last thing at night to make certain that it receives its proper share. In the natural state, *C. arcuatus* lives on tiny crustaceans, tiny worms, and the like, but in the aquarium it may be given anything normally given to a non-faddy omnivorous fish. All the same, to keep this catfish in really good health, it is important to include some live food or finely shredded raw or cooked red meat in its diet.

Despite the fact that the arched corydoras is found in the wild nearer the equator than the tropics of cancer or capricorn, it has a wide temperature tolerance and will stand a slow but not protracted fall to about 66°F. (19°C.) without suffering any harm.

Cryptocoryne balansae

by B. Fry

THIS singularly beautiful and not always easy to come by plant, which first appeared in dealers' tanks some ten years ago under the trade name of "*Cryptocoryne tophongii*", is indigenous to Thailand. The strap-shaped leaves, which are held more or less erect on stoutish stems and taper gracefully to a fine point, attain a length of about 10 in. and a width of about ¾ in. They are grass-green in colour and crinkled or dented all over. The edges are wavy.

As the upstanding foliage of *C. balansae* never becomes ungainly, the plant is ideally suited to growing in rear corners of a tank to hide the metal uprights, or for massing in the background in which position it does a lot to enhance the charm of smaller plants and the colours of the fishes.

Once established *C. balansae* will flourish very well in any 12 in. deep or preferably deeper tank maintained at a temperature in the middle seventies (°F.). But it does need a little encouragement and special treatment at the start. For instance, it is essential to plant it in partial shade. Further, some soil to feed it is necessary at the roots. (Large crumbs of dried clay or non-fibrous loam pushed into the compost within a few inches of the crown will do fine.) It is also important to give the plant soft neutral to slightly acid water.

If left undisturbed for any length of time a large plant of *C. balansae* will soon surround itself with pale green offspring. It is unwise to give these tender growths a separate existence until they are reasonably well developed, and even then it is advisable to coax them along for a few months in a pan of gritty soil raised near the surface before you plant them out in deep water.

Jordinella floridae

by "Jaywardene"

THE American Flag Fish (*Jordinella floridae*), a native of the swamps and streams of Florida and Yucatan is a member of the Killiefish group of fishes, attaining an approximate body length of 2½ inches in the male and 2 inches in the female. The species is omniverous in diet, though has an intense liking for soft vegetable food, algae from the glass sides of the aquarium or, alternatively, boiled spinach, being accepted with relish.

In disposition it is an extremely aggressive, ill-natured fish, teasing to shreds the long flowing finnage of such fish as the guppy (*Lebistes Reticulatus*) and Angel Fish (*Pterophyllum eimekei*) if so maintained in the same aquarium. Normal water temperature should be in the range 68–72°F., raised to 75°F. for breeding purposes.

The basic body colouring of the species is of a greyish-green, the male being attractively marked with horizontal rows of green and red scales, his fins being much longer and pointed than the female. The dorsal fin is fawn, with a black spot appearing at its base.

For breeding purposes both fish should be separated in the normal manner and conditioned for a period of 7–10 days on lavish amounts of live, meaty foods such as Tubifex, white worm *Daphnia* etc. The breeding tank (24 in. × 12 in. × 12 in. being ideal) should be set up to include mature tap or rain water, acid to neutral in nature, pH 6·8–7·00. Clean sand or compost should carpet the aquarium bottom, being thickly planted at one end with bush aquatic vegetation examples of which are *hadrigia*, *myriophyllum*, *elodea densa*, and *cabomba*.

Spawning usually occurs around dawn, the male making a depression in the sand, amongst the plants, where both sexes pair side by side, the male apparently curling his anal fin around the female in order to assist her in the expulsion of her eggs, which he immediately fertilizes. Spawning continues for a length of up to 2 hours, when, upon termination, as many as 100 eggs will have been duly expelled and fertilized. At this stage both parents should be removed.

Hatching occurs within 7 days at the breeding temperature of 75°F. previously stated, the young fry being raised on Infusoria, followed in time by brine shrimp and micro worm before moving on to the normal foods suitable for adult fishes.

Ceratopteris thalictroides

by B. Whiteside

GIVEN the correct conditions for growth, few aquarium plants can equal the growth and reproductive rate of the Indian ferns. Anyone, having read the several sub-backed American books on Guppies, will have noticed the prominence given to these plants for the Guppy aquarium.

These delightful plants have a number of common names such as Indian fern, Sumatra fern or water sprite. Two varieties of the plant are normally available; one with broad leaves, and one with narrow leaves. The plant's botanical name is *Ceratopteris thalictroides* and it belongs to the plant phylum *Thallophyta*, to which belong also the algae, fungi, mosses, ferns etc. Its family is *Parkeriaceae*. A distinct species of the fern is the floating form, *Ceratopteris cornuta*.

The plants reproduce by spore formation as is common in ferns, but their main method of reproduction for the aquarist is by the formation of young plantlets on the edges of mature leaves. These may be allowed to break free from the parent plants, when they grow larger and float on the water surface. When large enough, the young plants of the underwater form may be planted in the gravel of the aquarium.

Adult plants of *C. thalictroides* produce their new leaves in typical fern form, the new fronds unrolling from the base of the plant. Even adult plants do not produce many roots and the plant should have its crown just resting on the gravel surface.

I have found the Indian fern to grow very well in calcium carbonate-free gravel (undergravel filter) in water at a temperature of 78°F, with an acid reaction, pH 6·6–6·8 and a water hardness level of 6°DH–8°DH. The plant grows well under artificial light, mine receiving between 6 and 8 hours of tungsten bulb illumination per day. I use a 40 watt bulb over an 18 in. × 10 in. × 10 in. tank. The petiole (stalk) of the leaves reaches about 3 in. to 4 in. in length and the lamina (leaf blade) about 12 in. in length, in the fine leaved form, grown under suitable conditions. Some of the leaves of my plants grew right out of the water, producing a fine carrot-like top growth in a humid atmosphere.

If you can supply this plant with slightly acid water conditions it will be an excellent investment, plants growing so large that two or three of them will fill an 18 in. tank in a short time. When the plants get too large or spread out, they can be replaced by some of their numerous offspring. I have had little success with the plant in fairly alkaline water where it soon lost its leaves and died, or its rate of growth came to a stand-still. For about 1s. 6d., the plant is excellent value, if it can be given suitable water in which to grow.

Aquaria and zoo guide

CHESHIRE

North of England Zoological Society, Zoological Gardens, Upton-by-Chester, Cheshire. Admission charge—to Gardens: Adults, 4s.; children under 14, 2s.; to Aquarium, 6d. Open daily throughout the year from 9 a.m.-dusk. Party terms (parties of 25 and over): Adults, 2s. 6d.; children under 14, 1s. 3d. Aquarium admission 6d. No reductions for parties. Description: Mainly tropical freshwater fish. 178 species of fish. Collection of fish, 2,400. Recent acquisitions include green discus (*Symphysodon aequifasciata aequifasciata*) and some rather unusual catfish from South America. It is hoped shortly to develop a marine section in this Aquarium, but this is only in the experimental stage at the present time.

DERBYSHIRE

Pan's Garden—Zoological and Botanical Gardens (including an Aquarium), Ashover, Chesterfield, Derbyshire. Admission charge—Adults, 2s. 6d.; children, 1s. 3d. Open 11 a.m.-dusk every day of the year. Description: The aquarium section of the Zoo comprises 12 tanks and a floor pool, and includes coldwater, tropical and marine sections. We endeavour to exhibit turtles, such as axolotls, clawed frogs, piranhas, paradise fish, dragon fish, seahorses etc., rather than the more common species.

DEVON

Exmouth Aquarium, Sea Front, Exmouth, Devon. Admission charge—Adults, 1s. 6d.; children, 6d. Open 10 a.m.-dusk every day, May to September; week-end during winter. Party terms on application. Description: 30 tanks ranging from 24 by 12 by 12 ins. to 17 by 7 by 10 ft., housing our giant turtle measuring 5 ft. long by 3 ft. Seahorses, local fish, also tropical and coldwater exhibits. Seawater is pumped up from the sea through a 700-ft. long pipe. Aquarist's shop adjoining.

Paignton Zoological and Botanical Gardens, Paignton, Devon. Admission to Zoo, 5s.; Aquarium, 6d. Open daily at 10 a.m. Party terms: Reduced rates for parties over 30 into Zoo. Description: Tropical plant house, reptile house and aquarium. 37 fish tanks showing 350 fish of 43 species, 7 terrapin tanks and 25 reptile cages 174 reptiles of 42 species. Expected soon: Estuarine crocodiles, soft-shelled turtles, and mangrove snake. Most important exhibits: Mauritius terrapin, 20 ft. reticulated python, electric eel.

Paignton Seashore Aquarium, Paignton Harbour, Paignton, Devon. Admission charge—Adults, 1s. 6d.; children, 9d. Open every day including Sundays, 10 a.m.-10 p.m. Party terms: Organised parties 6d. per head. Description: Each aquarium tank illustrated by models and information to explain facets of the living creatures. Large number of educational exhibits explaining local seashore life. All specimens are from immediate local waters. Filming studio on premises where television (B.B.C. "Look" series) films are made about marine life.

Teignmouth Aquariums, The Den, Teignmouth, Devon. Admission charge—Adults, 1s.; children, 6d. Open every day including Sundays, 10 a.m.-10 p.m. Party terms: Organised parties 6d. per head. Description: Each aquarium tank contains local seashore life. A large number of educational exhibits explain local marine life with seashell display among others.

Marine Biological Association of the United Kingdom, Citadel Hill, Plymouth, Devon. Admission charge—Adults 1s.; children 6d. Open weekdays 10 a.m.-6 p.m. (May to September to 8 p.m.). Party terms: Reduced rates by prior arrangements by letter to the Director. Description: Local marine fishes and invertebrates displayed exceptionally well in an aquarium of modern design. Seventeen tanks. Largest approx. 30 ft. × 9 ft. × 3½—4½ ft. deep; smallest approx. 1 ft. 8 ins. × 1ft. × 1ft.

EDINBURGH

The Carnegie Aquarium, The Royal Zoological Society of Scotland, Scottish National Zoological Park, Murrayfield, Edinburgh, 12. Admission charge—Adults, 6d.; children, 3d. Open every day of the year. Summer 11 a.m.-8.45 p.m. Winter 11 a.m.-sunset. Party terms: none, except for Edinburgh Corporation Schools. Description: Consists of three large halls. Tank devoted to marine exhibits including green and hawk-billed turtles, conger eels, lobsters and crabs etc., and many sea fish. Freshwater specimens include electric eels, lung fish, giant salamander, giant catfish. Large variety of brilliantly coloured fish, both coldwater and tropical.

ISLE OF MAN

Marine Biological Station (University of Liverpool), Port Erin, Isle of Man. Admission charge—Adults, 1s.; children under 14, 6d. Open Monday to Saturday, 10 a.m.-5 p.m. all year. Party terms: Organised educational parties admitted free if prior notice given. Description: Marine. 6 large and 10 smaller tanks. Good display of local fish and invertebrates. Plaice rearing.

LANCASHIRE

The Tower Aquarium, Tower Main Buildings, Blackpool. Admission charge—Adults, 3s.; children, 1s. 6d. This includes special admission which includes Tower Ballroom, Zoo, Aviaries and Ocean Room Cabaret. Open 9 a.m.-10.30 p.m. Sunday to Saturday. Description: Aquarium founded in 1874. Consists of a central block of twelve large tanks with 36 smaller tanks on the outer walls. The total collection is 349 species of fish and 24 species of invertebrates. Latest addition, Chinese grass carp (*Ctenopharyngodon idella*), Clarias (*Clarias angularis*). Aquarium speciality: British marine fish.

Marineland, Stone Jetty, Morecambe, Lancashire. Admission charge—Adults, 4s.; children, 2s. Open daily from 10 a.m. Party terms: Parties of 20 or more, 3s. and 1s. 6d. Description: Europe's first Oceanarium; also wide selections of marine and freshwater tropicals. Local fish and coldwater fish, seals, sea lions, penguins, alligators, turtles and dolphins. Sea circus daily at 11.15 a.m., 2.15 p.m. and 6.15 p.m. with performing chimps, sea lions and dolphins. Newly arrived: "Clipper," star dolphin performer from New York's World Fair.

Belle Vue Zoo Park Aquarium and Reptilium, Manchester, 12. Admission charge—Adults, 1s.; children, 6d. Open daily 10 a.m.-6.30 p.m. General admission to Park: 3s.; children, 1s. 6d. Party rates (25 or more): Adults, 2s.; children, 1s. 3d. Admission to Aquarium and Reptilium: Adults, 1s.; children, 6d. Description: Three halls of tanks ranging from 25 to 1,500 gallons exhibit familiar favourites of the tropical freshwater world, fishes of the coral seas and specimens from our own coastal waters, rivers and lakes. Continuing through the Reptilium, a wide range of snakes, lizards, terrapins, monsters and the now world-famous breeding alligators may be viewed.

LONDON

The Aquarium of the Zoological Society of London, The London Zoo, Regent's Park, London, N.W.1. Admission charge—Adults, 2s.; children, 1s. Open throughout the year (except Christmas Day) from 10 a.m.-45 minutes before closing time of main Zoo at dusk or 7 p.m., whichever is earlier. From Good Friday to September, last admission to Aquarium is 7.15 p.m., closing time 7.45 p.m. Description: Marine and freshwater: 100 tanks ranging in length from 12 inches to 30 feet. Marine Hall with fish and invertebrates from tropical and temperate waters. Tropical Hall with many primitive freshwater fish and an arapaima over 5 feet long. Temperate Freshwater Hall with representative collection of European and other fish; also aquatic amphibians.

SURREY

Chessington Zoo Ltd., Leatherhead Road, Chessington, Surrey. Admission charge—6s., adults and children. Open week-ends in March. Easter to 31st October, 10.30 a.m.-5.30 p.m. early season, 6.30 p.m. full season. Party terms: 3d. each adult and children for parties of 30 or more. Description: Chessington's Aquarium, although small, has a varied collection of coldwater and tropical fish (500 in 70 species) kept in 26 tanks varying in size 24 by 12 by 18 ins. to 66 by 12 by 24 ins. Amphibians and reptiles are also on display as at the moment there is no separate Reptile House.

SUSSEX

Brighton Aquarium, Marine Parade and Madeira Drive, Brighton, Sussex. Admission charge—Adults, 2s.; children, 1s. Open every day of the year 9 a.m.-dusk; Christmas Day 9 a.m.-1 p.m. Party terms: Adults, 1s.; children, 6d. Description: 12 freshwater tanks, two large capacity, containing carp, orfe and bream; 10 marine tanks, specimens added as available; 12 tropical tanks. Lung fish and piranha are recent arrivals. Other large tanks contain harbour seals and turtle. A sea-lion pool (great attraction to visitors).

WORCESTERSHIRE

The Dudley Zoological Society Ltd. (The Aquarium), 2, The Broadway, Dudley, Worcestershire. No admission charge to Aquarium. Open Monday to Sunday, 10 a.m.-6 p.m. (during summer months); 10 a.m.-4 p.m. (winter months). Party terms: 25-100: Adults or children or mixed: Adults, 3s.; children, 1s. 4d. 101-250: Adults, 3s. 9d.; children, 1s. 2d. 251-500: Adults, 2s. 3d.; children, 1s. 501 and over: Adults, 2s.; children, 9d. Description: Built in the Castle Crypt, the Aquarium contains 59 tropical tanks (one marine) and 18 coldwater. Several amphibians, as well as invertebrates, are also displayed. Heating is achieved by both gas boiler and electric tubular heaters. Interesting specimens include an electric eel, an African bungfish, and a 2½ lb. black "shark."

Book review

'Pond Life in the Aquarium', by Dr. Horst Janus, translated by Gwynne Vevers and published by Studio Vista Limited at 10s. 6d.

ANOTHER in the range of four paperback books by continental authors. Dr. Horst Janus is Senior Curator of the Natural History Museum at Stuttgart, and his book, unlike a couple of others in this series, is written for the beginner who wants to try to keep pond animals and plants in an aquarium. This 64-page book is indexed and well illustrated with 48 good drawings, and a colour photograph on the cover.

The book is divided into 6 sections, the last one dealing with a variety of animal groups and taking up a large portion of the book. Section 1 deals with ponds, pools and other areas of natural standing waters, from which aquatic animals and plants may be collected. The second part of the book concerns the equipment needed on collecting trips for pond life. Section 3 deals with the setting up of aquaria for pond animals and plants.

Collecting different pond creatures and creatures in different stages of development, at different seasons of the year, is considered in Section 4. The following section deals with the planting of the aquarium and suggests suitable plants which may be collected. There are some excellent drawings of such plants. Instructions for establishing the new aquarium are included but these facts would be well known to even the beginner aquarist.

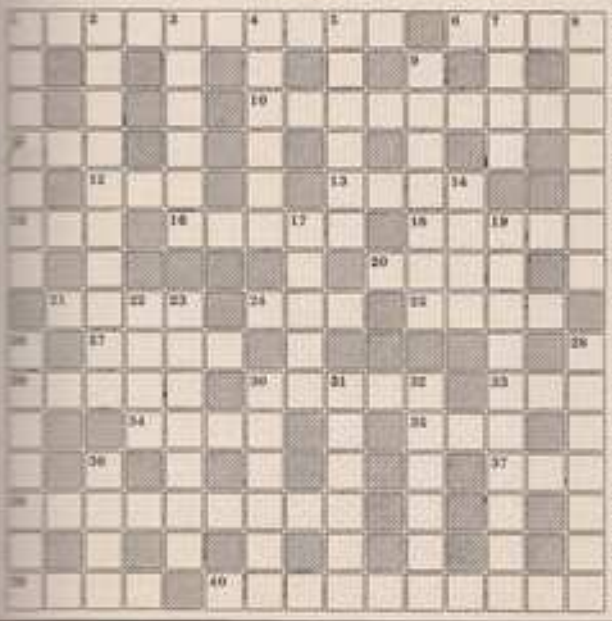
We now come to the last section in the book, which covers 43 pages and deals with animal groups, starting with the simpler forms of animal life and ranging to the more complex.

For further reading, three English books are recommended, but for the beginner in this branch of aquarium keeping, the author has covered all the main points necessary, including the feeding of water creatures and the necessity of keeping some different kinds of animal life in separate containers, because of the likelihood of some animals eating others as food. Although originally written for the continental reader, most of the creatures discussed can be found wild in Britain. Other types of animal life can, as the book suggests, be obtained from specialist stockists.

Of the four paperbacks available in this new series, this is perhaps the one directed mainly at the beginner. As further books in this series are in preparation, it will be interesting to see what other fresh views appear.

The AQUARIST Crossword

Compiled by M. W. SAUNDERS



CLUES ACROSS

1. Might these fish have a sting in their tail? (6, 4).
6. Mostly a spare pole (4).
10. Revelations which may come in a flash? (9).
11. Found in the North Sea it might keep fish warm (5).
12. Sounds like the sheltered side of Surrey? (3).
13. A knot of coral? (4).
15. On which you practically skip the snowy slope (3).
16. Marky all round the study (5).
18. Type of beach which might make some people laugh (5).
20. Nets tangled round the weapon (4).
21. This ghost is mostly a rogue (4).
24. Copy from a perfect original? (3)
25. Cocks, and borders as the sun goes down (4).
27. Slippery customers? (4).
28. Mob (5).
30. Carps mix it round the wreck (5).
33. Not modesty (3).
34. Cats may be seen about this fish (4).
35. That donkey from the grassy meadow (3).
37. Certain to be a winner (3).
38. This tank dweller is sure to be a booming success (4, 5).
39. In a nutshell, in to the egg shell (8).
40. Common name for *Hemigrammus Unilineatus* (7, 3).

CLUES DOWN

1. Definitely the largest egg lots (7).
2. Descriptive of a bottom dweller when stirring? (3, 7).
3. What you did for Lent? (8).
4. Spawns (6).
5. Termination of — that's the end (6).
7. Wine most welcome to a sailor (4).
8. Writes some again and then retires (7).
9. Fundamentals of (7).
14. Run away with the *Daphnia*? (4).
17. Started to pick the subject (5).
19. Ideal location for the goldfish bowl with one fish in? (2, 3, 5)
22. Occupiers of Rhode Island? (4).
23. Chosen by the voters (7).
26. Mainly Geronimo, one imagines (7).
28. Part of the item pot (7).
31. Most tropical fish have at least one (6).
32. Descriptive of 38 across perhaps (3, 5).
33. Most useful when one is up the creek (6).
36. Would bring up the rear of a school of fish (4).

Solution on page 158

News from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

THERE was a record entry of 350 at the **Barry A.S.** second open show held in July. The results were as follows: Class 1: 1, A. Williams; 2, F. Brown; 3, P. Battista. Class 2: 1, B. Light; 2, A. Ibbertson; 3, T. Phipps; 4, D. Sotgiourt. Class 3: 1 and 3, F. Brown; 2, R. Wigg; 4, H. Humphreys. Class 4: 1 and 4, D. Johns; 2, N. Cornell; 3, F. Brown. Class 5: 1, F. Battista; 2, J. Burgwin; 3, A. Williams; 4, B. Clarke. Class 6: 1, C. Gorwill; 2, B. Clarke; 3 and 4, F. Harris. Class 7: 1, D. Johns; 2, J. Sanders; 3, A. Davis; 4, T. Phipps. Class 8: 1, B. Clarke; 2, G. Tippins; 3, J. Barnes; 4, B. Light. Class 9: 1, F. Brown; 2, F. Battista; 3, B. Clarke; 4, A. Ibbertson. Class 10: 1, M. James; 2, J. Burgwin; 3, G. Lewis; 4, B. Light. Class 11: 1, S. Storer; 2, F. Battista 3 and 4, R. Wigg. Class 12: 1, F. Battista; 2 and 4, C. W. Smith; 3, R. Wigg. Class 14: 1, F. Brown; 2, R. Wigg; 3, B. Clarke; 4, J. Burgwin. Class 15: 1, F. Brown; 2, J. Sanders; 3, W. Ward; 4, R. Nelson. Furnished Aquariums: 1, G. Lloyd; 2, T. Phipps; 3, B. Light; 4, R. Nelson. Class 17: B. Light, 1, 2, 3, 4. Class 18: L. G. Emery, 1, 2, 3, 4. Class 19: L. G. Emery, 1, 2, 3, 4. Class 20: B. Light, 1, 2, 3, 4. Mr. L. G. Emery won the Cup for Best Fish in Show.

* * *

THE results of the **Portsmouth A.S.** open show were as follows: Inter-Club Furnished Tropical Aquaria: 1, Regate & Redhill A.S.; 2, Southampton A.S.; 3, Mr. M. Mason. Inter-Club Furnished Aquaria (Coldwater): 1, Reigate & Redhill A.S.; 2, Carnarvon Club; 3, Portsmouth A.S. Individual Furnished Aquaria (Tropical): 1, Mr. G. Bass; 2, Mr. A. Burley. Individual Furnished Aquaria (Coldwater): 1, Mrs. I. Stilwell; 2, Mr. W. Leach; 3, Mrs. P. Whittington. Individual Marine Furnished Aquaria: 1, Mrs. I. Stilwell; 2, Mr. J. Howard. Individual Junior Furnished Aquaria (Tropical): 1, Master T. Smith. Individual Junior Furnished Aquaria (Coldwater): 1, Master T. Leach; 2, Master I. Spragg. Common Goldfish: 1, Mr. W. Leach; 2, Mr. R. Bocken; 3, Mrs. P. Whittington. Bristol Shubunkin: 1, 2 and 3, Mr. R. Whittington. London Shubunkin: 1, Mr. G. Eastwood; 2, Mrs. P. Whittington; 3, Mr. W. Leach. Fantail: 1, Mr. E. Binstead; 2, Mr. I. Stilwell. Moor: 1, Mr. R. Whittington; 2, Mr. H. Hancock. A.O.V. Fancy Goldfish: 1, Mr. W. Leach; 2, Mr. V. Hunt; 3, Mr. F. Ryder. Golden Carp, Rudd, Tench and Orfe: 1, Misses G. & P. Speake; 2, Mr. J. Howard; 3, Mr. H. Hancock. A.O.S. Cyprinidae: 1 and 2, Mr. J. Howard; 3, Mr. D. Hancock. A.O.S. Coldwater: 1, Mr. I. Stilwell; 2, Mr. V. Hunt; 3, Mr. R. Whittington. Novice Coldwater: 1, Mr. E. Binstead; 2, Mr. T. Leach. A.V. Male Guppy: 1, Mr. G. Bass; 2, Mr. & Mrs. C. Bailey; 3, Mr. A. Burley. A.V. Female Guppy: 1 and 3, Mr. G. Bass; 2, Mr. R. Biggs. A.S. Swordtail: 1, Mr. O. Jones; 2, Mr. G. Greenhall; 3, Mr. G. Greenhall. A.S. Platy: 1, Mr. G. Bass; 2, Mr. Scott-Morgan; 3, Mr. R. Wylie. A.S. Molly: 1 and 2, Mr. H. Rundle; 3, Mr. Scott-Morgan. A.O.S. Livebearer: 1, Mr. Scott-Morgan; 2, Mr. V. Wen; 3, Mr. G. Greenhall. Apistogrammas, Pelmatochromis and Nannacara species: 1, Mr. R. Keeping; 2, Mr. P. Collins; 3, Mr. M. Mason. A.O.S. Cichlid: 1, Mr. L. Jordan; 2, Mr. P. Collins; 3, Mr. Scott-Morgan. Barbs: 1, Mr. J. Hopper; 2, Mr. I. Perman; 3, Mr. E. Warren. Rasboras: 1, Mr. R. Biggs; 2 and 3, Mr. G. Greenhall. Hyphessobrycon and Hemigrammus species: 1, Mr. H. Armitage; 2, Mr. M. Mason; 3, Mr. I. Perman. A.O.S. Characins: 1, Master M. Warren; 2, Mr. N. Franklin; 3, Mrs. R. Greenhall. Corydoras Catfish: 1, Mr. H. Armitage; 2 and 3, Mr. N. Franklin. A.O.S. Catfish: 1, Mr. G. Greenhall; 2, Mr. H. Rundle; 3, Mr. & Mrs. C. Bailey. Egglaying Toothcarp: 1, Mr. H. Armitage; 2, Mr. N. Franklin; 3, Mr. H. Armitage. Danio, Carp and Minnow: 1, Mr. D. Collyer; 2, Mr. G. Bass; 3, Master M. Warren. Siamese Fighter: 1, Mr. Stewart; 2, Mr. R. Keeping; 3, Mr. A. Burley. A.O.S. Labyrinth: 1, Mr. G. Greenhall; 2 and 3, Mr. G. Bass. A.O.S. Egglayer: 1, Mr. H. Warren; 2, Mr. H. Armitage; 3, Mr. G. Bass. Novice Tropical: 1, Mrs. M. Armitage; 2, Mr. N. Packman; 3, Mr. M. Warren. Breeders—Coldwater: 1 and 2, Mr. R. Whittington; 3, Mrs. P. Whittington. Breeders—Livebearers: 1, Mr. G. Greenhall; 2, Mr. & Mrs. C. Bailey; 3, Mr. D. Jones. Breeders—Egglayers: 1, Mr. H. Armitage; 2 and 3, Mr. R. Keeping. Breeders—Goggles: 1 and 2, Mr. A. Smith; 3, Mr. D. Jones. Rooted Plant: 1, Mr. M. Mason; 2, Mr. Scott-Morgan; 3, Mr. G. Greenhall. Plant Cuttings: 1, Mr. & Mrs. C. Bailey; 2 and 3, Mr. J. Howard. Floating Plant: 1, Mr. W. Leach; 2, Mr. J. Howard.

* * *

THE second annual open table show of the **Rowntree (York) A.S.** attracted 295 exhibits. Leading results in the society's competition were: Cresswell 55 points, Swillington 37, Huddersfield 35, White Rose, Leeds 30, Staithes 22, Bradford 21, Pontefract 18, Stockton-on-Tees 15, Heywood 14, Tadcaster 14, Sunderland 13. Best Fish in Show: Mr. D. Carr (Bradford) Flying Fox. Other results were as follows: Swordtails: 1, D. Clarke (Garforth); 2, R. E. Hampson (Attleborough); 3, Mrs. B. Cohen (Pontefract). Mollies: 1, W. Payne (Hartlepool); 2, W. Brayne (Stockport); 3, K. Smales (Swillington). Platys: 1, G. Hammett (Huddersfield); 2, J. Chamberlain (Stockton); 3, P. Reynolds (Swillington). Guppies: 1, Mrs. B. Weissenruch (Heywood); 2, J. B. Wake (Huddersfield); 3, H. Heer (Salford). Barbs, small: 1, Mrs. S. Batty (Swillington); 2, A. and F. Staniforth (Cresswell); 3, R. Glover (Swillington). Barbs, large: 1, A. and F. Staniforth; 2, W. Parkin (Huddersfield); 3, J. G. Hunt (Sunderland). Characins, small: 1, Mrs. S. Batty; 2, S. Collings (T.A.B.); 3, G. Sumners (York). Large: 1, A. M. Deakin (Cresswell); 2, Mrs. E. M. Smith (Staithes); 3, J. W. Bower (Mansfield). Minnows, Danios and Rasboras: 1, D. Carr (Bradford); 2, A. and F. Staniforth; 3, C. Holmes (Hatfield). Sharks and flying fox: 1, D. Carr; 2, A. M. Deakin; 3, Mrs. E. M. Smith. Fighting fish: 1, W. Catterall (Tadcaster); 2, A. and F. Staniforth; 3, P. Reynolds (Swillington). Anabantids, A.O.V.: 1, A. Deakin; 2, R. E. Hampson (Attleborough); 3, L. Kaye (Huddersfield). Cichlids, dwarf: 1, J. Heslop (Peterlee); 2, L. Kaye; 3, J. Flintoff (Staithes). Large: 1, C. Holmes; 2, J. G. Hunt (Sunderland); 3, W. Parkin. Catfish, small: 1, A. Tromer (Staithes); 2, Mr. and Mrs. B. Wiggins (White Rose); 3, K. Smales (Swillington). Large: 1, Mrs. B. Wiggins (White Rose); 2, Mr. and Mrs. B. Wiggins; 3, J. C. S. Williams (Otley). Loach and eels: 1, J. G. Hunt; 2 and 3, W. Parkin. Toothcarps: 1, W. Catterall (Tadcaster); 2, P. Reynolds; 3, K. Smales. Breeders, Live-bearers: 1 and 2, J. Williamson (Stockton-on-Tees); 3, P. Clarke (Garforth). Breeders, Egg-layers: 1, A. Ashley (Cresswell); 2, D. Cohen (Pontefract); 3, G. Hammett (Huddersfield). Pairs, Livebearers: 1, B. Weissenruch (Heywood); 2, D. Cohen; 3, B. Wiggins. Egg-layers: 1, D. Carr (Bradford); 2, W. Parkin; 3, R. Bean (Snaith). Tropical A.O.V.: 1, R. Bean (Snaith); 2, J. Henley (Cresswell). Ladies' Tropical A.V.: 1, Miss A. Wiggins; 2, Mrs. B. Cohen; 3, Mrs. A. Dearing (York Juniors). Tropical A.V.: 1, Miss L. Henley (Cresswell); 2, Miss L. Hampson (Alvthorough); 3, Miss A. Wiggins. Coldwater, A.V.: 1, A. Tromer; 2, P. Wales (White Rose); 3, F. B. Hill (Thorne). Individual Furnished Aquaria: 2, P. Reynolds; 3, Mrs. B. Cohen.

* * *

THE quarterly meeting of the **Association of Yorkshire Aquarist Societies:** delegates from the Bradford, Dewsbury, Halton, Hull, Maxendon, Rowntree (York), Sheffield, Skipton, Swillington, Wakefield and York Societies were welcomed by the Chairman, Mr. D. Carr, (Bradford). A special greeting was extended to the delegates from the York and District Aquarist Society who have re-joined the Association. The Hon. Secretary informed the meeting that only six Societies within the Yorkshire boundaries remained outside the fellowship of the A.Y.A.S., he had sent letters of invitation to join the Association to the Hon. Secretaries of these Societies; he hoped to receive favourable replies.

A.Y.A.S. Trophies. The Bradford Societies suggestion that the standard trophy be an oblong pointed wooden plaque (9½ x 4½) with a suitably inscribed chrome centre-piece was accepted. A.Y.A.S. Open Show, 1967. This will be held in Hull and sponsored by the Hull Aquarist Society, subject to confirmation it will be held on the first Sunday in May. Mr. Winterburn (Bradford) suggested that at Society Shows the class awards be announced or written-up in some way as and when the results became available from the judges, with prompt publication of class winners would be greatly appreciated by all exhibitors. Standard Society Show Rules. It was put to the meeting that the Association formulate a set of rules that all member Societies would accept, operate and adhere to as individual Society Shows. After lively discussion it was agreed that show rules must remain the responsibility of each Society. It was unanimously agreed that the show rules of any Society as published in its schedule should be clear and concise, also that each rule, without exception, be strictly applied and adhered to, absolute observance of the rules by both organizers and exhibitors would eradicate the possibility of "incidents" such as had been quoted by some delegates. The next Quarterly Meeting of the A.Y.A.S. will be held on Saturday, 19th November at 3 p.m. in the Church Institute, Albion Place, Leeds.

* * *

BOTH the July and August Meetings of the **Dundee A.S.** were attended by twenty four members and the results of the Table shows were as follows:— Barbs 'A': 1 and 2, S. Gould; 3, F. McNaughton; 4, A. Robb. Barbs 'B': 1, S. Gould; 2, A. Hastie; 3, G. Kirkcaldy; 4, F. McNaughton. Loaches: 1, G. Kirkcaldy; 2, R. Hill. Junior Trophy—Barbs 'A': 1 and 2, S. Gould; 3, G. Kirkcaldy. Barbs 'B': 1, S. Gould; 2 and 3, G. Kirkcaldy; 4, S. Gould. Loaches: 1, G. Kirkcaldy. The programme at this meeting was a talk by Fergus McNaughton on the construction of simple carrying boxes. August Meeting: Scott Trophy and Junior Trophy—Exotic and Native Coldwater. Exotic Coldwater: 1, D. Petrie; 2, S. Gould. Native Coldwater: 1, S. Gould.

* * *

THE first open show of the **Maxenden Tropical Fish Society** attracted 212 entries and the results were as follows: Guppies: 1 and 2, B. Weissenruch (Heywood); 3, Mr. Holden (Clitheroe). Swordtails: 1, F. Brown (Maxendon); 2, K. Smales (Swillington); 3, P. Clarke (Garforth). Platies: 1, Mr. Rich (Stockport); 2, Stella Smith (Blackpool); 3, Mrs. Jones (Abbeybrough). Mollies: 1, G. Howard (Blackpool); 2, L. McCourt (Gorton & Openshaw); 3, G. Mather (Stockport). Barbs: 1, J. Smith (Blackpool); 2 and 3, F. Gregory (Oxton). Characins (Small): 1, F. Gregory (Oxton); 2, M. Mathews

Lythan; 3, S. Collings (T.A.B.). Characins (Medium): 1, E. Price (Gorton & Openshaw); 2, Mr. Cross (Blackpool); 3, B. Winters (Miramar). Characins (Large): 1, R. Williamson (Surrey); 2, F. Mells (Merseyside); 3, P. Reynolds (Swillington). Cichlids (Dwarf): 1, J. S. Wilks (Huddersfield); 2, E. Price (Gorton & Openshaw); 3, L. McCourt (Gorton & Openshaw). Cichlids A.O.V.: 1, F. Mells (Merseyside); 2, Mr. Rose (Huddersfield); 3, L. Kaye (Huddersfield). Toothcarps: 1, J. Smith (Blackpool); 2, K. Smales (Swillington); 3, Mr. Hallett (Clitheroe). Fighters: 1, A. Beasley (Heywood); 2, Mr. Hallett (Clitheroe); 3, P. Reynolds (Swillington). Anabantids A.O.V.: 1 and 2, J. Smith (Blackpool); 3, Mr. Moorcroft (Merseyside). Sharks and Flying Foxes: 1, Mr. Rose (Miramar); 2, P. Reynolds (Swillington); 3, Mr. Moorcroft (Merseyside). Danios, Minnows, Rasboras: 1, P. Gregory (Oxton); 2, A. Beasley (Heywood); 3, Mr. Moorcroft (Merseyside). Catfish and Loaches: 1, W. Booth (T.A.B.); 2, E. Price (Gorton & Openshaw); 3, K. Smales (Swillington). Breeders Egglayers: 1, J. Smith (Blackpool). Breeders Livebearers: 1 and 2, R. Wilkinson (Halifax); 3, L. Kaye (Huddersfield). Pairs Egglayers: 1, B. Parkin (T.A.B.); 2, E. Price (Gorton & Openshaw); 3, F. Mells (Merseyside). Pairs Livebearers: 1, A. Caterham (Swillington); 2, K. Glover (Swillington); 3, A. Beasley (Heywood). A.O.V. Livebearers: 1, D. P. Johnson (Stockport); 2, R. Wainwright (Heywood); 3, R. Joyce (Sutherland). Junior Tropical and Coldwater: Master D. Hallett (Clitheroe); 2 and 3, Miss E. Johnson (Stockport). A.O.V. Coldwater: 1 and 2, L. Booth (Bradford); 3, Mr. Rose (Huddersfield). Best Fish in Show: Mr. J. Smith (Blackpool) also awarded A.Y.A.S. "Premier Award" Diploma.

Any Fish Keeper in the Halifax district interested in joining this Society should call in at the Mitchelson Community Centre on a Thursday evening or write or call on the Hon. Secretary. A warm welcome is assured.

* * *

THE **North of Scotland Aquarist Society** held their first meeting of the 1966-67 winter season on the 8th September in the lecture hall of Aberdeen's new zoo. The members were very pleased to welcome Mr. George Leslie (Honorary President) who has recently recovered from a severe illness.

After a general discussion was held to decide on the future policy of the club the members adjourned to the Aquaria section of the zoo to carry out any work which was found to be necessary on the tanks which were donated and opened by the N. of S.A.S. At present there is a diverse variety of fishes but the North of Scotland Zoological Society have offered to provide funds for the purchase of much rarer specimens.

Anyone interested in this recently re-formed club will be made welcome at any of the meetings which are held in the lecture Hall of Aberdeen Zoo on the first Tuesday every month or contact the Secretary, Mr. D. Leslie, 58, Bonnymuir Place, Aberdeen.

* * *

THE guest speaker at the September meeting of the **Newport A.S.** was Mr. R. Dennis Johns, secretary of the South Wales Tropical Fish Study Group. His subject, enthusiastically received by a large audience, was "The problems of Establishing Tropical Fish" and was particularly relevant due to the Society staging its fourth Annual Open Show a fortnight later. The results of a table show for Guppies judged by master members Mr. P. Glyn James and Mr. Michael Parry were 1 and 2, Mr. Les Bannerman; 3, Master Clive Pemberton.

The previous month several members of the Society, together with members of the neighbouring societies of Barry and Cardiff had participated in a coach journey to Birmingham in order to attend the last day of the 23rd Annual Open Show of the Midland Aquarium and Pool Society held at the Bingley Hall. Although, due to travelling, time at the show was limited, an enjoyable day was had by all.

Local enthusiasts are reminded that meetings of the society are held on the first Tuesday of each month at the R.A.O.B. Club, Havelock Street, Stow Hill, Newport. Further details are available from the secretary, Mrs. E. A. Salmon, S.R.N., 33 Clarence Park Avenue, Newport, Mon. (Telephone 73588).

* * *

AT the August meeting of the **Ilford & District Aquarist' & Pondkeepers' Society,** the main event of the evening's programme was the presentation by Mr. H. Berger, Show Secretary, of slides and tape recordings in connection with the Society's annual Pond Competition. Some very good coloured film was shown illustrating a wide selection of ponds and water gardens with comments indicating how an informal or formal pool can be constructed and what the judges look for when awarding points in the competition. The results of the 1966 Pond Competition were announced and comments on the various entries were given by one of the judges, Mr. Michael Bell. The winners of the competition were as follows: 1, Mr. Cook; 2, Mr. Dixon; 3, Mr. Neer; 4, Mr. Hartley.

The August Table Show was for Cold Water Plants, Tropical Plants and Cichlids, and the results were: Coldwater Plants: 1, 2 and 3, Mr. Dixon; 4, Mr. Berger. Tropical Plants: 1, Mr. Bell; 2, Mr. Dixon; 3 and 4, Mr. Hartson. Cichlids: 1, Mr. Roth; 2 and 3, Mr. Hartson; 4, Mr. Robinson. The next meeting of the Society will be on Monday the 10th October when it is hoped to arrange a sale of fish, plants and accessories to members and also a lecture. Anyone interested will be most welcome to attend. Further information available from the Secretary, Mr. R. Roth, 15 Dunkeld Road, Dagenham.

* * *

THE **Oxton Aquarist's Society** held their seventh Annual Open Show on the 27th and 28th August, and there was a large attendance of the public on both days to view over 500 exhibits of Tropical and Coldwater Fish and Furnished Aquaria. The hall was tastefully decorated with exotic plants by Mr. J. Pinhall of Shaw, the well-known horticulturist. The exhibits were judged by Messrs. C. Walker, F.N.A.S. of Oldham and A. Lindley, F.N.A.S. of Nottingham. Results:— Furnished Aquaria: 1, W. Page (Oxton); 2 and 3, H. Pinhall (Oxton). Anabantids: 1, K. Hill (Heywood); 2, L. Marshall (Oldham); 3, G. Kershaw (Heywood). Fighters: 1, A. Beasley (Heywood); 2, J. Williams (Oxton); 3, T. E. Davies (Heywood). Small Barbs: 1 and 2, F. Gregory (Oxton); 3, B. Preston (Heywood). Large Barbs: 1, Mrs. P. A. Nicholls (Oxton); 2, R. Bottomley (Oxton); 3, F. Dalzell (Oxton). Labeos and Sharks: 1, K. Ashworth (Oxton); 2, R. Bottomley (Oxton). Small Characins: 1, H. Rennie (Oldham); 2 and 3, A. E. Mackey (Oxton). Medium Characins: 1, E. Price (Gorton); 2, R. Collins (Oxton); 3, J. E. Shore (Oxton). Large Characins: 1, Mrs. P. A. Nicholls (Oxton); 2, W. Taylor (Oxton); 3, H. W. Hughes (T.A.B.). Rasboras: 1, A. E. Mackey (Oxton); 2 and 3, P. Gregory (Oxton). Danios: 1, L. Marshall (Oldham); 2, A. Beasley (Heywood); 3, F. Gregory (Oxton). Dwarf Cichlids: 1, E. Price (Gorton); 2, A. Maltby (Oxton); 3, F. Gregory (Oxton). Angels: 1, J. Wood (Heywood); 2, H. Stockton (Oldham); 3, K. Ashworth (Oxton). A.O.V. Cichlid: 1, Miss B. Johnson (Stockport); 2, A. Maltby (Oxton); 3, A. B. Wilkie (Stretford). Tooth Carps: 1, K. Williamson (Oxton); 2, A. Beasley (Heywood); 3, F. Partington (Oxton). Goldfish: 1, H. Pinhall (Oxton); 2, L. Baxter (N.G.P.S.); 3, J. Pogson (Oxton). Shubunkins: 1 and 2, W. H. Smith (Stretford); 3, L. Baxter (N.G.P.S.). Veiltails: 1, L. Marshall (Oldham). Orandas & Lionheads: 1 and 2, H. Pinhall (Oxton); 3, K. Birch (Heywood). A.O.V. Goldwater: 1, 2 and 3, H. Pinhall (Oxton). Loach: 1, W. Taylor (Oxton); 2, R. Bottomley (Oxton); 3, K. Hill (Heywood). Catfish: 1, H. W. Hughes (T.A.B.); 2, K. Williams (Oxton); 3, W. Booth (Ashton). Scarcehalts: 1, J. Williams (Oxton); 2, R. Birch (Heywood); 3, A. B. Wilkie (Stretford). Mollies: 1, L. McCourt (Gorton); 2, A. Beasley (Heywood); 3, E. Preston (Heywood). Platies: 1, A. Beasley (Heywood); 2, Miss B. Johnson (Stockport); 3, A. E. Mackey (Oxton). Guppies: 1, H. W. Hughes (T.A.B.); 2 and 3, B. Wolstencroft (Heywood). Breeders Eggtayers: 1, A. E. Mackey (Oxton); 2, K. Williamson (Oxton); 3, J. E. Shore (Oxton). Breeders Livebearers: 1, H. Page (Oxton); 2, F. Dalzell (Oxton); 3, A. B. Wilkie (Stretford). Breeders Guppies: 1, T. Sutton (Oxton). A.O.V. Tropical: 1, W. Taylor (Oxton); 2, D. P. Johnson (Stockport); 3, L. McCourt (Gorton). Pairs Eggtayers: 1, E. Price (Gorton); 2, H. W. Hughes (T.A.B.); 3, K. Hill (Heywood). Pairs Livebearers: 1 and 2, A. Beasley (Heywood); 3, A. E. Mackey (Oxton). Junior Members: 1, Miss L. D. Shore (Oxton); 2, T. Sutton (Oxton); 3, Miss L. Taylor (Oxton).

The Award for exhibiting the Best Fish in the Show went to Mrs. F. A. Nicholls who also won the award for the Best Oxton Exhibit with her entry a *Lepreinus fasciatus*. The best Coldwater exhibit award went to Mr. W. H. Smith of Stretford with his entry a *Bristol Shubunkin*. The Best Breeders team award went to Mr. A. E. Mackey for his entry of a team of *Nannostomus Trifasciatus*. The above were also awarded Diplomas by courtesy of The Federation of Northern Aquarium Societies. The Oxton Achievement Trophy and the Home Furnished Aquaria Trophy were awarded to Mr. P. Gregory. At the presentation the Oxton A.S. President, Mr. J. E. Shore, paid tribute to the work done by Oxton members in promoting this show year after year and to the members wives who gave their time so unstintingly in catering for the visitors to the Show. The Presentation of the prizes was made by the Oxton Chairman, Mr. R. Collins in the absence of Mr. F. F. Ria, the Oxton Divisional Manager who unfortunately was unable to attend.

* * *

THERE were 369 entries from 24 societies for the second annual Open Show of the **Gorton and Openshaw A.S.** The results were as follows:— Guppies: 1, J. Murray (Belle Vue); 2, J. Bray (Salford); 3, R. Wolstencroft (Heywood). Mollies: 1, Mr. M. Wilde (Stretford); 2, R. Hughes (Belle Vue); 3, L. McCourt (Gorton). Platies: 1, G. Rich (Stockport); 2, S. Smith (Blackpool); 3, G. Hodgkinson (Gorton). Swords: 1, R. Moscrroft (Marsey); 2, R. Greenwood (Gorton); 3, Mrs. M. Wilde (Stretford). Livebearer Pairs: 1, E. Mackey (Oxton); 2, Mr. M. Wilde (Stretford); 3, T. Beasley (Heywood). Fighters: 1, M. Fletcher (Glossop); 2, T. Hallet (Clitheroe); 3, T. Beasley (Heywood). A.O.V. Anabantid: 1, J. Smith (Blackpool); 2, C. Jones (Blackpool); 3, A. Wilkie (Stretford). Anabantid Pairs: 1, J. Smith (Blackpool); 2, A. Gardner (Heywood); 3, R. Price (Gorton). Small Barbs: 1, J. Smith (Blackpool); 2, P. Gregory (Oxton); 3, D. Thomella (Aireboro). Large Barbs: 1, K. Parkes (Mersey); 2, R. Thorakinson (Glossop); 3, L. McCourt (Gorton). Labeos: 1, E. Hughes (Belle Vue); 2, A. Gardner (Heywood); 3, F. Nowell (Glossop). Barb Pairs: 1, P. Gregory (Oxton); 2, W. Parkin (T.A.B.); 3, J. Turner (T.A.B.). Dwarf Cichlids: 1, C. Jones (Blackpool); 2, E. Price (Gorton); 3, A. Maltby (Oxton). Large Cichlids: 1, K. Parkes (Mersey); 2, J. Logan (Gorton); 3, A. Wilkie (Stretford). Angels: 1, E. Jackson (Belle Vue); 2, G. Hodgkinson (Gorton); 3, E. Allan (Gorton). Cichlid Pairs: 1, C. Jones (Blackpool); 2, E. Price (Gorton); 3, G. Rich (Stockport). Small Characins: 1, P. Gregory (Oxton); 2, A. Seabright (Belle Vue); 3, J. Robinson (Mersey). Medium Characins: 1, D. Croot (Glossop); 2, K. Parkes (Mersey); 3, R. Collings (T.A.B.). Large Characins: 1, R. Wilkinson (Halifax); 2, W. Taylor (Oxton); 3, A. Wilkie (Stretford). Characin Pairs: 1, W. Parkin (T.A.B.); 2 and 3, D. Thomella (Aireboro). Killifish: 1, R. Williamson (Oxton); 2, J. Smith (Blackpool); 3, T. Hallet (Clitheroe). Rasboras: 1, J. Boardman (Leigh); 2, D. Thomella (Aireboro); 3, J. Robinson (Mersey). Danios: 1 and 2, T. Beasley (Heywood); 3, G. Rich (Stockport). Killie-Danio Pairs: 1, J. Robinson (Mersey); 2, P. Gregory (Oxton); 3, R. Moscroft (Mersey). Corydoras Cats: 1, E. Price (Gorton); 2, L. McCourt (Gorton); 3, P. Moorhouse (Bradford). A.O.V. Cats: 1, W. Booth (Ashton); 2, L. McCourt (Gorton); 3, G. Hodgkinson (Gorton). Loaches: 1, K. Parkes (Mersey); 2, W. Taylor (Oxton); 3, Mrs. Gutmalow (Gorton). Catfish Pairs: 1, W. Parkin (T.A.B.); 2, K. Parkes (Mersey); 3, E. Price (Gorton). Marine: 1, A. Birchall (Oxton). A.V. Coldwater: 1, J. Butterworth (Valley); 2, J. Greenwood (Stretford); 3, J. Hillery (Gorton).

Breeders' Egglayers: 1 and 3, K. Wilbraham (Ormiston); 2, J. Turner (T.A.S.). Livebearer Breeders: 1, C. Jones (Blackpool); 2, H. Page (Ormiston); 3, R. Wilkinson (Halifax). Junior Eggtayers: 1, J. Sutton (Ormiston); 2, Miss Johnson (Stockport); 3, P. Carrol (Huddersfield). Junior Egglayers: 1, M. Wilkinson (Clitheroe); 2, P. Redmond (Gorton); 3, P. Hodgkinson (Gorton).

Best Fish in Show was won by Ken Parker of Merseyside A.S. with a *Lemon Fin Barb* and the Best Breeders in Show went to Keith Wilbraham of Ormiston A.S. with a team of *Empetor tetras*.

* * *

THE **Aireborough and District A.S.** would like to exchange Bulletins with other Societies. The secretary is Mr. R. E. Hampson, The Meadlands, Scotland Lane, Horsforth, nr. Leeds. The recent table show result was as follows:— Anabantids: 1, Mrs. Helm; 2, Mr. Hampson; 3, Mr. Lancaster. A.O.V.: 1 and 3, Mr. Hampson; 2, Mrs. Helm. A.O.V. Novice: 1 and 3, Mr. Whitney; 2, Mr. Iveson. A.O.V. Junior: 1 and 3, Miss Hampson; 2, Mr. Kirby. Best in Show Cup: Mr. Hampson.

* * *

THE leading positions in the **Moray Aquarist Society** table show trophy are: J. G. Main, 35 pts., R. Stewart, 32 pts., V. W. Rawlings, 31 pts., G. Sivey, 30 pts., K. Anderson, 28 pts., T. Burke, 24 pts., A. Thompson, 15 pts. The club's first secretary, Mr. T. Burke, has left the district and the new secretary is Mr. J. W. Rawlings, 4 Gordon Street, Hopeman, Moray.

* * *

AT a recent meeting of the **Tropical Aquarium Breeders** it was proposed that Mr. Jim Kelly be offered the position of President, which office he has accepted. The Committee would like to express their appreciation of his agreement, and feel that his wide knowledge and interesting lectures will be a great asset to the members of the society. The resignation of Mr. Clifford Walker who has been the Chairman since the formation of the society was accepted with much regret from the members, who expressed their appreciation of his wholehearted services in the past. He will remain an active member. The new Chairman elected is Mr. Brian Pawley.

* * *

THE August meeting of the **Valley Aquarist Society** took the form of a discussion on plants. A few of the more well informed members brought a good variety of plants to illustrate what they had to say about them, and the lesser experienced members must have gained quite an amount of useful information. The table show results were as follows: Barbs: 1, Mr. W. Armstrong; 2, Mr. H. Wilson; 3, Mr. R. Bunker. A.O.V. Pairs: 1, Mr. R. Bowker; 2, Mr. F. Taylor; 3, Mr. H. Wilson.

* * *

THE **Fancy Guppy Association** Edmonton section Open show which was held on 3rd September at Edmonton Town Hall again proved the growing interest there is in the specialisation of Guppies. Standards were high and the interest shown was most gratifying.

* * *

AT the last **Leicester Aquarist Society** meeting held on the 1st September, 35 members of the Society benefited from an instructive demonstration lecture given by Mr. Fretwell upon the subject of "Furnished Aquaria for Show purposes". After the lecture and questions, names were taken for the Leicester A.S. Stand at the Abbey Park Show. During the evening fifteen entries were received for the Home Aquaria competition to be held late October.

* * *

THE **F.G.A. (Manchester Section)** held their monthly meeting as usual on the first Sunday in the month at the Longsight Hotel, Belle Vue, Manchester. The August meeting was rather different from usual as instead of the usual guppy talk, the members were given a film show in sound and colour on Marine Fish, Corals and sea Invertebrates. This was both interesting and colourful and most entertaining. It was given by the Association's P.R.O., Mr. Victor Partington.

* * *

THE **Hendon and District A.S.** has now fixed the date of the 1966 Convention for the 12th November, at the usual venue, Whitefields Secondary School, N. W.2, when the guest speaker will be Dr. D. Buckhana, curator of the Exotarium, Hamburg Zoo.

* * *

AT the August general meeting of the **Nottingham and District A.S.** the members were entertained with a show of film slides called "Everyman an Expert" produced by the Hendon Aquatic Society. The winners of the recent Pond competition were awarded prizes by the President, Mr. Lemon, but due to unforseen circumstances the Home Aquaria competition had to be deferred to a later date and will therefore be reported later. The members of the Breeders' section arranged a display of Tropical fish at the Southwell Show on the 20th August.

* * *

THE **Gosport and District A.S.** devoted one of its August meetings to judging a competition of designs for a society emblem. The competition was open to all juniors in the district, and although response from outside the club was non-existent the young members displayed 33 designs. The winner, Master I. Perman was duly awarded the one guinea prize, and the society is now in the process of acquiring quotations for a lapel badge replica. Mr. A. V. Taylor, one of the founder members, who unfortunately now lives in Yorkshire, paid a short visit and kindly consented to judge the monthly table show, results of which were as follows:— Barbs: 1, Master Perman (Striped); 2, Mr. Stevens (Ruby). Cichlids: 1, Master Perman (Angel); 2, Master Perman (Angel).

* * *

AT the August meeting of the **Wakefield A.S.** held at the Magnet Hotel the winners of the table shows were as follows:— Breeders (Newman Trophy): Mr. Archer, and A.O.V.: Mr. Grace. The members present then split into two teams and Mr. Archer acted as question master for a "Fishkeeping Quiz."

* * *

AT the September meeting the **Swindon and District New Aquarist Society** held their third club match. The results were as follows:— Swordtails: 1, J. Gilbert; 2 and 4, D. Cook; 3, R. Gardner. Danios and Panchax: 1, J. Gilbert; 2 and 4, R. Gardner; 3, A. Brewer. Male Siamese Fighters: 1 and 3, D. Cook; 2, J. Gilbert. Sharks: 1 and 3, J. Gilbert; 2, J. Phillips; 4, R. Gardner. Best Fish of the show was awarded to Mr. J. Gilbert (*Panchax Lineatus*).

* * *

SECRETARY CHANGES

Moray Aquarist Society: Mr. J. W. Rawlings, 4 Gordon Street, Hopeman, Moray. Urmston and District Aquarium Society: Mrs. C. Gordon, "The Rowans", 17 Gloucester Road, Urmston, Manchester.

* * *

OBITUARY

IT was with deep regret that **Salford Aquarist Society** learned of the death of their Chairman, Mr. B. Reuben. With his passing the Society has lost a member and friend of great value. Mr. Reuben has been a loyal member for the past 14 years, and will be greatly missed by all his Aquarist friends.

* * *

AQUARISTS' CALENDAR

15th October: East London Aquarists' and Pondkeepers' Association Annual Show, Ripple Road School, Barking, Essex. Schedules from Mrs. P. Hartis, Show Secretary, 66, Leigh Road, East Ham, London, E.6.

16th October: Stone A.S. Second Open Show, Walton Community Centre, Stone, Staffs. Schedules from Mr. K. J. Harvey, 61, St. Vincent Road, Stone, Staffs.

29th-30th October: British Aquarists' Festival, Belle Vue Gardens, Manchester. Full details available later.

12th November: Hendon and District A.S. Annual Convention at Whitefields Secondary School, London, N. W.2. Guest Speaker, Dr. D. Buckhana, curator of the Exotarium, Hamburg Zoo.

Crossword Solution

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

COME SOUTH— FOR A FINE DISPLAY OF TROPICALS— FOR A COMPREHENSIVE GARDEN POOL SERVICE—

WINGATE

Catalogues Available *Telephone* 2406 7, MARKET STREET, WINCHESTER

SOME PEOPLE TRY THEM ALL

–MOST COME BACK TO THE WINNER

The reason, of course, is TetraMin's premium quality. Other flake foods may look, smell and even feel like TetraMin. But none combine TetraMin's extra high protein content and *natural fish foods* that tropicals thrive on.

It's made by TetraKraftWerke, West Germany, world's largest and most experienced fish food manufacturer. Among experts that's the name for premium quality. You can rely on it for scientifically balanced feeding—the finest diet for your fish. TetraMin: It never clouds water. In 10 varieties and many sizes for every feeding need.

FREE FULL-COLOUR FEEDING BROCHURE
Send a stamped addressed envelope for the newly available full colour tropical fish feeding guide complete with feeding and temperature tables to:
Herb-Royal Ltd., Dept A10,
Colley Lane Estate, Bridgwater, Somerset.

Herb Royal

NATURALLY
the BEST!

HERB-ROYAL LIMITED, Colley Lane Estate, BRIDGWATER, Somerset. Tel: BRIDGWATER 5221

The *welcome* freeze has arrived!

NEW

MIRACLE FREEZE–DRIED TUBIFEX

All the advantages of a **natural** high protein food with none of the problems previously associated with Tubifex worms.

This new food, recently introduced in the U.S.A., has caused a sensation—we confidently predict it will do the same here.

Simply press a small piece to the inside front glass of your aquarium and watch your fish enjoy the meal of a lifetime.

- So economical—5 grams costs only 5/6 and feeds an average aquarium of fish for 3 weeks.
- So clean—absolutely sterile. Can be kept until needed, with no fear of deterioration.
- An excellent "holiday" food—no more overfeeding by the uninitiated.
- Can be used to bring your fish to any desired position for display or photography. In time fishes can be hand-fed!
- Even fry will congregate and nibble off small pieces.
- Even when dislodged by voracious appetites it floats until eaten.

Get your Miracle Freeze Dried Tubifex from your local dealer soon and give your fish a treat and yourself a display such as you've never seen before. Your dealer will be pleased to demonstrate this sensational new food.

Miracle Freeze-Dried Tubifex is a T.F.H. Introduction—Naturally.

T.F.H. Publications (London) Ltd., 13 Nutley Lane, Reigate, Surrey—(Reigate 47305).

Hykro from Denmark

Since 1936 Hykro have turned out the finest quality Fish Foods: The latest is the new **Variety** Food. One trial will convince you that it is absolutely unbeatable. We ourselves carry stocks of up to 10,000 Tropicals **(Trade only)** and Thousands of Goldfish: Anyone who has seen our stocks, can tell you they are always in superb condition, and they are fed solely on Hykro Flakes, Concentrated Food, and now of course the new **Variety** Food.

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

Hykro Flakes 1/-. Breeders Pack 1 Kilo **32/6.** Established in 1936.
Hykro Natura 8d.
Hykro Concentrated Food 1/-. Also in ½lb. Pack **2/-.** Fine for all Coldwater Fish and the larger Tropicals.
Hykro Turtle Food 1/3. Larger new Pack.
Hykro Tropical Dried Flies. For Turtles and all Fish **9d.**
And now the Sensational **Variety** Food **3/-.**

JOE GRASSBY

The Hykro Depot, Mobberley, Nr. Knutsford, Cheshire

ROPHELL (HORTICULTURE)
FAIRHAVEN, CALDECOTE, CAMBS.

Telephone: **Madingley 330**

HEATERS

Ex Ex Standard—25, 50, 75, 100w. ... 7-6
Ex Ex Superb—25, 50, 75, 100w. ... 10-0
Delphin 150w. for outdoor use ... 14-6

HEATER HOLDERS

Spring clip type ... 1-10

THERMOSTATS

Ex Ex 'Minor' ... 13-6
Ex Ex 'Major' ... 15-0
Ex Ex 'Sentinel' ... 26-6

THERMOMETERS

Ex Ex Dumpy ... 4-6
Heating Spirit ... 2-6
Standing Spirit ... 3-0
Suction Spirit ... 3-0
Spare Dumpy Rings ... 6

AIR PUMPS

Jeco Mini ... 1-1-0
Jeco Silent ... 1-19-6
Maxitrose Minor ... 1-1-0
Maxitrose Major ... 1-4-0
Zoobeko Super ... 2-14-0

PISTON PUMPS

Hydro 'Jnr' ... 5-7-6
Hydro 'A' ... 6-10-0
Hydro 'B' ... 8-5-0
Hydro 'C' ... 12-10-0

AIR PUMP

Accessories

Tubing clamps ... 1-3
Clear plastic tubing, per ft. ... 3
Red rubber tubing, per ft. ... 4½
Diffuser stone 10" ... 3
" 12" ... 4
" 15" ... 5
Cylindrical diffuser stones ... 1-4
Hydro gang valve ... 3-3
Hydro regulator ... 4-0
Airline valve ... 2-3

AIR PUMP

Spares

Jeco Mini diaphragms ... 1-6
Jeco Silent diaphragms ... 1-6
Maxitrose Minor diaphragms 1-6
Maxitrose Major diaphragms 1-6
Zoobeko Super diaphragms 2-9

RUBBER SUCKERS

Knob Type ... 3
Double sided ... 6

FILTERS

Hydro Jnr. ... 2-0
Hydro De Luxe ... 13-6
Gro Well Bubble Up ... 35-0
Slim Jim, external ... 17-6

FILTRATION

Accessories

Detain glass wool ... 1-3
Detain glass silk ... 1-3
Detain filter carbon ... 1-3

CLEANING EQUIPMENT

Windmill Air Rejector ... 10-0
Windmill Hand Rejector ... 15-9
Aqua Vac Standard (Battery) ... 46-9
Spare bags (5) ... 4-0
Fish Tail siphon ... 2-0
Automatic Fish Tail siphon ... 6-6
Rubber Tubing for siphoning, per ft. ... 6
Aluminium algae scrapers ... 2-3
Seastongs ... 6-6

NETS

Oblong Aquarium Nets. Green Nylon

Mesh

2" × 3" 1-3 3" × 4" 1-6
3" × 6" 2-3 7" × 9" 4-6

White Dacron

3" × 3" 2-3 3" × 6" 3-9
3" diameter Green Nylon 1-0
Daphnia Nets, 12" dia. ... 16-0

Breeders Nets. Nylon cord netting and varnished wooden handles.

4" × 5" Handles 5" ... 13-0
7" × 8" Handles 5" ... 21-6
7" × 8" Handles 18" ... 24-6

BREEDING TRAPS

Grownell 5-way convertible 28-6
Hydro Fish Breeder. Fine and Coarse ... 7-0

MISCELLANEOUS

Arbolite Aquarium Putty, 1 lb. tins. Green or Cream 3-0
Aquarium sealer (Black) ... 1-10
Crystal lacquer (Green) ... 3-0

TANK BACKINGS

Aquarama, 16" × 9½" ... 16-6
Rocks and Caves, 16" × 9½" 15-0
Shipwreck, 16" × 9½" ... 16-6

FEEDING EQUIPMENT

Floating Dry Feeders ... 1-0
Worms Alive automatic feeder ... 9-0

COLORMETER P8

Ph Testing Kit ... 37-6

DUROGNOST

Water hardness testing kit 17-6
Spare tablets (to 10s)
Strength No. 1 ... 3-0

FISH FOODS

Wardleys

Guppy fare ... 1-3 & 2-3
Salmon Eggs ... 1-3 & 2-3
Liver Meal ... 1-3 & 2-3
Beef Meal ... 1-3 & 2-3
Fish Meal ... 1-3 & 2-3
Crab Meal ... 1-3 & 2-3
Molly fare ... 2-6

Other Types

Dried Daphnia ... 6 & 1-6
Ants Eggs ... 9
Dried Flies ... 9
Hykro concentrated Goldfish food 1-0 & 2-0
Hykro vacation blocks ... 1-0

FRY FOODS

Brine Shrimp Eggs ... 1-6
Multifud Fry Food ... 2-6
Liquifry No. 1 (Eggfayers) 2-6
Liquifry No. 2 (Livebearers) 2-6
Sureagrow Fry Food ... 1-6

REMEDIES

Helamid ... 3-6
Detain Aquarium Salts ... 1-3
Wardley's Fungi Free ... 7-6
Clarvue (Clears Algae) 2-10 & 13-6

PLANT

Accessories

Plant Growing Compost. 2-6
Flora Pride ... 4-6
Planting Sticks ... 1-9

AQUATIC

Literature

Ditchfield Little Wonders All at 9d. each.
Garden Pool Construction
Tropical Fishkeeping
Goldfish
Coldwater Aquarium
Stocking Garden Pools
Tropical Aquarium for Beginners

Soft Cover Books

Tropical Fishes ... 2-6
The Goldfish ... 2-6
Live Foods for Aquarium Fishes ... 2-0
Garden Ponds ... 1-6
The Aquarium ... 2-0
Goldfish for the Novice ... 2-0

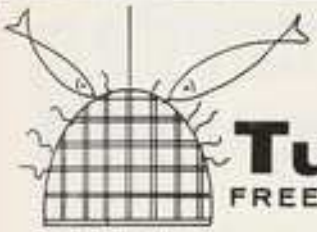
POND

Requirements

All pond plants, fishes, pool liners, planting baskets, etc., available in season.

Terms:— Cash with order. Carriage 2/6 up to £2, 3/6 up to £4. Over £4 free

THE NEW AND EXCITING STAPLE FOOD FOR ALL TROPICAL FISH.



METAFRAME

TubiCubes™

FREEZE DRIED TUBIFEX

★ Live tubifex are quick frozen to 40 degrees below zero and simultaneously dried under high vacuum.

★ This new method of preservation retains the original nutritional values.

GUARANTEED ANALYSIS

Minimum Crude Protein	50%
Minimum Crude Fat	1%
Maximum Crude Fibre	4%
Maximum Ash	8%
Maximum Moisture	5%

Retail price with special feeder 4/9
without feeder 4/3

FEED IT 3 WAYS

1. Insert a Metaframe® TubiCube™ into hole in bottom of special TubiCube feeder and allow feeder to rest on bottom of aquarium, or...
2. Press a TubiCube™ against the aquarium glass until it sticks in place... or simply...
3. drop one into the aquarium where it will float.

Within a minute the freeze dried tubifex will absorb water and appear to come to life. Your fish will find them irresistible.

MADE IN TAIWAN EXPRESSLY FOR METAFRAME®

SOLE DISTRIBUTOR FOR U.K.
INTER-PET
DORKING · SURREY
BE SURE TO ORDER
METAFRAME TubiCubes

THIS NEW wardley's FLAKE FOOD

is simply

WUNDERBAR

1 oz 3/6 2 oz 6/9 8 oz 22/6

The quality flake food at the economical price

TRY SOME SOON

U.K. Distributors

T.F.H. Publications (London) Ltd. 13 Nutley Lane, Reigate, Surrey.

BAF

BRITISH AQUARISTS' FESTIVAL

29th-30th October,
at Belle Vue Gardens, Manchester

- **Assembly programme: talks and film show 30th October**
- **Catering enquiries should be made to: Mr. S. Nicholls, 43, Shore Avenue, Shaw, Lancs.**

Admission Charges 3/-. Children half price. (also includes entry to Belle Vue Zoo and Amusement Park).

PHILLIPS fish food

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.

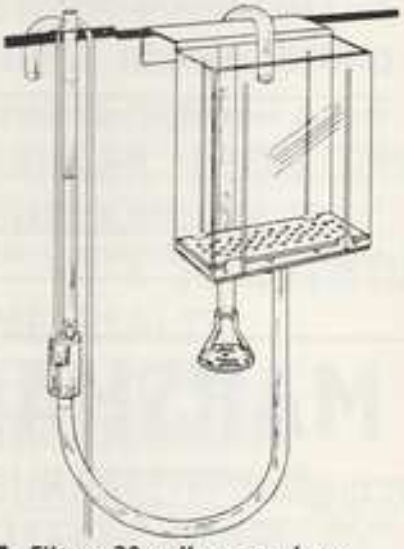
For all Cold-water Fish - - 1/9d
For Tropicals - - 1/6d

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

PHILLIPS YEAST PRODUCTS LIMITED, Park Royal, London N.W.10

This is the HALVIN

FILTERFAST — 11 Jnr. OUTSIDE FILTER



- **Filters 30 gallons per hour**
- **Robust construction**
- **Fits standard aquarium angle**
- **Unit complete with Suresynth & Surekarbon for immediate use**
- **Works from standard air pump**

Price complete **28/-** *from all good dealers*

A quality product by

S.C.A.N. LTD Colnbrook Slough Bucks

GO MODERN! GO FANTASY!

with the new

Fantasy Aquarium Gravel

Delicate Lavender, Brooding Midnight Blue, a suggestion of sunlight with Primrose, Fiery Red, Dramatic Black and White. (Neons and Cardinals are sensational against a solid black). So many colours, such vivid effects, all to be had with a little ingenuity and FANTASY AQUARIUM GRAVEL.

So, experiment! Let **your** artistry run riot! All you need is a little Fantasy Aquarium Gravel. It makes such a difference!

you'll see!

SPECIAL NOTE FOR VISITORS TO LONDON

Call at Tachbrook Tropicals, 244 Vauxhall Bridge Road, Victoria, and see the three magnificent display tanks showing the effectiveness of Fantasy Aquarium Gravel.

We guarantee that you won't have to ask which are the Fantasy Tanks!

FANTASY PET PRODUCTS., 13 NUTLEY LANE, REIGATE, SURREY.

MARSHALL'S AQUARIA

Phone: BUC 4708

26, WESTBURY LANE, BUCKHURST HILL, ESSEX

It is quite easy to get to Buckhurst Hill. By tube train on the Central Line thirty-five minutes from the West End, and we are three minutes from Buckhurst Hill station. Or by bus routes 20, 34A, 167 to Bald Faced Stag, five minutes walk from there.

OPEN SIX DAYS A WEEK 10.00 A.M. TO 6.00 P.M. (CLOSED TUESDAYS)

A WIDE RANGE OF **TROPICAL FISH** IN STOCK

OVER 120 TANKS ON SHOW

PLANTS IN STOCK

MINIMUM ORDER 10/- **POST PAID**

AMBULIA	8/- per doz.	VALLIS (Twisted)	8/- per doz.	CRYPTOCORYNE BALANSAE	3/-
BACOPA	8/- „ „	VALLIS (Straight)	8/- „ „	„ CILIATA	3/-
CABOMBA	8/- „ „	WATER WISTERIA	1/6 each	„ CORDATA	2/6
ELODEA-DENSA	6/- „ „	GIANT HYGROPHYLLA	1/6 each	„ HARTALIANA	2/6 to 4/6
HYGROPHYLLA	8/- „ „	APONOGETON UNDULATUM	2/6 up	RADICANS	7/6
LUDWIGIA	8/- „ „	AMAZON SWORD	5/6 to 7/6	MALAYAN SWORDS	4/-
MYRIOPHYLLUM	8/- „ „	AMAZON CHAIN SWORD	2/-		

Please send S.A.E. for price lists.
For wholesale plant list, TRADE headed paper please.
Please address all correspondence as address above.

DRIED TUBIFEX

THIS WONDERFUL NATURAL FOOD
FOR ALL FISH NOW AVAILABLE
AT ALL GOOD PET STORES

Also "STIMULITE" brand of Goldfish and Tropical Fish Foods

If any difficulty in purchasing, please send the name and address of your nearest dealer, postage refunded

WHOLESALE DISTRIBUTORS REQUIRED

Write to:

P. H. Hastings Ltd.

182, SULTAN ROAD, PORTSMOUTH

WE ARE THE SOLE IMPORTERS, PACKERS AND DISTRIBUTORS OF DRIED TUBIFEX FOR EUROPE

NOW
is the time

To fit a floating pond heater to your pond. Will keep a small space free from ice to let harmful gas out. **150 watts. Lotus Pool Heater.** 35/- + 1/6 p.p.

Set up a marine tank complete with Nylon tank 24×12×15. Plastic hood heater and holder, stat. thermometer, hydrometer, salts, silver sand. **£9-14-0.** With air pump **Rena Filter** and nylon wool clamps T piece plastic line **£12-10-0.** Coral 15/- per lb. Fish range from 25/-. Brown, Tomatoe, Sebae Clowns, Yellow tail, Domeno Damsels, Claetodans, Box Fish, Puffers and many more types.

50 tanks of tropical fish also Goldfish, Moors, Calico Fans, Golden Tench Lion-heads etc.

Phone: **Croydon 9165**
opp. A.B.C. Cinema Car Park

or Call at: **Broad Green Aquarium**
250 London Road,
West Croydon, Surrey

SEE THE
S.C.A.N.
RANGE
OF
RENA PUMPS
EHEIM POWER FILTERS
RENA HEATERS & STATS
SUREGOLD
SANDER OZONISERS
SUREKARBON
& SURESYNTH
MEERSALTZ
STAR PUMPS
TROPIC-MARIN
SUREGROW PRODUCTS
HALVIN FILTERS, ETC.

AT THE

B.A.F.

OCTOBER 29th-30th
BELLE-VUE
MANCHESTER

Well worth a visit

IF YOU DO MISS THE BOAT!

Visit our Aquarium Department . . .

Hundreds of Tropical Fish and Plants ■ Large Scats ■ Malayan Angels and Tropical Marines ■ FANCY GOLDFISH A SPECIALITY—Superb Large Pearl Scales, Lionheads, etc ■ Large POND FANTAILS ■ Coldwater plants including Vallisneria, Sagittaria, Lugwigia and many others ■ Bow Front Set-Ups ■ Plastic coated and stainless steel tanks ■ All accessories — Dynaflo Pumps, Eheim Power filters, etc ■ Reptiles include 4 ft. Nile Monitor, Water Dragon, Chameleon, Geckos, etc ■ Nos. 11 and 14 BUSES PASS THE DOOR ■ OPEN DAILY 9 a.m. till 6 p.m. including WEDNESDAYS ■

THE PORTSWOOD PET AND AQUATIC CENTRE

119 Portswood Road, Southampton — Telephone SOTON 56595

Cultivated Aquarium Plants

Elodea, Natans, Myrio Vertil, Parrot's Feather, Torta, Ludwigia, Bacopa, Hygrophilla, Spiralis, Lysimachia—**6d** each or **5/-** dozen.

Cabomba, Ambula, Rotala Rotundifolia, Pigmy Chain, Cardamine Rotundifolia, Water Ivy— **9d** each or **8/-** dozen.

Aponogeton Corms **1/-** each, Giant Sag, Water Strawberry, Water Nasturtium, Water Sedum, **1/6** each, Hair Grass, Nymphae Stellatus, Acorus Pusillus, **2/-** each, Banana Plants, Echinodorus Tuberose, Alternanthera Sessilius, Blyxa Japonica, Giant Hygro, Willow Leaf Hygro, Borneo Ferns, Water Wisteria, Dwarf Crypto's **2/6** each, Lobelia Cryptofolia, Fountain Plant, **3/6** each, Aponogeton Distachyon, Ophiopogan Variegatus, **6/6** each, Large Amazon Swords **4/6** each, Radicans, Acorus Intermedius, Barclaya Mottleyii, **7/6** each.

Please add **1/-** postage on orders under **15/-**

Victoria Aquatics,
Staithes, Saltburn, Yorkshire.

TRIFISH LONDON

IMPORT

Tropical *Coldwater*

and

Tropical Marine

All fish guaranteed in good disease-free condition
Wholesale List to Bona-fide Traders on application
Van delivery twice weekly in London Area

ALWAYS A GOOD SELECTION OF RARE TROPICAL FISH

53, Stowe Road,
SHEPHERDS BUSH, W.12

SHE 6883 CHI 4722

South Wales—Bridge That Gap and Call at

MAPSON AQUARIA

15 Perry Road, Bristol. 1. Tel. 26292

150 yards from city centre

Largest range of fish in the West
Tropicals, Coldwater, Marines
All Equipment. Tanks and Ponds
Tanks made any size or shape to order

Hours. 9.30 a.m.—6.0 p.m. 12.30 Wednesday 8.0 p.m. Friday

Daphnia and Tubifex usually available

VISIT THE SPECIALISTS FOR ONE OF SCOTLAND'S LARGEST DISPLAYS OF TROPICAL FISH AND PLANTS. ALL OF OUR FISH ARE FULLY QUARANTINED FOR AT LEAST SEVEN DAYS PRIOR TO SALE.

WE ARE MANUFACTURERS OF AQUARIUMS AND STANDS, SPECIAL SIZES MADE TO ORDER AT NO EXTRA COST.

Half Day: Wednesday Sunday Opening 12-5.30 p.m.

AQUASCENE INSTALLATIONS
84 Calder St., Blantyre, nr. Glasgow tel: 2307

Visit . . .

MRS K. COOPER
Bean Hatchery
Bean, Nr. Dartford, Kent

(Just off A2 Trunk Road, few doors from Black Horse P.H.)

▼

Large selection of

TROPICALS, PLANTS, ACCESSORIES

Call anytime including Sundays

I've Got Millions!

WORMS! FOODS! COMPOSTS! RESULTS!

EUGLENA	2/6—With 8 page instructional booklet
MICROWORMS	2/6—Complete with feeding powder
MICRO FOOD	2/6—Specially developed for Micro
GRINDALWORMS	2/6—Miniature W. Worms Easy to breed
GRINDALWORMS	30/—Mature cultures in wooden boxes
GRINDAL FOOD	2/6—High protein content. Rapid results
GRINDAL COMPOST	2/6—Finely ground with organic base
WHITE WORMS	2/6—With complete instructions
WHITE WORMS	30/—Mature cultures in wooden boxes
WHITE WORM FOOD	2/6—Exclusive formula. No mildew
WHITE WORM COMPOST	2/6—Compounded for quicker breeding

Breeder's packs: five times 2/6 quantity for 7/6

Ask your dealer, or free delivery from

E. ARNOLD, 80, MONEGA ROAD, LONDON, E.7.

REPTILES — AMPHIBIANS

Imports from all Continents

Write for current price list

Sole agency for England:

MR. ALAN COOK
"The Anton",
Beechwood Drive, Eaton, Congleton, Cheshire

●

DRS. W. DE ROVER
Ericalaan 9
Ermelo, Holland

W. HAROLD COTTON

F.R.M.S.

ICHTHYONOTOMIST

POST MORTEM EXAMINATION of Tropical and Coldwater fishes

Specimens should be wrapped loosely and very wet in greaseproof paper, surrounded by a damp cloth and then re-wrapped in dry greaseproof paper and sent in a strong container.

A brief history and any relevant details should be given. No preservatives please.

Examination fee 2/-

39, BROOK LANE, KINGS HEATH, BIRMINGHAM 14

Phone HIGhbury 1693

DEALERS ONLY!

WE WOULD LIKE TO THANK YOU for your magnificent response to our newly introduced MIRACLE FREEZE-DRIED TUBIFEX. We are dealing with orders for hundreds of packs daily and so far are pleased to say that we have managed to keep up with the phenomenal demand. One of your number said when ordering over 2,500 packs "I think this will be the biggest sensation to hit the aquatic hobby for years". Yet another Wholesaler confirmed "Dealers everywhere are reporting sensational results with it".

So once again we repeat our thanks to Wholesalers and Retailers alike and confirm that good stocks are still available in spite of the rush.

Considerable further shipments are on the way and are due in October. These, we hope, will meet the constant and ever-increasing demand for the remarkable new MIRACLE FREEZE-DRIED TUBIFEX.

T.F.H. PUBLICATIONS (LONDON) LTD.
13, Nutley Lane, Reigate, Surrey.
Phone: REIGATE 47395

PREPAID ADVERTISEMENTS

6d. per word (12 words minimum) Box number 2/- extra

FOR SALE

CALLING ALL AQUARISTS. Call and see our large selection of Tropical and Coldwater fish, Plants in variety. We also stock all accessories at "The Aquarium," 192, Wellingborough Road, Northampton. Phone 34610.

GLAZED aquaria in all sizes including 36 × 15 × 12, 75s. 0d.; 18 × 10 × 10, 19s. 6d.; 24 × 12 × 12, 42s. 6d., tanks despatched to any part of Britain, carriage extra. Plants, Accessories, Fish. Wright's, 10, Lorne Road, London, N.4. Phone Archway 3820.

TROPICAL FISH, fully quarantined, over 100 species offered at lowest prices. All aquarists' requirements supplied. Personal shoppers only. Sterling Fisheries, 62, Mayes Road, Wood Green, N.22.

GUARANTEED thermostat, heater and thermometer, 20s. post paid. State heater wattage. Sterling Fisheries, 62, Mayes Road, N.22.

CHELTENHAM AQUATICS (Prop. Mr. B. R. James). Largest selection of Tropical and Coldwater fish in Gloucestershire. Bow-fronted and Stainless steel aquaria Equipments, Reptiles and Amphibia and Everything for the Water garden. 11, Suffolk Parade. Tel: Cheltenham 24949.

WHITE WORM BY WEIGHT. 1 oz., 4s.; 4 ozs., 15s. Post paid. Visit our Hatchery—Fish and Plants in variety. Dene & Son, Desford Aquatics, Alcester Road, Portway, via Alvechurch, Worcestershire. Tel.: Wythall 2582.

GREENS OF BLACKPOOL for tropical and coldwater fish, plants, tanks and accessories. Open daily till 6.30 p.m. (Wednesday, 1.30 p.m.); Sunday, 10 a.m. to 1 p.m. 205, Waterloo Road, South Shore. Telephone 45869. Closed Whit Monday at 12.30 p.m.

TROPICAL FISH, all accessories, plants. Prince's Pet Stores, 142 Elder Road, Cobridge, Stoke-on-Trent.

RUSTPROOFED AQUARIA. Ornamental Stands, Glazing Cement, Equipment Manufacturers. S.A.E. Westbys, Barton, Ormskirk.

OLDBURY'S OF CHESTER. 100 varieties Tropical Fish, Freshwater and Marine. 40 varieties. Plants, Equipment, Live Foods. Evenings after 7 p.m. Weekends from 2 p.m. 36, Pearl Lane, Vicars Cross, Chester 41871.

PLYMOUTH TROPICALS for fish, plants and equipment. North Hill Nurseries, Tavistock Road, Plymouth. Tel. 82663.

PERRY'S for Plants. 1st and 2nd Awards British Aquarists' Festival. Assorted selections Tropical or Cold 7s. 6d., 10s. 6d., 12s. 6d. Val. Terra, Sagittaria Natans, 6s. per dozen. Crypstocoryne Beckettii, 2s. 6d. each; Willisii 2s. 6d.; Ruetelians 2s. 6d.; six assorted 10s.; Water Wisteria, Giant Hygrophila 2s. 6d. Post 1s. All Advertised Accessories. C. R. Perry, Professional Aquarist, 615, West Street, Crewe.

SUPERB VEILTAIL GUPPIES. Awarded "Water Life" diploma. Best in open show. £1 per pair, carriage 5s. 0d. C. R. Perry's Professional Aquarist, 615, West Street, Crewe.

AQUARIA FRAMES. For quality and accuracy buy direct from the manufacturer. 1 × 1 × ⅛ ins. steel angle: 36½ × 15 × 15 ins., £1 10s.; 36½ × 12 × 12 ins. £1 8s.; 30 × 15 × 15 ins. 27s.; 30 × 15 × 12 ins. 26s.; 30 × 12 × 12 ins. £1 3s.; 24 × 12 × 12 ins. 21s. 6d.; also 18 × 10 ins. 17s.; 18 × 12 ins. 19s., from ¾ × ¾ × ⅛ angle. All mitred and welds ground flush. Carriage paid. Any size made to order. C.W.O. Money refunded if not satisfactory. For complete list, stands, shades, etc., S.A.E. to J. E. Heeney, 52 Chester Street, Accrington. Phone Accrington 39535.

MICRO WORMS BY RETURN. Starter Culture, only 1s. 6d.
GRENDAL WORMS BY RETURN. Super Starter Culture, 3s.
WHITE WORMS BY RETURN. Super Starter Culture, 3s. All above cultures, post paid, with instructions. D. Joel, 10 Lee Road, Bowers Gifford, Basildon, Essex.

LOOK. Thermostat, heater, and thermometer, 17s. 6d. 36 × 15 × 12 angle-iron aquariums £4 10s., 24 × 12 ditto 49s. 6d., 18 × 10 pressed steel, 19s. 6d. Micro, Grindal and white worm cultures, 1s. 6d. Thousands of tropical fish and plants in stock at the right price. Large neons, 1s. 6d. etc. 10% discount off all pumps in stock; plenty of pond plants and goldfish; Otter pumps, fountain kits, p.v.c. and fibre-glass ponds; every assistance given to beginners. S.a.e. enquiries (wholesale and retail.) The Coventry Aquarist, 43 Melbourne Road, Coventry. Phone: COV 72772.

ANGEL AQUARIA, 47 West Road, South Ockendon, Essex. Tropical fish, plants, etc. Tel: South Ockendon 3810. Open till 9 o'clock all week. Saturday till 8.30 p.m. All day Sunday till 5.30 p.m.

KINGPETS keep fish in BATH, tropical and coldwater. Full range of equipment and books; bow fronts. Plants for pools and aquaria. Plastic and fibreglass pools, streams, fountains. Reptiles and other animals. 23 Brock Street, Bath, tel. 4028.

SELLING gorgeous mint stamps with pictures of "Fish". Aquaria Box 3936. Miami, Florida 33101. U.S.A.

80 VARIETIES of highly coloured tropical fish many rare, exotic and large. Prices from 1/-. Send 10/11 for fantastic bargain parcel of choice tropical plants. 30/- for very large parcel. Satisfaction guaranteed. Callers Thursday, Friday evenings or Saturday until 5.30 p.m. 209, Shenfield Road, Downham, Kent, Nr. Catford.

GUARANTEED QUALITY PLANTS. Ambulia, Bacopa, Hygrophila, Myriophyllum, Vallisneria spiralis, torta, Sagittaria, Hairgrass, 6d., 1s. 6d. dozen. Cryptocoryne beckettii, Haerelliana, Cordata, Wittata, Giant Hygrophila, 2s. each. Madagascar Lace Plant, 15s. Post 9d. all orders. Over 120 varieties Tropical and Coldwater Fish, some Mariners. Personal shoppers only. Closed Wednesdays. Kingfisheries, 138 Croydon Road, Beckenham. BEC 3716.

FOR SALE. Three 12 × 12 × 10 angle tanks and Hydo Piston Pump "B" and fish Corydoras, Large Pearl Gouramis, Dwarf, Veilfers, Zebras, Scissortails, Acaras, Black Widows, Livetail Mollies, Silver Shark 5 in. Platies, Swordtails, Albino Clarius, Angels, Tigers, and one tin 6 oz. Terra-Mix. Miller, 48 Stephendale Road, Fulham, S.W.6. Evenings, week-ends.

TROPICAL AND COLDWATER fish, Aquarium Plants, Reptiles, Water-garden sets. Full range of aquatic equipment. Mail Order service. A visit to Manchester is a chance to visit our showrooms. W. H. Smith Aquatics, 67 Reddish Lane, Gorton, Manchester, 18.

ANGELS, ANGELS, ANGELS, Home bred, larger than average, 4s. each, 6 for £1. Selection of fish and plants. Allen, 105 Tolmers Road, Cuffley, Herts. Cuffley 2214.

TIME-SWITCHES Reconditioned. 14 day clock, once on once off, every 24 hrs. Fully guaranteed. 15 amp. Venner 37s. 6d. 5 amp. with Horstmann 8 day Clock, 85s. 6d. P. & P., 3s. A. R. Batchelor, A.P. Dept., 4 Park Road, Bromley, Kent.

FISHERMAN'S COVE, 35 Monmouth Street (on main A38) Bridgwater, Som. The finest show of tropic. West of London. Extensive stocks of equipment, Bow Tanks S/Steel, etc. Open until 8 p.m. Fridays.

BRISTOL BLUE SHUBUNKINS. Breeders and young adults offered owing to curtailed breeding activities. Callers welcome. Johnson Hood, 46 Fernwood Avenue, Gosforth, Newcastle-on-Tyne.

HY-FLO PISTON PUMP Model "C" £8 or will exchange for Dynallo Motor Filter. S. Beggs, 44 Palmerston Road, Denton, Manchester.

1. There's something wrong with Fantasy Fish Food.
2. Want to know what's wrong with Fantasy Fish Food?
3. We'll tell you what's wrong with Fantasy Fish Food:
   Too few people know how good it is! Are you one of them?
   If so, get some soon and join the knowledgeable ones.

GREENHOUSE GROWN. Five water lettuce, five floating ferns, one portion salvinia, 15s. Giant water lettuce, 9 in.—13 in., five £1. Post and packing 1s. Bachelors Farm, Ockham, Surrey.

BLANKET WEED REMOVER. In stainless steel. Most effective removing, without damage, blanket weed from all plants. Price 3s. 9d. plus 9d. postage.

SHREDDERS. Made of stainless steel, the super combination comprises coarse tooth plate, fine tooth plate and top plate with handle. The shredders are the only instrument capable of reducing earthworms, whiteworm, meat, etc., to a size suitable for youngest fry. Use coarse plate for larger fish. Price 20s. plus 1s. postage.

GIANT SAGITTARIA. Young plants 5s., 7s. 6d., 8s. 6d. dozen. Large plants 1s. 3d. and 1s. 6d. each. Postage 1s. 3d.

SHUBUNKINS. Enquiries invited, visits by appointment only. S.A.E. E. S. Walker, 143-145 Bure Lane, Christchurch. P.S. Postal trade only. Local buyers see Cooks Aquaria, Branksmbe.

LARGE AQUARIA FRAMES. Shades, Stands. 36½ × 15 × 12 ins., 28s.; 1½ × 1½ × ¼ steel angle, 42 × 15 × 12 ins., 36s.; 42 × 15 × 15 ins., 39s.; 48 × 15 × 12 ins., 42s.; 48 × 15 × 15 ins., 45s.; 60 × 15 × 12 ins., 50s.; Aluminium Shades, 36½ × 12 ins., 28s.; 42 × 12 ins., 32s.; 42 × 15 ins., 36s.; 48 × 12 ins., 40s.; 48 × 15 ins., 45s.; 60 × 12 ins., 50s. Stands to take two tanks 18½ × 10 × 36 ins. high, 28s.; 18½ × 12 × 36 ins., 32s.; 24½ × 12 × 36 ins. high, 38s.; 30½ × 12 × 36 ins., 43s.; 37 × 12 × 36 ins., 48s.; 1½ × 1½ × ¼ steel angle, 42½ × 12 × 36 ins., 55s.; 42½ × 15 × 36 ins. high, 56s.; 48½ × 12 × 36 ins., 60s.; 48½ × 15 × 36 ins., 65s.; 60½ × 12 × 36 ins., 70s. Any size to order S.A.E., carriage paid. Money back if not satisfied. Cash with order. Hockney Engineers, Derwent Place, Bath Road, Leeds 11. Tel: 25081.

TAYLOR'S AQUARIUM, 76 Manchester Road, Burnley. Tel.: 30542. Quality aquarium plants our speciality. Complete selection equipment, accessories, tanks, stands, etc. Rare varieties tropicals available.

PLAQUES, SHIELDS, ETC.

R. HOLTON & SON, 309, Oldbury Road, Smethwick, 40. Plaques, Shields, Medals, Cups and Medallions for Aquarist and Bird Societies. Tropical and Coldwater fish centres in full colour. Write for details to above.

PUBLICATIONS

MY BOOKS are getting scarce. I estimate that within three months nearly all will be out of print. I offer single copies at 6s. each, or a complete set of six as long as they last at 32s. 6d., post free. Thomas Marshall, Aquaria House, 26 Westbury Lane, Buckhurst Hill, Essex.

WANTED

CERTAIN COPIES of American Aquarium magazines. Also pre-war issues of *The Aquarist* and *Water Life* magazines. Will buy or trade. Al Doom, 222 Wilson Street, Brooklyn 11, New York, U.S.A.

TACHBROOK TROPICALS

ENGLAND'S RENOWNED SUPPLIERS OF HIGH QUALITY

TROPICAL FISHES

Our showrooms have been specially designed to allow visitors maximum facilities for easy viewing of our extensive range of healthy, full bodied tropical fish. There are at all times, swimming in shoals, more than a hundred varieties shown to perfection in beautifully decorated tanks. The tropical plants too are selected for their size and colour and are all for sale. This truly is the aquarists' paradise but whether pundit or beginner our assistants are there to offer advice and help.

Our tanks are kept clear by the most perfect aid to easier Fishkeeping . . .
WINDMILL Biological Filter

The BIOLOGICAL FILTER since they were put on the market have proved a most valuable asset to fishkeepers. Once installed they assure complete freedom from mulm, assist in ridding decaying food and give absolute water clarity.

18" TANK SIZE (S) 12/6 — 24" TANK SIZE (L) 15/-
30" TANK SIZE (L) 15/-
36" TANK 2 SIZE (S) — 48" TANK 2 SIZE (L)

A VISIT TO OUR SHOWROOMS IS A MUST FOR ALL VISITORS TO LONDON

If you are unable to call please write for our
FISH, *and* EQUIPMENT CATALOGUES
All goods available by our return of post service

TACHBROOK TROPICALS

244 VAUXHALL BRIDGE ROAD, LONDON, S.W.1

2 Minutes VICTORIA STATION — Tel. VICTORIA 5179

Shirley Aquatics Ltd.

WATER PLANT NURSERIES AND FISH HATCHERIES—Phone: SHIRLEY 13

Stratford Road, Monkspath, Shirley, Solihull, Warwickshire

TROPICAL FISH

We carry an extensive range of Freshwater and Marine Tropicals.

Sixty-four aquariums displaying freshwater tropicals are supported by our fish-houses containing over five hundred aquariums and ponds so that no stock is ever kept in crowded conditions. All stock held in quarantine for a reasonable period and in many cases grown on for a few months before being offered for sale.

Eight sixty-gallon aquariums of Marines on display, supported by twenty stock aquariums ensure that usually we have a large stock of healthy Marines ranging from small damsels and clowns at 25/- each to rare and beautiful inhabitants of coral seas. We also carry an interesting range of invertebrates and living stones. Our fascinating living coral reef shows what is possible in an indoor aquarium.

Our plant list is the largest in the world. We list well over 200 different plants suited to indoor aquariums. Many of these plants are extremely rare and therefore not always available.

We carry a small range of Coldwater aquarium fishes and have particularly good stocks of pond-reared young and young adult Bristol Shubunkins.

With such a comprehensive range as we carry it must be appreciated that stocks fluctuate considerably and we invite customers travelling a great distance to telephone and enquire whether what they require is available. Stocks advertised one month may not be in supply the following month.

We are stockists of reliable equipment and accessories and are always pleased to give advice.

TROPICAL AQUARIUM PLANTS

NUPHAR SAGITTIFOLIUM
CAPE FEAR SPATTERDOCK
10/- each

WATER BANANA PLANTS
3/6 each 4 for **10**/-

CRYPTOCORYNE BECKETTII
3/6 each 4 for **10**/-

ECHINODORUS LONGISTYLUS
The Beautiful Melon Sword **10**/- & **15**/- each

RUFFLED SWORD (E. MARTII) **20**/-

BARGAIN COLLECTIONS

30 PLANTS (our Selection) **10**/-
50 PLANTS (our Selection) **30**/-
30 PLANTS (decorative collection) **40**/-

PLEASE NOTE—All enquiries requiring a reply MUST be accompanied by S.A.E. Our premises are situated on the main Stratford-Birmingham road, 8 miles from Birmingham, Midland "Red" Bus No. 130 from Bus Station, Birmingham, passes the door, alight at "The Crown," Monkspath.
HOURS OF BUSINESS—Weekdays 10 a.m.—5 p.m. Sundays 10 a.m.—12.30 p.m.
CLOSED ALL DAY EVERY MONDAY
TERMS OF BUSINESS—*Cash with order please.* Fish sent by rail. Tropical minimum order £7-10s., insulated container and carriage 10/-. Cold water minimum order £5 plus 10/- van and carriage. Plants by post (minimum order 10/-) please add 2/6 post and packing

Printed and Published by Buckley Press Limited, London and Brentford