

June
1967

2/6
monthly

the

Aquarist
and Pondkeeper



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 x 15 x 12	£ 7 7 0	£ 10 10 0
30 x 15 x 12	£ 9 9 0	£ 12 12 0
36½ x 15 x 12	£ 11 11 0	£ 14 14 0
48 x 15 x 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, SEDJETS, 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
- ZOUBEKO 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.

Premises closed Sunday and Monday throughout the year

WALTER R. SMITH LTD.

39 Tib Street and 16 Whittle Street
(Off Tib Street)

Manchester 4

Telephone: Deansgate 3961 and 3528

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

presents



Marine Tropicals, plus the usual large varieties of tropical fish.

Always in stock Eheim filter, Ozonator, Reactor, Waa pumps, Automatic fish feeder, Metaframe tanks, etc. And now Gro-Lux tubes 24" and 36".

(cannot be sent by post)

466 PAISLEY ROAD WEST, GLASGOW, S.W.1

Telephone: IBROX 3615

Open Sundays 11 a.m.—1 p.m.

PHILLIPS

The finest fish food

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

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

Coarse grade for Cold-water Fish 1/8
Fine grade for Tropicals 1/8

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

Phillips Yeast Products Limited,
Park Royal, London, N.W.10.



Breed your fishes *NOW*
using LIQUIFRY
as a first food



Mr. A. Boarder,

well known writer on aquatic topics and
show judge says

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

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

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

Price
2/6
per tube.

START YOUR BABY FISH ON LIQUIFRY AND WATCH THEM GROW!

Exported to 50 countries

INTER-PET* — *DORKING* — *SURREY

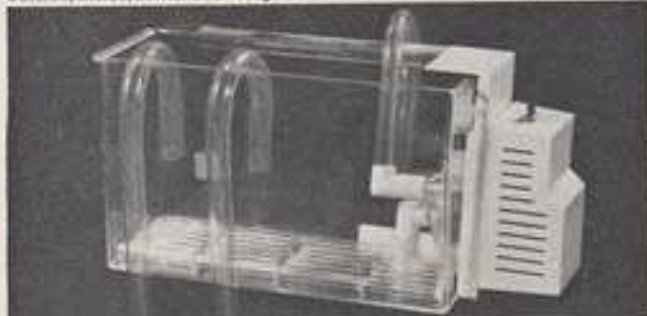
Sales Division of Liquifry Co. Ltd., Tel. 2566

Please write for our new catalogue

Are you a CHOOSEY aquarist?
If so T.F.H. has just introduced these
MIRACLE PRODUCTS . . . just for you!

THE MIRACLE HYDRAMATIC PUMP AND FILTER Price £7-15-6

This pump filters more than 200 gallons of water an hour. It has a magnetic drive and can be attached to any outside, inside, corner or undergravel filter. The most versatile pump ever to be placed on the aquarium market.



THE MIRACLE VIBRATOR PUMP Price 24-6

Illustrated

The Miracle Vibrator Pump is the most powerful vibrator pump available for the price. It comes with an extra seamless rubber diaphragm and is guaranteed for your protection. Its diaphragm arm vibrates on a bronze post so there is no metal fatigue. The case is three dimensional high-impact plastic that resists shock. The base is heavy solid rubber and is the most effective muffler available. Every part of this pump is the best that could be found to do the job, regardless of price.

THE MIRACLE SATURN VIBRATOR PUMP Price 32-6

Illustrated

Similar to the Miracle Vibrator pump but with double the power plus a built-in on/off switch.

THE MIRACLE TWIN VIBRATOR PUMP Price 45-

Not illustrated

The Miracle Twin Vibrator Pump is exactly what its name implies—Twin diaphragms, twin outlets complete with built-in on/off switch.



They're all in the shops now, see them soon!

SOLE U.K. DISTRIBUTORS:—

T.F.H. PUBLICATIONS (LONDON) LTD. 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 West End, and we are three minutes from Buckhurst Hill station. Or by bus routes 20, 38A, 147 to Bald Faced Stag, five minutes walk from there.

Minimum fish order £5 plus 12.6 carriage etc., please state nearest Main Line Station

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

LIVEBEARERS		MOONLIGHT		ANGUIDERUS AEWANI	
Veiltail Guppies	8/4 pair	4/- each	4/- each	4/- each	4/- each
Snakeskin	7/6	3/-	3/-	3/-	3/-
Adult Sailfin Mollies	15/-	Opaline	3/-	Black Angels	3/-
Black	3/- each	Jewel	3/6	Black Veil Angels	4/6
Lynetail	3/6	Dwarf	8/- pair	Phenophyllum Alcum	17/6
Veliers	4/6	Albino Paradise	3/6 each	Tilapia Lepidota	6/- sp
Liberty	3/-				
Speckled	3/-	RASBORAS		TOOTHCARPS	
Red Swordtail	3/-	Harlequin	3/-	Aph. Bicostatum	8/- each
Green	3/-	Firetail Rasbora	3/-	Es. Saxatilis	8/-
Yellow Wagtail Platys	3/-	Green eyed Rio	3/-	Cyno. Nigripinnis	27/6 pair
Blue	3/- each			Cyno. Whitei	27/6
Moon	3/-	BARBS		Notho. Gomberti	12/6
Sunset Varietas	7/- pair	Tigers	3/-		
		Albino Tigers	3/6	CATFISH	
		Fasciatus	4/-	Corydoras Aeneus	8/- each
		Clown	4/6	Jelli	7/-
		Nigger Adult	6/-	Spirurus	7/-
				Malinotus	5/6
		DANIOS		Upside-down Cats	8/6
		Zebra	1/-	Clarus Cast	4/-
		Giant	3/-	Hoplosternum	18/-
		Pearl	2/6		
		Spotted	2/6	A.O.V.	
		Lacopard	2/6	Silver Shark	25/- each
				Red Tailed Shark	4/6
		CICHLIDS		Diamond	12/6
		Rambrei	8/- up	African Kribia Fish	8/6
		Kribia	4/- 5/6 each	Head Fish	20/-
		Nannacara Anomala	4/-	Butterfly Fish	10/6
		Jewels	4/- 5/6	Elephant Nose	17/6
		Firemouths	4/-	Sucking Loach	1/6
		Blue Acara	3/-	Bumble Bees	3/-
		Brown Acara	3/-	White Clouds	1/6
		Kribia	15/- each		
		LABYRINTH			
		Figthers Male	1/6 up		
		Female	1/6 each		

★ PLUS A SELECTION OF MARINE FISH AND LARGE SELECTION OF POND FISH ★

Minimum order 10/-

PLANTS IN STOCK		Post Paid			
Ambulia	8/- doz	Crypto. Cillaria (Broad Leaf)	3/- each	Water Wisteria	1/6 each
Cabomba	8/-	Cillaria (Narrow Leaf)	3/-	Amazon Swords	5/6
Hygrophila	8/-	Coriaria	3/-	Malayan Swords	4/6
Vallis (Twisted)	8/-	Griffithi	2/6	Banleya Longifolia	7/6
Ludwigia	8/-	Berketzi (Large)	4/6	Tagetaria Loreata	2/-
Elodea Densa	4/-	Nevilli	3/-	Subulata	8/- doz
		Nariti	3/-	Aponogeton Crispum	4/6 each
				Utracae	18/-

Please send S.A.E. for price lists.
For wholesale lists TRADE headed paper please.
Please address all correspondence at address above.



TROPICAL FISH AND AQUARIUM SUPPLIES



NOW AT OUR NEW ADDRESS:
568 GT. HORTON ROAD, BRADFORD, 7

Large spacious showrooms with 160 metaframe stainless steel aquariums full of fish.

A complete range of equipment and our usual friendly welcome await you.

DON'T DELAY, COME RIGHT AWAY

We are pleased to announce the appointment to our staff of Mr. Gordon Holmes, the well-known aquatic authority and B.A.F. Judge. Gordon will be available to help answer all your fishy problems.

Have you had our 1967 Aquarist catalogue yet?
Send now, only 6d.

Postal and rail services, fish and equipment,
second to none

KEITH BARRACLOUGH
568 GREAT HORTON ROAD, BRADFORD, 7. YORKS

Tel: 73372

Half-day closing Wednesday

Open until 8 p.m. Friday evenings

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

- 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.
- 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.
- PLANT GROWTH**—in tanks fitted with the Premier Biological Filter, plant growth has been more healthy—plant roots do not rot away.
- WATER CLARITY**—tanks are kept suspension free, always crystal clear water. The Premier Biological Filter continually filters and purifies the water.
- 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.
- 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 sensors. 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: 01-834 5179

THE RENA '100'



35/-

BY REPUTATION BRITAIN'S BEST SMALL PUMP BUY.
Silent operation, coil embedded in plastic to avoid damp. Built to the expected **RENA** high standard. Part of the Rena range of aquarium equipment available from your local dealer.

Sole distributors

SOUTH COAST AQUATIC NURSERIES LTD.
OLD BATH ROAD, COLNBROOK, SLOUGH, BUCKINGHAMSHIRE

THE BRIXHAM BIOLOGICAL SUPPLIES

Specialist suppliers of

**REPTILES
AMPHIBIA
FISH, PLANTS and
ACCESSORIES for the
GARDEN POOL**

**THE BRIXHAM
BIOLOGICAL SUPPLIES,**
25 Elliott Grove,
Brixham, Devon.
Tel: Brixham 2688

Reptiles and Amphibia: The following hardy species are now available from stock: Green Lizards 10/6; Wall Lizards 5/-; Grass & Dice Snakes 10/6; Whip Snakes 12/6; Terrapins from 7/6; Tree Frogs 3/-; Green Toads 3/6; Alpine Newts 4/-; Great Newts 3/-; Salamanders 12/6; Sun Gazer Lizards £3/5, and many others.

Exotic varieties include African Rock Pythons £4; Rock Agamas 25/-; Egg-eating Snakes 80/-; Geckos 17/6; Skinks from 15/-; Chameleons from 25/-; Leopard Tortoises from £4; Side-necked Terrapins 62/-; Clawed Toads 12/6; Leopard Toads 17/6. Many others available from stock or expected shortly. SEND FOR FREE LISTS.

Water Gardening. Our 1967 price list giving accurate descriptions of over fifty varieties of water lilies, marginal and aquatic plants, is now ready. The list includes a useful guide to planting and stocking the pool with fish. Write for free "Water Gardening" price list NOW.

Prompt despatch to all parts of Britain.

Visitors to our nursery by appointment only.

TRADE ENQUIRIES WELCOME



AQUAFOOD

THE PREMIER FISHFOOD

Aquafood was first introduced 40 years ago and has stood the test of time. A balanced food—your fish will thrive on it. Get some now and see the difference.

IN 2/- DRUMS FOR AQUARIUM FISH
IN 2/- CARTONS FOR POND FISH
FROM YOUR LOCAL PET STORE



Manufactured by
CHAS. PALMER & SONS (LONDON) LTD. 66-70, Selater St., London, E.1

Vitakraft

Antimaladin

2 in 1 Aquarium Remedy



Antimaladin the new universal aquarium remedy combats most diseases including ick, fin and tail rot and all fungi. It also eliminates contagious diseases and provides essential minerals. It will do your plants as much good as your fish. Highly concentrated—one bottle will treat 100 gallons of water.



A remedy-preventative especially for ichthyoptirius and eliminates algae.

The new aquarium tablet plant food and fertilizer. Creates magnificent growth of even the most delicate plants.



The safe aquarium aid for rapid removal of chlorine also stimulates plant growth.

The all in one vitamin complex. Contains all essential vitamins for fish and plants.



ERIC WOODS (ROSEWOOD) LTD.
ARLESTON, WELLINGTON, SHROPSHIRE.

Telephone: Wellington 2854

Wholesale Distributors Required.

THE VIVARIUM



by George F. Hervey
and Jack Hems

Illustrated by Eileen M. Hill

Reptiles and Amphibians are becoming increasingly popular as pets, but very few books explaining how to care for them in health and sickness are available. In *The Vivarium* the authors, whose practical experience of keeping reptiles and amphibians both indoors and out of doors extends back for more than a quarter of a century, tell the reader all he needs to know about how to keep these animals in captivity. An important feature of the book is that the authors have succeeded in imparting their knowledge of vivarium management in a readable style, and the text is packed with interesting facts. Frogs and toads, newts and salamanders, tortoises and terrapins, lizards and snakes are all considered. The crocodilians have not been forgotten, but as they are problem pets they are dealt with separately in an appendix.

Eileen Hill's illustrations reach the same high standard as the text.

16s.

Faber & Faber

24 Russell Square London WC1

**ONE OF ENGLAND'S FOREMOST
AQUARISTS THAT YOU CAN RELY ON**

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

NOW ARRIVING REGULARLY

MARINE AND FRESHWATER TROPICALS

FROM ALL OVER THE WORLD



WHOLESALE ORDERS EXECUTED IMMEDIATELY

APPROXIMATELY 40 VARIETIES

OF MARINE TROPICALS

USUALLY IN STOCK.



CHISWICK AQUARIA
136, CHISWICK HIGH ROAD, LONDON, W.4
TELEPHONE: 01-994 6549
CABLES: CHISAQUA, LONDON, W.4

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

QUEENSBOROUGH FISHERIES

111 GOLDHAWK ROAD,
SHEPHERD'S BUSH, W.12
(1 minute from Shepherd's Bush Market)
Telephone: SHE 2738
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: WRAYSBU 2881
THURSDAYS 9 a.m. to 3 p.m.
SUNDAYS 9 a.m. to 3 p.m.

16 PICTON PLACE,
LONDON, W.1
(1 minute from Selfridges)
Telephone: WELBECK 0428
Hours of Business: MON. to FRI.—
9.30 a.m.-4 p.m. SAT. 9.30 a.m.-5 p.m.

VISIT WRAYSBU ury

SUNDAYS 9 a.m. to 5 p.m. THURSDAYS 9 a.m. to 5 p.m.

Large stocks of tropical fish and plants, pond fish and coldwater plants. Breeding Pairs of Goldfish from 20/- also Tench, Carp, and Orfe.

SPECIAL PLANT COLLECTIONS (post only)

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

TROPICALS	POND PLANTS	AQUARIUM OR POND
No. 1 30 plants including Dwarf Lily Cryptocoryne Heteris etc. £1	No. 8 50 plants including Marginals £1	No. 15 12 Sagittaria 4 Myriophyllum 4 Ludwigia 4 Moneywort 4 Hornwort 1 Portion Riccia 3 Portulaca Hair Grass £1
No. 2 12 Vallneria Torta 12 Myriophyllum 3 Myrs Sagittaria 4 Ludwigia 4 Elodea Densa £1	No. 9 20 Pond Plants 1 Cream Water Lily (Prince Altes) £1	No. 16 50 Plants for your Aquarium—Value 30/- £1
No. 3 12 Vallneria Torta 4 Myriophyllum 4 Ludwigia 4 Elodea Densa 4 Bacopa 1 Amazon Chain Sword 1 Portion Hair Grass £1	No. 10 2 Bull Rush 3 Iris 3 Sory Rush 3 Farges-Phe-Ness 3 Water Plant 10/-	No. 17 4 Vallneria Torta 4 Moneywort 4 Elodea Densa 3 Hornwort 3 Portulaca Hair Grass 10/-
No. 4 1 Nympha Stollia 1 Giant Hygrophila 1 Aponogeton 1 Wisteria 1 Giant Sagittaria 1 Cryptocoryne 1 Indian Fern 1 Portion Hair Grass £1	No. 11 12 Marginals 4 Oxygenating Plants 10/-	No. 18 1 Willow Cyp 2 Carex 2 Haerzblatt 2 Amazon Chain Swords 10/-
No. 5 4 Vallneria Torta 4 Myriophyllum 4 Hygrophila 4 Elodea Densa 10/-	No. 12 4 Vallis 4 Moneywort 4 Elodea 3 Hornwort £1	No. 19 4 Mono Beg 4 Bacopa 2 Amazon Chain Swords 1 Portion Riccia 10/-
No. 6 4 Ludwigia 4 Cabomba 4 Ambulia 4 Vallis £1	No. 13 Water Lilies 1 Pink 1 Red 1 Cream 3-year-old plants £2	No. 20 2 Giant Hygrophila 2 Giant Sagittaria 1 Wisteria 1 Nympha Stollia 10/-
No. 7 Riccia 2/4 portion	No. 14 Willow Trees Package 2/- 7/6	TROPICAL OR COLD
	Lilies Dark Pink 15/- Tuber Roses 15/- Blue Pink 15/- Yellow 15/- White 12/6	No. 21 Giant Amazon Sword Plants 4-8 inches 7/6
		No. 22 Water Lettuce Very beautiful plants or 3 for 10/- 2/6

SPECIAL Algae eating pond snails 1/- each

The AQUARIST AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"



Vol. XXXII No. 3 June 1967

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.

Editor: Laurence E. Perkins

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

	Page
Danios in the aquarium	55
The midshipman (<i>Porichthys notatus</i>)	56
<i>Labeo nana</i>	58
The yellow flag	58
Fancy goldfish—the Moor	59
The Junior Aquarist	
Waterlife pests and friends—the cyclops	60
A pike in the aquarium	60
See how they grow!	61
Photographing fish	62
The tiger loach (<i>Betta kymonophysis</i>)	63
What is your opinion? No. 2	63
Readers' Queries Answered	64
<i>Corydoras aeneus</i>	66
The Pipe Fish	67
Hong Kong finds gold in a fish tank	68
The China Mark moths	69
Our Readers Write	70
Full details and awards of "Champion of Champions" contest	72
Going marine Part 5—Diseases	74
Stone-fly larvae	75
Aquarium filtration	76
His excellency the Emperor Tetra	77
News from Aquarium Societies	78

Danios in the aquarium

by T. Hinitt

THESE attractive little fishes fall into two distinct species, namely *Danio* and *Brachydanio*. Of the two, the danios are the larger fishes and there are some four different varieties. *Brachydanio* is comprised of somewhat smaller specimens but the two will inhabit the same tank in perfect harmony, both having the same requirements in the way of water conditions and food. Preferably a tank for these fishes should be of ample size as they are of an extremely active nature and like to swim ceaselessly in the upper layers of the water. To make them feel really at home, strong aeration should be provided. The ideal instrument to provide this water movement is the Eheim power filter. These are really excellent high power filters as they can put through about 60 gallons an hour, thus ensuring even heat distribution and aeration throughout the aquarium. If one of these is not available, any ordinary outside filter will be quite sufficient. Personally I would not include plants in the danio's aquarium. This is for two reasons: 1. Plants tend to restrict their swimming room, 2. They will not flourish where there is very strong water filtration. Instead, alternative decoration can be provided by the careful selection and siting of rockwork or pieces of well water-logged wood. The latter is usually obtainable from any small stream but should be carefully inspected before it is added to the tank. This is to ensure that it is not rotten and does not harbour any unwanted guests (leeches, etc.).

All the danios are extremely tolerant of changes in water temperature. This is because the streams that they inhabit quite often dry up until there are only small pools of water left for the fish to live in. These pools often reach temperatures in the upper 90s by day whilst they may drop down to as low as 65°F during the night. In the aquarium the temperature should be maintained at about 78°F. At this degree of warmth they will show a good colour and remain very active. At lower temperatures they tend to become rather pale as well as becoming considerably less active. This can be said for many species of tropical fish

Continued on page 75

The midshipman—(*Porichthys notatus*)

by Richard Guppy

A GREAT many species of fresh water fishes can be persuaded to breed in aquaria so that their breeding habits can be easily studied and even photographed. Very few marine fishes will oblige in this manner and the inaccessible nature of their natural habitat puts a study of their family life out of reach of the amateur not equipped with expensive apparatus. These were the thoughts that came to mind when I first made the acquaintance of the midshipman, *Porichthys notatus*.

When adult, at least, the midshipman is evidently a bottom dweller. This fact is indicated by the pelvic fins clearly designed to act as prolegs and the colour which serves to camouflage the fish on a sandy or muddy substratum. Free swimming sea fishes are usually blue or green above and silvery below, except those living in deep water which are often red.

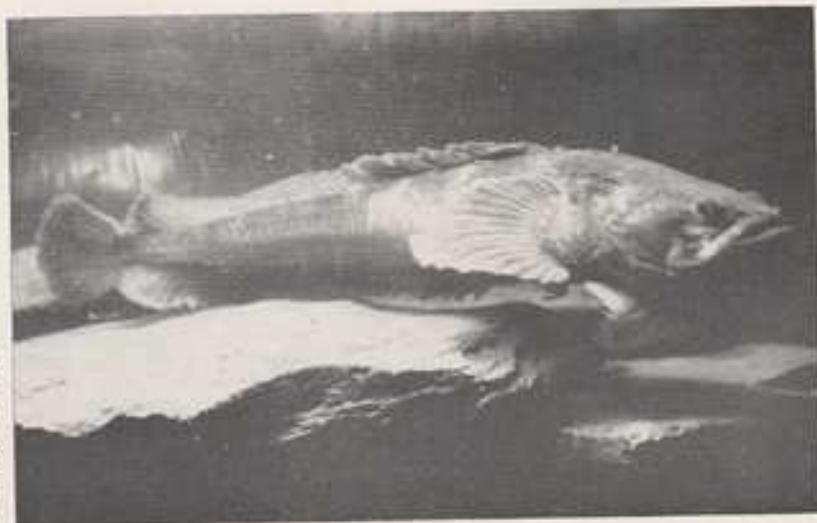
When alarmed the midshipman spreads its gill covers and the impression is given of a broad, flat head and rounded snout. The whole effect is reminiscent of a fish of the family Cottidae which we call sculpins, though other names such as miller's thumb and bullhead are often used. I was completely fooled by this and setting out to identify my first midshipman, without preliminaries I flipped open the reference book at the section on the Cottidae and for some time tried desperately to force my specimen into admitting that it was a sculpin. Actually the midshipman is too unique to be mistaken for anything else. It belongs

to the Batrachoididae, or toad fishes which is the sole family of the order Haplodoci. Moreover, the midshipman is the only member of its family found on the Pacific coast of Canada. When placed in a glass sided tank and allowed to settle down, it appears as having a rather pointed snout and long sharp teeth such as no sculpin ever possessed. Though Clemens (1946) says that the midshipman can attain a length of 15 inches, all that I have seen were from 8 to 12 inches, the females averaging smaller than the males. The common name is derived from the large number of photophores (small luminous dots) which form several lines running the length of the fish's body. They are supposed to resemble the buttons on the uniform of an old time midshipman.

Since the midshipman is described by Clemens as being common in the Strait of Georgia and off the west coast of Vancouver Island, I must conclude that, either the distribution is decidedly spotty, or its breeding requirements are very specialized. At different times in my life I have spent a number of years both on the west and east coasts of Vancouver Island with plenty of opportunity for fossicking and rock turning on the beaches. But before coming to live on Thetis Island in the Strait of Georgia, I never came across a midshipman. Every spring considerable numbers come into the intertidal zone of one bay of this island for breeding purposes.

Far right—A rock overturned to show midshipman eggs attached. A number of other marine organisms are also shown.

Right—Midshipman. (*Porichthys notatus*)



It seems quite possible that this bay is especially suited to their needs since there are not many like it in the area which is inclined to steep shores and strong tidal action. The bay in question, an arm of Telegraph Harbour, is about $\frac{1}{2}$ mile wide, and for a distance of over $\frac{1}{2}$ mile, the water is no more than 12 feet deep at low tide although only a small part becomes completely exposed. It is very sheltered and free from wave action and tidal currents.

Here male midshipmen begin to select their nesting sites in April and by late May almost every suitable rock along the beach at the head of the bay is occupied. A suitable rock means one situated at something less than half tide level, reasonably flat below, seated firmly on flat mud-sand bottom and covering at least a square foot or so. The fish get under these rocks, presumably by loosening the sand with their fins, especially the pelvic fins which are situated well forward and appear suited for this purpose. A small basin is hollowed out sufficient to hold an inch or two of water when the tide recedes. The procedure thereafter is familiar to all who have observed nesting fishes including the lowly stickleback. After a time a female fish will arrive and deposit her eggs to be fertilized by the male who then remains on guard to do what he can in the way of driving off predators and keeping the water circulating around the eggs.

In the Strait of Georgia during the summer months low springs always occur in the daylight hours. The hot sun beats down on the rocks under which the fish lie, raising the temperature of the puddle underneath to a point far above that of the returning tidal waters. It is interesting to note here that the toad fishes are mainly tropical in distribution. We have many well known examples of animals returning to an ancestral environment for breeding

purposes; perhaps the midshipman does just that in a less obvious way. I have not been able to find any statements in the literature to the effect that the midshipman deliberately selects locations in the intertidal zone for its nest or that it never nests in deeper water. But if we observe the habits of other species we must conclude that fish can estimate the level to which the tide will ordinarily recede and will act upon this knowledge. There are several species of Cottidae as well as the commercially important lingcod, *Ophiodon elongatus*, which habitually spawn just below the low tide level. This trick could easily be worked, of course, by the fish remaining on the selected site for a week or more before using it, testing it out, as it were. It does not seem so likely that a fish would carry out this stunt to select a site that could dry out. Midshipman nests below the tide level could easily be mistakes, but those higher up are not; some are 4 feet above the level of low springs. The most conservative conjecture regarding these must be that they are the result of indifference.

By early June spawning has commenced. When we consider the thousands of eggs produced by a single female of many species, the potential progeny of a midshipman are surprisingly few. One 8 inch female which I examined contained 120 eggs. These eggs are bright orange and as large as peas. They are attached to the lower surface of the rock in a single layer. Most nests which I examined contained some hundreds of eggs, evidently the work of several females. Male midshipmen apparently do not show the territorial possessiveness so evident in sticklebacks, sunfish, and many others. I have found 2 male fish under the same rock guarding a fine batch of fry as evidence that this team work was quite in order.

I found the first fry about the middle of July. Thus hatching seems to require about six weeks. After that the young fish remain attached to the rock for another week or more before the yolk is absorbed and they become free swimming. Turning a rock at this time can provide quite a sight, a shiny wriggling sheet of tiny fishes entirely covering a square foot or more of the rock surface. If the rock is carefully replaced no harm is done to the fish. During periods of low tide the water trapped under the rock seldom reaches the eggs or young fry, a circumstance which does not seem to bother them in the least. These young fish are much more showy than the adults being silvery below, the upper parts marked with a number of transverse bands of dark brown on a lighter ground. In late summer, when the tide is high after dark, young midshipmen up to 2 inches in length can be spotted with the aid of a good light. They lie quite motionless in a few feet of water but well clear of the bottom.

Many sluggish animals which at some time in their lives occupy small dark cavities squeak or hiss when disturbed in their retreats. It seems that this action must have some effect in deterring a predator from investigating further. The midshipman produces a noise for this purpose by



Ludwigia natans

by B. Whiteside



COMING from marsh or bog areas in the warmer parts of North America, *Ludwigia natans*, sometimes called *L. millerii*, is one of the cheaper aquarium plants, costing about 6d. Despite its cheapness it is a plant which is most useful. The colour of the plant is variable, usually with pale green to brownish upper surfaces on the leaves, and darker brown to reddish under surfaces.

There is another form which has red coloured leaves, this being a most attractive plant in a colour which is rather uncommon in aquatic plants. The red form usually costs a few pence more than the commoner form. Unfortunately, all the plants of the red form which I have purchased have only produced new growth of the normal colour, this probably being due to the red form having been grown under natural sunlight and then receiving only tungsten bulb lighting in my aquaria. Another suggestion that has been made is that iron salts in the growing medium contribute to the red colour of the foliage. This could indeed be the cause as my own gravel was specially chosen to contain no iron compounds.

L. natans produces, in pairs, opposite, leaves about

1½ in. long by 1 in. broad, the leaves being borne on short petioles. The plant grows reasonably fast and can soon reach and grow across the water surface of the aquarium. It is a plant which appreciates some form of feeding at its roots and this can be supplied in tablet form or by having a layer of compost under the aquarium gravel. The plant is easily propagated vegetatively in that it easily produces side shoots from the leaf nodes and it is only necessary to cut off a portion of the stem complete with and underneath a rooted node, and to plant this with about ½ in. of stem beneath the gravel after removing the lower one or two pairs of leaves. One small fault of the plant is that as it ages it is inclined to drop its lower leaves. When this happens younger top growths can be planted to replace the older plant.

Plants like good lighting and look best when massed together in clumps of several. The following are the conditions under which my plants are thriving; temperature 76 F.; pH 7.2; DH 5°; with feeding supplied by tablets of aquatic plant fertilizer pressed into the gravel near groups of plants.

Plants seem to like water which is fairly soft and given this, plus other conditions similar to the above, will provide a useful cover or screen which is not only beautiful to the eye, but cheap to purchase and easy to propagate.

The yellow flag

by B. Fry

OUR native yellow flag (*Iris pseudacorus*) makes a fine splash of colour about June. As a plant for the garden pond it has the advantages of being easy to grow under a few inches of water or in a boggy surround. In a rich loamy compost, in full sun, the upstanding sword-like leaves with raised midribs, will attain a height of about 3 ft. Two or three bright yellow iris flowers are produced at the top of each stout stem. The thick root-stock spreads horizontally over, or just under the growing medium. *I. pseudacorus* will not make much, if any, show the first year of planting, but in succeeding years it will reward you with an ever-increasing bounty of beauty.

I. pseudacorus is found not only in the wild state in this country but also over a large part of Europe and temperate Asia. Its specific name was given it to distinguish it from *Acorus calamus*, popularly known as the sweet flag, the leaves, but not the roots, of which resemble those of the yellow flag. The roots of both these native plants have their uses in herbal medicine, chiefly for the relief of stomach upsets, toothache and irritations of the larynx.

THE AQUARIST

Fancy goldfish—the Moor

by A. Boarder

THE Moor is a striking type of fancy goldfish and demonstrates the wonderfully strange development of the art of producing a fish so different from its ancestors, the common goldfish. Anyone seeing a veiltail moor for the first time would find it hard to believe that this fish is a result of working on a sport from the original type. The Moor is jet black, and this black should be as sooty as possible with no sign of bronzing. As no fish can be called a Moor unless it is black, it is strange why the term, "Black Moor", still persists, even among dealers who advertise these fish. Another point about the Moor is that it has telescopic eyes which protrude well away from the head on short stalks.

There are two types of moor recognised today, the fantail and the veiltail. The veiltail moor is the most attractive but perhaps the harder to breed true to type. These fishes are fairly hardy and could be kept in the garden pond throughout the year but the veiltail moor, having flowing finnage, would be liable to contract fin congestion and fin-rot in cold weather. It might be safe to keep the fantail moor out of doors all the year especially in the south of the country.

The fantail moor should conform to the general shape of the fantail. It should have an oval body with a clear rise over the back from the head to the caudal peduncle. No hump or sinuities should be visible. The lower curve of the body should correspond to give the fish an almost hen's egg shape. The dorsal fin should be well developed and held erect and more than half the depth of the body. The pelvic and pectoral fins are full but pointed. The anal fins are double and held horizontally. The caudal fin or tail is completely divided, the lobes being well forked and not drooping as in the veiltail. The eyes should be protruding with a clear cornea. The colour must be a sooty black with no bronzing. This black is a dull colour, not with any metallic sheen. Many otherwise good fish are found to have bad bronzing under the body.

The veiltail moor conforms to the general shape of the veiltail, that is, the body should be as round as possible, approaching a sphere. This description may be a bit of an exaggeration but it is intended to convey the fact that the nearer to roundness the body is the better the shape of the body. The back must not be humped nor have a bad lumpy joint at the caudal peduncle where the tail commences. Some fish are seen with a bad join at this point allowing the tail to fall away suddenly leaving an unsightly joint.

The dorsal fin is well developed being as high as the depth of the body. It should be erect with the front edge curved back and the hind part of the fin should be concave at the top but convex at the base. The pectoral and pelvic fins are long and pointed. The anal fins completely divided. The caudal fin or tail must be divided and broad and long. It should hang in graceful folds and be as straight as possible at the base. A bad forking is often



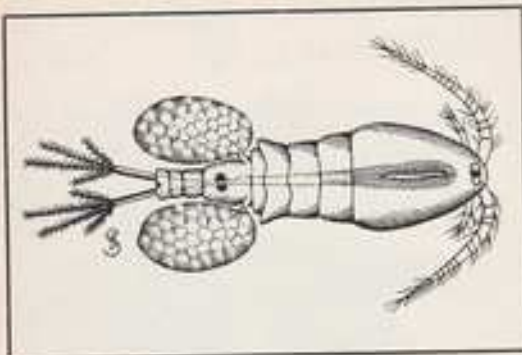
seen at the base of the tails of many veiltails and this is a bad point when exhibiting.

The eyes should again be well protruded and with a clear cornea. The colour should be a dull black with no bronze showing. The black soon appears on good youngsters and it has been my experience that the sooty black so desired can be spoiled by giving the fish too high a temperature which seems to turn the lower part of the fish a bronze, metallic colour.

There are no particular difficulties in breeding these fishes but patience must be exercised as one cannot expect a very large proportion of the youngsters, even from the best of parents, to be all of show quality. In fact if a dozen from a brood of a hundred turned out show specimens one should be well satisfied. Obviously the better the parents the better can the young be expected to turn out. However this is not the whole point to watch when choosing breeders. The more important thing is to find out if the fish were bred right. By this I mean having come from a long established strain. In such cases it is often possible to get excellent fish from a pair which although not perfect in themselves carry the genes of inheritance and can produce much better fishes than they are themselves. It would then be up to the aquarist to pick from the youngsters the best ones for further breeding. As with breeding most fancy goldfish, it must not be expected to breed a number of show specimens without plenty of patience. It took me nine years to breed from my stock of fantails before I could produce a number of winning fish.

The pointings for judging of the Federation of British Aquatic Societies for these fishes at the time of writing is: Type and colour, 40; body, 20; fins, 20; condition and deportment, 20.

Continued on page 67



The Junior Aquarist

The cyclops, a female specimen

Waterlife pests and friends—the cyclops

by Bill Simms

WHEN live daphnia are introduced to an aquarium another rather smaller creature will often be seen swimming with them. Its progress through the water is faster and more direct, though it seems to lose interest in that direction rapidly, and soon moves at a different slant.

This little creature is the Cyclops, of which there are a number of species fairly common in British waters. Sometimes they are just bulbous at the front with a spike at the rear, and these are the males and youngsters. Females are like the drawing, with a couple of egg sacs showing quite clearly.

Two kinds of eggs are laid by the females. The first are quick in developing and after being carried around by the female for a short time in the two egg sacs, hatch out into free-swimming larvae. These are called nauplii, and they go through a number of moults. At first they are distinctly different in appearance to the adults, but each moult adds more adult features.

The second kind of egg is a "resistant" type, for it has a harder coating and more yolk. These develop very slowly in the mother's egg sacs, and can lie dormant for periods that vary according to the time of the year, or the weather.

In addition to the resistant eggs, the adults also have a means of survival in difficult times. They can secrete a special slime which, when mixed with tiny mud particles, forms a special cell or cyst, within which they can lie fully protected until conditions are more suitable for them.

Because of these survival factors, cyclops can inhabit very small patches of water, and even those that partially dry out at times. This is why we find them in so many places we would consider unsuitable.

Cyclops are good food for aquarium fishes, though some of the smaller tropicals do seem to avoid them if the larger

and softer skinned daphnia are available. Cyclops are often about when daphnia cannot be found but rarely in the dense masses one so often finds on a daphnia hunting expedition.

In general the best places to find cyclops are among the plants near the water's edge when the water is clear, or out in the open water when plankton and algae tend to cloud the water. Under these last conditions I have found large masses of them on occasions, but only rarely.

No harm to fish is ever done by cyclops so that the sight of that erratically darting creature may safely be ignored. When eventually it is caught and eaten by a fish it will provide that little extra bit of variety to the diet.

A pike in the aquarium

by Leon Thorn

"FIRST catch your hare . . ." advised the celebrated Mrs. Beeton as a preface to one of her recipes, and a similar remark could equally preface a "recipe" for keeping *Esox lucius*, otherwise the freshwater shark—otherwise the pike—in the home aquarium.

These ravenous and cannibalistic predators are naturally scorned, despised and destroyed in valuable salmon and trout waters, and although a most "anti-community" fish, they are nevertheless an interesting change in the coldwater aquarium if only because of their remarkable rate of growth—providing they are adequately fed!

As regards their cannibalistic tendencies, record English pike have been in the angling news this year—one thirty-nine pounder is reported to have been caught by using a twenty-six inch bait of the same species weighing about five pounds. I cannot equal this but I can well believe it, having once helped to land a sixteen-pound pike that took a two-pounder!

Catching the Fry

It is surprising how many anglers and aquarists have never seen a fingerling pike—say under 6 in.—though half-grown and mature pike are easily spotted on sunny days. They spawn in the spring, either early or late according to weather conditions. The implement I have used to capture the fry is an angler's landing net converted to very small mesh by the use of Terylene plain net curtain material.

The secret of capture is not to *trouble* looking for the fry but to sweep the net amongst the weedbeds with a very quick "out and down" motion and a rapid withdrawal to the bank. A warm and sunny mid-day is the best time—then the tiny fry are in the weedy shallows or right at the water's edge where they can gorge themselves on daphnia, gnat larvae and the like. The fry can be found in the shallowest of water—often less than an inch deep. They are easily identified—with their crocodilian features and even slim one-inch specimens are perfect replicas (apart from girth) of mature monsters.

Home Comforts

Although for observation purposes and general appearance of the tank the front should be clear, pike prefer a "mature" tank and they settle down all the sooner if the back and sides are covered with algae for they seem to hate their own reflection and a specimen constantly stracking its own image neither feeds well nor grows much. For a "happy pike" also, rather more than the usual vegetation it is to be preferred, and solitary specimens do better. I gave up trying to keep more than one baby pike in a small tank when my constant journeys for fish-fry as food were discounted by their frequent attacks upon each other. Of course an aquarium containing one specimen cannot be expected to be a "show" like a tank of tropicals, the main purpose being to study the interesting feeding habits of *Esox* and rate of growth. If well fed they will outgrow the swimming space of any normal tank in one year.

The top of the tank should always be kept covered, especially so when the fish is newly introduced, because pike are great jumpers and often take some time to settle down and start feeding well.

Feeding Baby Pike

Daphnia, cyclops, gnat and mosquito larvae and tubifex—almost anything that moves—and a one-inch pike will take them all and grow space. But to keep up the growth, small garden worms, frog tadpoles in season, and especially other fish fry will soon be necessary.

Pike are certainly not everyone's favourite for the aquarium, for they can sustain long periods of complete inactivity when not feeding, but their rate of growth can be fascinating as can their approach to their prey when



June, 1967

they stealthily advance with almost imperceptible forward movement like the finger of a clock, with *neither body nor tail movement* and only a hardly discernible and very rapid "fluttering motion" of the pectorals. At other times they can move faster than the eye can follow; they can also turn head-to-tail with lightning rapidity to snap up their prey.

It is rather surprising also how the prey of pike seem to know when their enemy is fully replete and not "on the hunt". When he is belly-full and immobile, smaller fish will even nuzzle at his motionless tail and he remains quite unmoved as they unconcernedly swim in front of his tooth-filled jaws. Unlike the fox and some other creatures of the wild, *Esox* does not kill for the joy of killing—he kills only when he is hungry. Attacks upon each other are usually in self-defence or "aquatorial" defence.

Ounces into Pounds

I have seen a hungry two-inch pike in my tank consume forty roach fry in less than twenty minutes, followed by numerous small tadpoles until it blew up like a puffer fish and then rested on the tank bottom for several hours. This particular greedy specimen, which I obtained at three-quarter inch length, soon grew too big for the swimming space provided and at a length of five inches it was transferred at a friend's request into his large farm pond which was grossly over-populated with stunted roach and bream. After five years in this predator's paradise it was removed on rod and line and weighed just nine pounds—almost fifty times its weight when introduced!

On the other hand, a friend of mine placed a three-inch pike in his garden pond—three years later this Son of Mother Hubbard found that his baby pike was still a baby of little more than three inches. It was then returned to its natural reservoir home—for a well deserved feed, one hopes.

See how they grow!

by Leon Thorn

HAVE you ever tried to measure the length of individual fish in the aquarium without disturbing them by netting? After many frustrating attempts to check the approximate growth of rapidly developing home-bred goldfish by following them with a ruler along the front of the tank, I found that the procedure could be simplified by the elementary idea of vertically ruling the front section of the tank by means of the quite inexpensive felt-tipped type of marking pen (or is it pencil?).

These pens are obtainable with either broad or fine points and are effective on almost any shiny surface, including glass. It is not necessary to go to the trouble of ruling the whole front of the tank—four or five one-inch columns should be sufficient—unless you have a large tank containing real monsters!

With the tank so marked, it is fairly simple (during those fish-gazing half-hours we all enjoy) to observe the approximate length of specimens as they pause close to the front of the tank when intentionally attracted there by food.

The idea can also be used for watching the growth of plants under various experimental lighting conditions, but when doing this it is only necessary to make small horizontal marks on the glass—to indicate frond tips—and add the date.

When the markings are no longer desired, the glass is easily wiped clean with a damp cloth or sponge.

Photographing fish

by M. H. Colthorpe

FROM time to time I, no doubt like other keen aquarists have wanted to photograph a fish in an aquarium for record or demonstration purposes but have felt it was a rather difficult task which needed specialised apparatus to be successful until last year when I bought a second-hand twinlens reflex camera which came complete with a No. 2 supplementary lens set. When this set is fitted to the lens it alters the near focus by decreasing it from 3.5 feet to 13 inches and being matched for a twinlens camera it corrects the parallax on the viewing lens due to the close approach of the camera to the subject, thereby enabling one to watch the selected fish on the viewing screen all the time whilst the taking lens is stopped down to the appropriate stop for the film and other conditions.

I decided to experiment and for this attempt set about photographing the fish *in situ* in a 4 foot long communal tank rather than move particular specimens into a specially prepared aquarium; one reason for this was that I have found it takes some species a long time to settle down in strange surroundings and this may be said of the Reed-fish which I particularly wanted to record; also it was a lot easier for me to try this on their own home ground so to speak.

The next problem to consider was the type of illumination to be used. Here I think, a "flash" of some sort is essential if one is to catch a moving fish with any degree of success and I was able to borrow a 200 joule electronic flash. Although this flash gun gave a lot of light it had a slow period discharge of around 1/500th of a second which made it impossible to photograph any of the faster moving fish such as "Danios" and another disadvantage was the availability of only one flash head whereas two would have given me a much better type of illumination.

To take the photographs I placed the flash-head over the tank resting it on the glass cover and tilting it slightly to one side so that the light would be sent along the length somewhat and not all directed downwards. I loaded the camera with Ilford HP4, stopped the lens to f22 then placed the camera on a tripod in front of the tank. I quickly found this was a very bad position; firstly because there was a host of reflections from the camera body and lenses, and secondly the tripod did not give sufficient flexibility to enable me to follow the unpredictable movements of the fish. I overcame these troubles by hand holding the camera and keeping it at a sufficient angle to the side of the tank so that reflections were not bouncing straight back into the lens and this has proved fairly satisfactory as the accompanying photographs show.

Opposite—Angel-fish with small Tetradon nearby. The interesting thing about this photograph is that the body of the Angel-fish is lit almost entirely by reflected light and an extra light or reflector somewhere on the side would no doubt have brightened the body.



Above—Reed-fish. The overhead flash illuminates them fairly well being a round shape although the biggest obstacle in obtaining clear shots of these was the muck they kept stirring up as they swam rather vigorously along the floor of the tank, which is perhaps a good reason why a special tank should be set up for photographing fish.



The tiger loach (*Botia hymenophysa*)

by T. Hinitt

THIS attractive and unusual loach makes a very worthwhile addition to any aquarium. Being of a peaceful disposition and pleasant coloration, it will fit in with nearly any other species save for the very smallest tetras and barbs. Belonging to the same family as the well-known but very expensive clown loach. They also hail from the fast flowing streams and rivers of Thailand. Although not quite so magnificently coloured as the clown loach, they are, nevertheless, pleasantly decorated with dark brown stripes on a lighter background. The fins range from a lemon yellow to a very beautiful dark red on the tail and base of the dorsal fin. They are also considerably cheaper than the clown loach. About 15s. is the figure usually asked for a four inch specimen. A fish of this size would be about full grown in the aquarium but in the wild state they are said to reach as much as nine inches.

Like most other species of loach, the botias are of a fairly inactive nature and will often spend the daylight hours in a hollow excavated in the gravel. *Botia hymenophysa*, however, will often spend long hours swimming about the tank with the other fish and only occasionally do they retire to a quiet corner. This activity is more than likely brought about by the fact that, in their native streams, they must be constantly battling against strong currents to prevent themselves from being swept away. In this way they resemble the ever moving danios. In fact, their streamlined body structure points to them being accomplished swimmers well able to hold their own in a powerful current. For this reason it is advisable to supply strong aeration and filtration to make them feel truly at home. When possible several botias should be kept together as it has been known for solitary specimens to become vicious. A small shoal always looks better than a single specimen, no matter what species is kept.

Botias should never be placed in acid water as this is certain to kill them sooner or later. Preferably the water should be of a slightly alkaline nature with plenty of movement and oxygen. This type of water suits the danios admirably and, to my mind, they are the obvious tank mates for the botias. Both species hail from Thailand and no doubt inhabit the same streams.

Feeding these fish is no problem at all as they will avidly take any good dried food. For a treat they can be given garden worms (sized accordingly), daphnia and possibly their favourites, glassworms. These last are eaten very greedily whenever I introduce them into my aquarium. Probably because the loach have no difficulty in taking them into their rather diminutive mouths.

Planting is not necessary in their tank but plenty of hiding places in the form of pieces of wood and stones should be provided as they like to feel that there is a safe hiding place nearby to which they can retire should danger threaten. Lighting should not be too bright as like many other loach they dislike very strong light.

Apart from these few small points they are not very difficult fish to please. Water temperature is not very important and as long as it does not drop below about 70 fahrenheit they will flourish.

So far nobody has succeeded in breeding these loach in the aquarium but I should imagine that with the conditions set out above it would be quite possible to achieve. The only difficulty is in determining the sex of the fish as both males and females are identical. However, even if you do not intend breeding these loach I am sure that you will be very pleased with your acquisition if you finally purchase a number of them.

What is your opinion? No. 2

by B. Whiteside

IN my first article in this series, I posed a couple of questions to readers of *The Aquarist*, and hope that there will be a good response from answering letters. You may know that there is a considerable time between the publication of an article of this type in a monthly magazine and the publication of replies received and comments made on these replies, as magazines are usually planned for going to press a number of weeks before they are actually supplied to the reader.

However, the results received may very well be worth waiting for if they shed any light on the problems which are posed. Remember you may have the answer to a problem which could greatly assist many other keen aquarium keepers; and remember also that facts which you may have gained through failure are equally as important as facts which resulted in success. By eliminating the wrong methods we may be able to end up with the correct solution. We must wait and see what you, the reader, has to say, before we can form any conclusions.

The two problems which I would like your opinions on this time are as follows:—(1) Under which conditions have you managed to grow (or not grow) *Cabomba* and "Ambulia?", and (2) What have been your experiences using different methods of aquarium lighting, including natural sunlight, tungsten bulbs, tungsten strip lighting, fluorescent lighting and Gro-Lux fluorescent tube lighting? Any other forms of lighting which you may have tried would also be of interest to other readers, so let's have your opinion on any of the above points.

I myself have just installed a Gro-Lux tube over one tank and await my own results with great interest. I hope to be able to publish my findings in a later issue of *The Aquarist*.

Coldwater fish-keeping answered by A. Boarder

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

Plases could you tell me where I can obtain a good selection of fancy goldfish, such as Lionheads, Orandas, Celestials and the like?

I am sorry but at the moment I am unable to tell you where you can get such fishes. Almost 20 years ago I would have been able to assist you as there were some very fine specimens of fancy goldfish at the various shows for several years after the last war. However for some reason their numbers have decreased until it is very rare to see more than one or two good specimens at shows in recent years. There were breeders who specialised in one particular variety and bred some fine prize winning fish. All I can suggest is that you watch the advertisements in *The Aquarist*, or put in a small one yourself.

Could I use stainless steel or aluminium sheets for the base of an aquarium, if so would they be harmful to fish?

I do not see why it should not be possible to use these metals as long as they are stout enough. If the tanks are large the weight of water could bend the sheets if thin and this could cause a leak. I do not think they would be harmful to fish, but they could always be painted with a good enamel.

I have read that the urine from goldfish turns the water yellow and foul and that a filter will not get rid of this. What is your comment on this please?

Goldfish do not pass urine but droppings only. Filters can get rid of most of this but if too much is taken from the tank the water plants cannot get enough nourishment which they would normally get from the droppings from the fishes. Any tank can be kept clear and in good condition as long as there are enough healthy growing plants, not too many fishes and they are not over-fed. This can be done without an aerator or filter.

Can you give me advice on a coating for a concrete pond which has become badly cracked?

Cracks can be filled with a quick drying cement such as Prosept or to make certain that it will not leak again you could line it with a sheet of the heavy P.V.C. sheeting or a similar make. The sheet could stretch over the edges of the pond and be secured by pieces of paving stones or concrete slabs. Before lining the pond you would have to make sure that there were no sharp edges or deep cracks which could cause the lining to be punctured.

Can you give me any reason why my snails in the garden pond have not appeared this year? I have a flourishing pond with about 80 assorted fishes. I had 20 snails last year but so far none has appeared.

If you have any tench among your stock it is probable that they have eaten the snails. Most fishes will eat water snails soon after they hatch from the eggs but it takes a fish like a tench to suck out the fully grown ones from their shells. Coldwater catfish would also eat snails.

I have a frog in my pond will it harm the goldfish?

A male frog could clasp a goldfish if there was no female frog available in the pond. I have only had this happen on two occasions during the past thirty years and have many frogs breeding in my pond every year. Any fish attacked

and held is usually one heavy in spawn and so very sluggish. If found in time the frog can be removed from the fish and all can be well, but a frog could kill a fish if it clasped it so long as to interfere with its breathing.

My pond, 12 by 10 yards became covered with duck weed last year. I have been told that if I put a few hundred great pond snails in the pond they would eat the duck weed. Do you think this would be so?

I am doubtful if the snails would do the trick. I would suggest that the same number of goldfish or half the number would probably clear the weed much better. Goldfish are very fond of this weed and as long as they are not given any other food they would soon eat most of it. I like a fair covering of duck weed on my pond during the spring as it tends to keep the green algae from forming. It is easily removed by playing a hose on it from one side when it can be rolled over to the far edge and removed by rake. If this is done occasionally during the summer you will be able to keep it under control.

I have kept and bred a number of goldfish in my pond for some years. Lately they have started dying off one or two at a time. They become very sluggish before dying but show no signs of fungus or disease when examined. Why is this?

It appears that the water in your pond has become foul. When fishes die without showing any outward sign of disease it is usually because of the presence of too many foul gases in the water. This of course means that there is a lack of oxygen. I suggest that the pond should be cleaned out and refilled and this should be done at the beginning of the winter to make sure that the water is in good condition for the winter.

I have a lamp over my tank and since using it the water plants have turned brown. Why is this?

The lamp should encourage the growth of the water plants as long as they have some nourishment under them. Many aquarists set up a tank with no loam at the back for the plants. A little under the gravel helps the plants to grow before there is sufficient nourishment from the droppings of the fish.

I wanted to breed bitterling carp and as I know they lay their eggs in fresh water mussels I bought two but they went bad and opened up. What can I do?

You will never keep freshwater mussels alive unless the tank has a good covering of mud or muck at the bottom in which they can work and move about. They would soon die if the right conditions were not present, and an inch at least of muck would be necessary to keep them alive.

Two members of our Club have had attacks of white spot disease among their fish. They wonder if this was introduced from the tap water which comes from a reservoir containing Rudd and Perch. The tanks were topped up after the water had been boiled. How do you think the disease was introduced?

I do not think the white spot was started through the tap water. This is chlorinated to kill anything harmful in it. The young parasites of white spot disease are free swimming and have to find a host very soon after being hatched from the cyst. They soon die if they cannot attach themselves to a fish and so it is extremely unlikely that this trouble was brought on by tap water. It is much more likely to have been introduced with live foods collected from natural waters, such as Daphnia and Tubifex.

Could you tell me how many fish I should have in a tank 12 x 8 inches please?

Your tank will hold five inches of fish not including the tail. Any attempt to keep more than this will almost surely bring trouble.

Our experts' answers to tropical fish-keeping

I have the opportunity of buying some young all-black sharks (*Alopias chrysolepis*). Would two or three of these be suitable for introduction into a 48 in. by 12 in. by 12 in. tank already stocked with small barbs and tetras?

The all-black shark is a first-class inmate for a large community tank. It will not grow embarrassingly fast if the tank it inhabits is well stocked with other fishes. It eats anything and is as good as gold.

As a newcomer to the tropical fishkeeping hobby I would be grateful for some information regarding the following. My fishes in their newly set up aquarium keep flicking their bodies and fins against the plants and sides of the aquarium. A tropical fishkeeping friend has told me that this behaviour is a sign that the fish have contracted whitespot disease. Is this true?

Not necessarily. Water fresh from a tap sometimes makes fish behave in this way. But as the water ages the trouble clears up. It is believed, you see, that new water sets up a temporary irritation in the skin of certain fishes. But keep a sharp look-out for white spots on the bodies and fins of the fish. If you notice any white spots, raise the temperature of the water to about 80°F (27°C) and add drops of a 5 per cent. solution of methylene blue to the water to colour it a pale blue. Add more drops as the colour fades. Prompt treatment along these lines should result in the fish losing their signs of disease within a fortnight or so.

I spawned my rosy barbs in a 24 in. by 12 in. by 12 in. tank and within a few days I had what appeared to be hundreds of fry. I introduced a fine grade of dried food and, a few days later, lots of tiny Daphnia, but after a fortnight only a few of the tiny barbs were left alive. What, in your opinion, killed off the rest?

In all probability your barb fry died of starvation. Most newly-hatched barb fry have very small mouths and need plenty of really microscopic food to grow them on to a stage when they can take daphnia. Fine dried food usually swells appreciably after contact with water. Next time you spawn your rosy barbs feed the fry on freshly-cultured Infusoria and green water for the first nine days. Then, and only then, offer them larger food.

Could I keep some African clawed Toads (*Xenopus*) in my tropical aquarium?

You could keep small clawed toads in your tropical aquarium but when they increased in size they would prove dangerous companions for your fishes. Clawed toads have large mouths and appetites to match.



Xenopus



Therapon jarbat

Can *Therapon jarbat* be kept for any length of time in fresh water?

T. jarbat, like the Malayan angel fish and some of the scats, can be acclimatised to life in fresh water. All the same, the species lives longest and healthiest in an aquarium in which a small quantity of sea salt has been added.

One of our club members told me that there is more than one species of White Cloud Mountain minnow known to science. Is this true?

The short answer is yes. *Tanichthys albonota* is the true White Cloud Mountain minnow. It is indigenous to a limited area around Cannon, China. This fish, however, is easily confused with *Aphyocypris pooni*, a similar-looking little species from roughly the same area (and beyond) of China. The colours of these fish aid identification: for whereas the fins of *T. albonota* are yellow in the base and bright red in the outer margins, those of *A. pooni* are red in the base, with blue margins. Also, *A. pooni* has a yellowish tinge over the body. As *T. albonota* and *A. pooni* have interbred in captivity (and not unlikely in the wild too) it is not easy to come across a pure strain of *A. pooni* in aquarists' tanks at the present time.

Can you give me some helpful advice on the breeding of bloodlines (*Aphyocypris rubripinnis*)?

Basic requirements are clear water, preferably soft and on the acid side, plenty of fuzzy-foliaged plant life to trap the scattered adhesive eggs, and a temperature in the neighbourhood of 78°F (26°C). The sexes should be separated for a while before being placed in the tank set aside for spawning. After the spawning drives are over the fish must be removed from the tank without delay or else they will feast on their spawn. The eggs hatch out in a day or two, and a day or two later the glassy fry need the smallest live or artificial food obtainable.

Working on my allotment I occasionally turn up lots of earth-worms. Can you suggest any way I could store these worms in healthy condition for use during the lean months of the year?

What you need is an old wash-tub or deep sink, with a hole in the bottom to prevent water logging, sunk in the ground. It is really immaterial whether this is sunk in full sun or shade. Cover the bottom to a depth of about four inches with weathered ashes or small clinkers or twiggly hedge trimmings. Then, before you introduce any worms, throw in potato peelings, torn wet newspaper, chopped cabbage stalks, lawn mowings and the like. Cover with a few spadefuls of soil. Now add the worms. Every so often throw in more vegetable refuse, some manure of any sort if you can procure it, and a little more soil. Cover the surface of the container with a sheet of linoleum, or something to keep out frost, before the onset of frosty weather.

Marine queries answered by T. Ravensdale

I recently bought a "pair" of sea horses but am unable to sex them. Can you help?

Sea horses are very easy to sex as the female has an ovipositor. Sea horses however seldom mate in the aquarium but are more liable to arrive pregnant from the wild. Good feeding with live fish is essential as most aquarium sea horses die of malnutrition. They require plenty of places to hang their tails onto and good clean water around the 1.025 mark. It should be remembered however that sea horses usually breed only between February and September and a hatching usually results in about 24 young. Incubation is around 14 days.

Can a lion fish be kept in a community tank?

Lion fish is a name given to many fish from the Scorpionidae family but I feel sure you are referring to the *Pterois volitans* and the answer is, provisionally, yes. The scorpion is not a vicious fish which rushes around stinging everything in sight. He rarely makes use of his highly dangerous poison and kills his prey by swallowing it whole. He can and will differentiate between food and fellows and will steer clear of any fish his own size. The *Pterois volitans* can however reach a length exceeding 18 in. but, due to its preference for an idle life, it will live quite happily in "cramped conditions".

Most books state that metals should be kept out of the marine aquarium. Is this because they will wear out quickly?

Not entirely. It is not the metal damage which is our prime concern but pollution of the water. A change of trace elements in the water will upset the balance so carefully calculated by the chemists whether it be caused by chemicals or metal particles. If you must use a metal then choose lead. This metal, strangely enough, seems not to harm the water provided it is pure lead.

I have six marine tanks and am having trouble getting a pump powerful enough to cope with all the air I need. Can I make use of an oxygen cylinder?

Most certainly use an oxygen cylinder but take great care that only large air bubbles are allowed to enter the water. Should you be using fine air stones, change them, for minute oxygen bubbles can kill a fish.

Continued from page 57

The midshipman

vibrating its swim bladder; some people call it humming or even singing, others say the fish grunts. Personally, I call it growling since that word is about as accurately descriptive as any of the others and it better indicates the real purpose of the sound. Using it habitually, though, could cause one to acquire a reputation for indulging in flights of fancy as when my wife, entertaining guests, suddenly turned to me and asked: "What are those fish that you find growling under the rocks?"

Literature cited: Clemens and Wilby, "Fishes of the Pacific Coast of Canada" 1946. Published by the Fisheries Research Board of Canada.

Corydoras myersi

by J. Hems

THIS catfish is native to the upper reaches of the Amazon, beyond Manaus, and was first introduced to tropical aquarists about twenty-five years ago. Apart from its attractive appearance, its peaceful nature and its longevity (given well-aerated water and the right sort and quantity of food it will stay alive for more than five years), it is as easy to care for and as tireless a scavenger as any of its non-faddy congeners.

The anterior part of the bony-plated body is reddish tan. Towards the tail this colour tones down to a somewhat diaphanous brownish yellow. A wide bluish black to brownish horizontal stripe, that has its origin on the nape and terminates at the base of the forked caudal fin, adorns the upper sides. It is paralleled with a shadowy horizontal marking on the middle to lower part of the sides. The ivory underparts and the tan, shot with green and gold, gill-covers are flushed with red. The beady black eyes are rimmed with metallic green, or greeny blue. The fins are grey to brown. Young (small) fish are much brighter coloured (orange red anteriorly and yellowish green posteriorly) than old fish. At about 2½ ins. the fish is fully grown.

C. myersi, named after Dr. George Sprague Myers, the distinguished American ichthyologist, can stand a temperature down to about 68°F (20°C) for short periods of time with no ill-effects. Be this as it may, it flourishes best at a temperature of about 72°F (22°C) to 75°F (24°C). It is retiring by nature (but then few catfishes are anything but not retiring) and seems most at home in a thickly planted tank.

Like other bottom-dwelling scavengers, this catfish alternates its irregular but quite frequent periods of slumber (or what appears to be slumber, or meditation) with sudden bursts of activity, raking and turning over the compost in search of food. In a community tank it will soon grow lean and unhealthily lethargic unless the tiny quantity of edible matter it uncovers is supplemented with such things as finely shredded cooked or raw red meat, or chopped earthworms. Tiny crustaceans such as *Daphnia* and young freshwater shrimps are relished. As will be readily realised, these items of diet should be introduced into a community aquarium at dusk, when Myers' catfish becomes increasingly active and the other fishes have settled, or are settling, down for the night.

The fish will breed in captivity, but not freely. That is to say not with the freedom that in-spawn bronze catfish (*C. aeneus*) or peppered catfish (*C. paleatus*) will breed if conditions are right: clean, neutral to slightly alkaline water (not old water) and a temperature that fluctuates over so gradually between the middle sixties and the middle seventies (°F).

Sexing *Corydoras* catfish is rather a hit or miss affair, but in well-grown specimens the ones that are fuller-bodied anteriorly and larger all round than their companions (if several of the same species are viewed at the same time in a tank) are invariably females. A really marked fullness of the abdomen, which may or may not be coloured bright pink, usually denotes the presence of roe or spawn.

The Pipe Fish

by "Marstud"

MEMBERS of the family Syngnathidae, more commonly known as Pipe Fish, can be found throughout the world both in brackish and marine waters. Coldwater species can be found around the British coast and there are seven species that have been recorded as being quite common. We shall deal with these coldwater species first.

Native species:—

- Syngnathus acus*, the Great Pipe fish.
- Syphonotoma typhle*, Broad-nosed Pipe fish.
- Entelurus aequoreus*, the Snake, or Ocean Pipe fish.
- Nerophis lumbiciformis*, Worm Pipe fish.
- Nerophis ophidium*, Straight-nosed Pipe fish.
- Syngnathus rostellatus*.

The first two species are quite common, the latter quite rare.

The Great Pipe fish grows to about eighteen inches whereas the Broad-nosed Pipe fish will only reach about thirteen inches. Spawning of all species takes place in early spring and although the fry seem to be entirely independent of their parents they will retreat to the brood pouch of the male at the slightest hint of danger. They have an unusual way of swimming; sometimes they are perpendicular with either the head or tail uppermost; sometimes horizontal. Progress generally is slow and the fish only just manages to maintain its position in the water, but a completely different writhing motion is used when rapid movement is required. The Pipe fishes, not only in their shape and colour but also in their slowly swaying action, bear a marked resemblance to the fronds of seaweed among which they live. Pipe fishes live almost entirely on small crustaceans and when searching for food they swim about slowly in a most curious manner, the head in constant movement, the long snout being poked into clumps of vegetation or into any other situation where the prey is likely to be encountered. The actual manner of feeding is remarkable, the tube-like 'beak' acting as a kind of syringe, the prey being drawn in rapidly by inflating the cheeks. The close relatives of the Pipe fishes, the Hippocampids (Sea-horses) act in a like manner. Gill structure is different in the Syngnathiformes, sometimes spoken of as Lophobranchs (tuft gills), the filaments are reduced to small rosette-like tufts attached to quite rudimentary arches.

Pipe fish in aquaria, whether tropical or native coldwater, thrive on a diet of live brine shrimp (*Artemia salina*) but if this cannot be given daphnia may be substituted. In my experience they will accept no other foods. Tetramarin, tubifex, frozen and dried brine shrimp, all were tried without success on either the tropical or native species. In the wild their food consists of tiny crustaceans only and it seems that as they are specially adapted to eat this food they will take no other. If, however, the feeding problem can be overcome they make lively and unusual additions to the aquarium and unlike sea-horses may be kept in a



The Great Pipe-Fish (*Syngnathus acus*) and the head of a Broad-nosed Pipe-Fish (*Syphonotoma T.*)

community set-up with other species. Clown fish even seem to take hardly any notice of these oddly shaped 'tufts of seaweed'.

A list of tropical species would not be practicable here as there are so many, but they all require the same conditions and are of the same feeding habits and generic family, Syngnathidae.

Classification of Pipe fishes: Isospondyli. Order Solenichthyes, Family Syngnathidae, Genus *Syngnathus*, *Nerophis*, *Entelurus*, *Syphonotoma* (*Syphonotoma*) etc. (Solenichthyes - Tube mouth).

Continued from page 59

Fancy goldfish—the Moor

Under the 1947 standards, the pointings were: Eyes, 20; body, 20-18; dorsal, 8-7; caudal, 20-18; pectorals, 2-2; pelvics, 2-2; anals, 4-4; colour, 10-15; condition, 4-4; deportment, 10-10. The double figures represent the pointings for scaled fish and calico, the first number quoted being for the scaled fish. These pointings were all to cover the following varieties: Telescopic eyed scaled fantail; telescopic eyed calico fantail; fantail moor; telescopic eyed scaled veiltail; telescopic eyed calico veiltail and veiltail moor.

It will be seen from this that there were no separate pointings for the moors alone and in this I consider that not enough points are available for colour, one of the most important features of this fish which differentiates it from other varieties. Where such differences exist I consider that more points should be available for such features. I would suggest the following pointings: Eyes, 10; body, 20; dorsal, 8; caudal, 14; pectorals and pelvic, 4; anals, 4; colour, 30; condition, 10.

The above points could be allotted for either the fantail or the veiltail moor, and as can be noted there are points for eyes and extra for the colour, the two characteristics peculiar to the variety.

Hong Kong finds gold in a fish tank

Hong Kong-bred tropical fish have caught the fancy of world aquarium hobbyists from Europe to Alaska. And it is bringing millions of dollars into the Colony each year.

The Chinese, traditionally, have been fish-keepers for thousands of years and in Hong Kong domestic sales have gone on steadily for decades. But in recent years—especially with the advent of jet air freight services—Hong Kong's exotic fish have hit the world market. The colony now sells them to more than 20 countries, with America firmly at the top of the buyers' list.

Last year fish worth about four million dollars (£250,000 Sterling; US\$700,000) were sold abroad and this year's exports will probably be even higher.



There is a roaring domestic trade in tropical fish in Hong Kong. Some are sold, like this, in the simplest of street stalls. Others are sold from opulent aquarist shops.



They call these beautiful fish Kissing Gourami because they put their lips to almost anything in sight. They sell for up to HK\$30 (6s. Sterling; US70c to £1 17s. 6d. Sterling; US\$4.95) a pair.



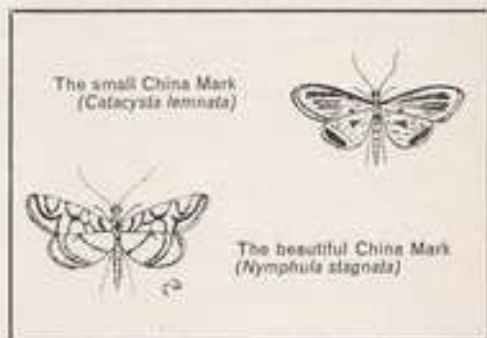
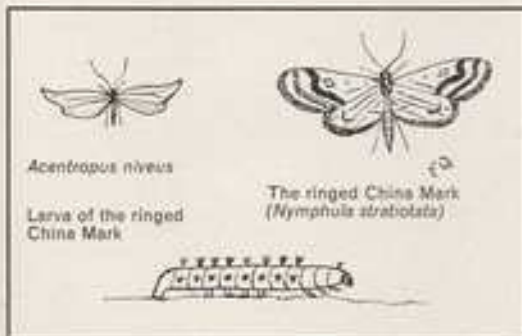
Boxes of tropical fish being loaded aboard a jet plane. The fish are in water filled plastic bags inside the boxes.

The China Mark moths

by P. Wilmot

THE five species of aquatic moths found in Britain are popularly known as "China Marks", because of the resemblance of the delicate pattern on the wings of some of them to the markings on fine china. The extraordinary thing about them, however, is that they have returned to the original home of all living things—the water—after completely adapting themselves to existence on land. In so doing they have obeyed nature's law that all life must succeed in re-adapting itself to changing conditions or perish.

Because of the structure of the minute scales covering their wings, the moths are capable of running along the stems of plants beneath the surface of the water without causing any damage to the wings. In the case of one species the female, which has only rudimentary wings,



it that air can flow in through the entrance which the caterpillar blocks if necessary with the front part of its body. It then breathes the air in the usual way through its spiracles. When the time comes for it to pupate, the caterpillar constructs a silken cocoon which is usually completely submerged but sometimes only partially so.

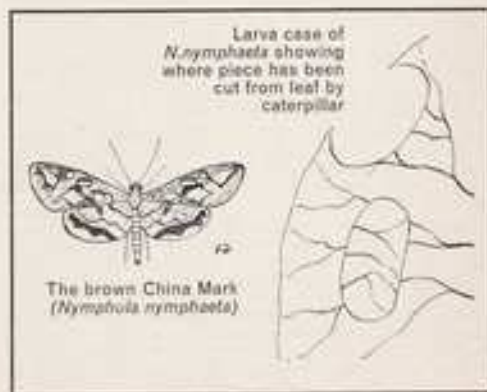
The small china mark (*Cataclysta lemnata*), is probably the commonest of the five species. It is a pretty little moth and, like the beautiful china mark, may frequently be seen flying amongst aquatic plants on fine summer evenings. Its caterpillar constructs a protective floating case by spinning together fronds of duckweed, on which it feeds. It will also occasionally utilize a piece of hollow stem which

Continued on page 72

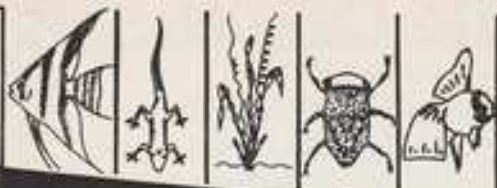
lives and swims under water.

It is probably the caterpillars of these species, however, which have achieved the greatest alterations in their way of life for they have adapted themselves to living below the surface of the water in protective cases whilst still retaining all the physical equipment of ordinary land caterpillars. This includes the spiracles or air-breathing tubes, the visible entrances of which are ranged along the sides of caterpillars like portholes.

One of the commonest of the species of aquatic moths is the beautiful china mark (*Nymphula stagnata*), which may frequently be seen flying on a fine summer's evening amongst the plants on the margins of ponds and lakes. It is, as its name implies, the most attractive of the aquatic moths. The caterpillar of this species constructs a water-tight protective case by spinning together the leaves of the bur-reed, which is one of the plants on which it feeds. It builds the case at the surface of the water and so contrives



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

Tank Stocking

JOHN GRAHAM in his article "Stocking Your Community Tank" (*The Aquarist*, January 1966) presented a very well thought out rule that stated: The water/air surface required for a fish (in square inches) is four times the square of the length of the fish (in inches). This gives a reasonable safety margin for fishes up to four inches in length.

Since this article was published, I have seen articles and answers to queries which give rules for the stocking of fish as so many inches of fish for so many square inches of water/air surface, or else so many inches of fish per gallon of water. I wonder if these writers bother to read the rest of the magazine that prints their views, or else why don't they write to "Our Readers Write" and disagree with Mr. Graham's article.

However, any rule can only hold true if the surface of the water is kept clear of oily scum. When I lived in the suburbs of London, I had to skim the scum off once every day, but since moving to the Isle of Wight, I have been skimming off traces of oil once a fortnight. I am glad that I did move—for my fishes' and my family's sake.

Yours faithfully,
J. D. SOLLS,
Northwood,
Coves, I.O.W.

Know your Judge

Fundulus Grandis or *Fundulus heteroclitus*? Pay the show fee and the judge takes his pick, at least if the judge is either Mr. C. A. T. Brown or Mr. D. W. Ellis he will. I think their letters in *The Aquarist*, March, 1967, prove my point on this.

The other point I made in my letter was that the result list marked by the judge showed the fish to be *F. chrysopterus* and I and several others assumed it had been judged as such. If Mr. Brown knew the fish was *F. heteroclitus*, as he says now, why didn't he amend the list to show its correct designation? If this had been done at the time this correspondence would never have been written. One can disagree with a judge; after all he has his opinion and I have mine, but the fish should have been correctly judged as *F. heteroclitus* and I believe it was not.

Regarding my qualification for assuming that *F. heteroclitus* grows to six inches the reference is "The Handbook of Tropical Aquarium Fishes" page 434 by Axelrod and Shultz published in 1952. The fish was also mentioned in *The Aquarist* in that year.

The remark about consistent judging is completely invalid. Mr. Ellis' own fish a *F. grandis*? had won a major award at the B.K.A. International Show at The Bingley Hall in Birmingham, and there were several other award winners on show that day.

Cheap publicity for the B.K.A.? I must say that since its formation nearly two years ago the B.K.A., in the person of our technical editor Ted Seymour, has done more for the correct naming of killifish than any other organisation, before or since.

In conclusion my thanks to Mr. Jessop. His letter will I am sure be of great assistance to me and many other aquarists who, whilst believing the dictum "the judges decision is final" like to register our protest when the occasion arises.

Yours faithfully,
JOHN OVEN,
214 Peckham Rye,
London, S.E.22.

From over the Ditch

I HAVE written to some of your advertisers for information and it amazes me that the cost of this particular hobby is greater in the U.K. than it is here. I am not referring to fish alone but to equipment generally.

Where I am living is roughly mid-way between Sydney and Melbourne, with Canberra almost 150 miles away, towards Sydney, it can be said that I am 350 miles from each of the State capitals. I am also less than 100 miles from the Murrumbidgee Irrigation Area whose water channels teem with fish fry and larger, I have been granted a favour which allows me to take fry from the channels, this may interest some of your readers. It is possible to get an export licence to ship this species of fish to hobbyists on your side of the ditch, would anyone be interested in the Australian rainbow, gudgeons, etc? We have about 28 varieties of fish here in our Murrumbidgee river. Last

Saturday I went 25 miles to a lagoon off the river proper and managed to get about 30 small rainbow from 1 in. to 1½ in. plus a few gudgeon. These fish are NOT tropicals in the truest sense; they have a temperature tolerance of from 40°F to over 90°F, and in this part of the State we do get long periods of over the 100 mark.

Tropical fish has been a hobby with me for over 30 years off and on, and the breeding of them is my present ambition. I shall in the very near future have a fish room to hold about 70—3 ft. tanks plus a lot of smaller tanks, and one species of fish I shall then be most interested in will be the tooth carp or the killifish, of which very few appear to arrive here in this country—hence I shall be after contacts on your side.

Of my background: I am a retired grazier. Retirement is a damn silly caper to get up to, nevertheless here I am without a property (farm to you) and being an old Digger I can still find plenty of mischief, so back to fish. I also know quite a lot of your Island, having made several visits, two at the expense of His Majesty (now don't get that wrong, 'twas during the 1914/18 and the 1939/45 display of the Hun).

Awaiting the arrival of more journals from you and with regards.

Yours faithfully,
W. G. CAHNS,
Coolamon,
Australia, N.S.W.

Mr. Boarder replies

I WAS very pleased to read the letter from Mr. R. S. Holmes, criticizing my articles on goldfish. It is a pity, though, that he let such a sour note creep into his penultimate paragraph, in which he makes a strong inference that I am not a good judge. Now this is libellous and actionable. However, perhaps fortunately, I have a fairly thick skin developed during twenty-six years service in the Metropolitan Police, and even after twenty-one years of retirement still have the capacity to ignore cheap sneers.

It is not for me to say whether I am a good judge or not, but during my seventeen years as a Federation judge of coldwater classes I have been invited to judge at very many of the leading shows in the country.

As for stating my opinions, I am just as entitled to express mine as Mr. Holmes has done in a big way. I may have my preferences but this has never prevented me from giving impartial opinions when judging. I do not agree with the Nymph but when judging such fish I have always abided by the standards. I also never agreed with the 20 points for size, but always considered this when such pointings were allowed in the standards.

With regard to my statement about scaled veiltails. The standards call for...caudal fin 'falling into graceful folds, like drapery'. Now I have yet to see a scaled fish which has a caudal so soft that it falls in graceful folds. As for breeding fantails from veiltails, if he or anyone else cares to show me a dozen fantails among which are some bred directly from a good strain of veiltails, I will pick them out as quickly as it takes me to walk from one end of the row of tanks to the other.

I have seen many so-called fantails which have shown immediately to me that they were throw-outs from veiltails. The sure signs are the over-developed and rounded dorsal fin and the large, rounded almost forkless caudal fin. An over-developed calico fantail could be included in a veiltail class, and so if veiltails were to be all calico and all fantails scaled there would not arise the possibility of a throw-out from one type competing in a wrong class.

I included my idea of a good pointing system to help the many readers who have written to me on the subject. Among the many hundreds of letters I have dealt with over the past twenty years many have specifically asked about standards for judging fancy goldfish. I put forward my pointings as a mere suggestion and do not expect that they will have to be considered by the Federation or anyone else for that matter. After many years of judging fancy goldfish I consider that my suggestions would help to improve the quality of the fishes and make it easier for the judge to reward those specific features which differentiate one variety from another. When judging finnage I point for size and shape and if a fish has a nick in a fin I do not down point it under finnage but under condition.

Yours faithfully,
A. BOARDER,
Ruislip, Middlesex.

Aquarium Magazines in America

IN the "Our expert's answers to tropical fish-keeping" column of the April issue, the information was proffered that "...at least two aquarium magazines were in circulation in the U.S.A. before 1914. One of these, *Aquatic Life and the Aquatic World*, is still in print".

The chronology of American aquarium magazines prior to World War I is as follows:

The New York Aquarium Journal: October 1876—May 1877.

The Aquarium: 1877—1887; October 1892—April 1897.

Brooklyn Aquarium Society Bulletin: May 1911—February 1912.

The Aquarium: April 1912—February 1914.

The first *The Aquarium* listed was published by Hugo Mulert, "Father of the Aquarium Hobby in America". Although the exact dates of publication for its first two volumes are unknown, there is reference extant to an issue of January 1880. In point of fact, *The New York Aquarium Journal* and Mulert's *The Aquarium* were the first two aquarium magazines published anywhere in the world; the Germans published the third.

The second *The Aquarium* was published by a joint council of the then New York, Philadelphia, Brooklyn and Chicago aquarium societies. Neither, of course, bore any relationship to the magazine of the same name published by William T. Innes, started in May 1932.

Regarding *Aquatic Life and the Aquatic World*, the publication appeared first in September 1915, under the title *Aquatic Life*. In October 1917, the short-lived periodical, *Aquatic World*, made its debut (it lasted but three issues). With Vol. VI, No. 6, dated "July—October 1922", *Aquatic Life* was purchased by the former editor of *Aquatic World* and in the issue dated November 1922, first appeared under the full title, *Aquatic Life and the Aquatic World*. It might be mentioned that the *Brooklyn Aquarium Society Bulletin* appeared once again, in August 1915, to disappear forever in August 1919.

As historian for the American aquarium hobby and consequently, as one who particularly appreciates these matters, might I remark in passing that British aquarists must surely take considerable pride in the fact that Great Britain was the birthplace of the aquarium hobby in the world. It seems appropriate here that this all-too-often overlooked debt of heritage be acknowledged once again.

Yours faithfully,
ALBERT J. KLEE,
Editor, *Aquarium Illustrated*.

The China Mark moths

It has found floating on the water. During the first part of its existence the caterpillar lives in actual contact with the water, and presumably breathes through its skin as it has no gills. To prevent it drowning its spiracles are closed during this period. Later, however, the spiracles become functional and the caterpillar then breathes the air at the surface of the water or that enclosed within the watertight case which it constructs. It has been found that if driven from its case the caterpillar constructs another, seldom taking more than 15 minutes to do so. It pupates in a silken cocoon just below the surface of the water.

The brown china mark (*Nymphula cyphastata*) is quite common but it is not so attractive in appearance as the two preceding species. It also can be seen flying during the summer months around the margins of ponds. The caterpillar lives in its case in actual contact with the water during the first part of its life in the same way as the caterpillar of the small china mark. It also, presumably, breathes through its skin as it has no gills. Later its spiracles become functional and it constructs a case which is water-tight, using the leaves of pondweed and water-lilies for this purpose. It has been variously stated that the caterpillar of this species pupates in a silken cocoon attached to a plant just above water-level, also that it pupates below water-level.

Acentropus niveus is less common than the three preceding species and has no popular name. It is, however, a most remarkable moth because it has two kinds of female. One kind has only rudimentary wings and remains under water, swimming with its legs. The other kind, which is fully winged, remains above water. The caterpillar lives under water in a protective case which it forms by spinning together the leaves of its food plants. It has been stated both that it is in actual contact with the water until it pupates, breathing through its skin—and also that it breathes air through its spiracles. The caterpillar pupates under water in a silken cocoon fixed to a water-plant.

Nymphula stratiotata is rather uncommon in Britain and is sometimes known as the ringed china mark. The caterpillar has a number of tuft-like gills spread over its body-surface and its spiracles are always closed. In common with all the other species it forms a protective case around itself by binding together the leaves of its food plants. The case is always full of water and it breathes through its gills. The caterpillar pupates in a submerged cocoon, but this is filled with air and the pupa breathes through its spiracles, which have now become functional.

When the various stages in development reached by the five species of moths are considered one cannot help feeling that some of the species, at least, are still engaged—before our eyes, so to speak—in adapting themselves more completely to life in the water.

'CHAMPION OF CHAMPIONS' contest

FOR THE FIRST TIME IN THE HISTORY OF FISHKEEPING in this country a competition is to be held to decide the Champion fish of the shows, and this will be promoted by the *Aquarist and Pondkeeper*. The entries will come from the winners of the 'Best Fish in the Show' awards which are included in the open shows now being held, and they will be automatically eligible to enter for the 'Champion of Champions' contest which will be held in conjunction with the **British Aquarists' Festival at Belle Vue, Manchester on the 18th-19th October**. The cash prizes and other awards for this contest are described on the opposite page.

This competition is the natural development of the 'Best Fish in the Show' awards, previous information regarding which has been published in the last two issues of the *Aquarist and Pondkeeper*.

A form which is required for completion in connection with the 'Best Fish in the Show' award will be sent to secretaries and the pins will be sent for presentation at the show as soon as these are available. Where a show has been held the form will be sent to the secretary for completion and return to the *Aquarist and Pondkeeper*, when the pin will be sent direct to the winner from this office. The names of all the winners for the 'Best Fish in the Show' and who are eligible for entering the 'Champion of Champions' contest will be announced monthly.

On the success of this contest, which is the first of its kind, will determine what alterations, if any, are necessary to be made in the future. The object is to encourage the breeding and exhibiting of good class fish, and it is in this connection that full support from the clubs is essential.

Any secretary who has not received a form should contact, The Aquarist (Contest), The Butts, Half Acre, Brentford, Middlesex.



Award to winner at OPEN SHOWS

A gold-plated pin will be awarded to the winner of the 'Best Fish in the Show' award included in the open shows. The pin, in the shape of *The Aquarist* badge, is inscribed—'Best Fish in the Show' as illustrated.



Award to winner of THE CHAMPION OF CHAMPIONS CONTEST

The winner of the 'Champion of Champions' contest will be awarded a Hall-marked 9ct gold lapel pin in the shape of *The Aquarist* badge inscribed—'Champion of Champions'. Laurels support this badge to differentiate between the 'Champion of Champions' and the 'Best Fish in the Show' awards. A cash prize of twenty guineas together with an inscribed plaque will also be awarded.

An oxidised silver-plated plaque, mounted on a hand-made Indian Rosewood back, will be awarded to the winner of the 'Champion of Champions' contest, together with a solid gold pin as described above. A similar plaque will also be awarded to the second and third successful contestants together with a cash prize of thirteen guineas and seven guineas respectively. The plaques are inscribed with the names of the recipients and the position gained in the contest.



Going marine Part 5—Diseases

by T. Ravensdale, F.B.I.S., F.M.S.S., A.M.Z.S.

CONSIDERING the fact that most marine aquarists have at some time or other experienced disease in the aquarium and that they have all had plenty of opportunity to study sick fish (there are plenty of sick specimens to study), it is remarkable how little we all know about diseases. Diseases in the marine aquarium are as common as guppies and yet we are still unable to even identify most ailments let alone treat or cure them. I can therefore only write about diseases which I have personally come upon and treated either successfully or not. This list is consequently by no means complete; you must add your experiences to mine and perhaps between us we can effect a cure or two. Should you come upon other diseases or cures please write and tell us

Quarantine

Every single intended addition to your community aquarium, whether a fish, invertebrate (anemones are notorious disease carriers) or plant, must be subjected to a strict quarantine period before passing into the tank with established specimens. The period they spend in quarantine is the most important one of their lives and your job is to establish their fitness in the quarantine tank before allowing a move. This tank can also serve as a density change aquarium and a food requirement experimental station. Daily examinations should take place and all experiments noted for future reference. Most maladies will show themselves during a two-week period and the state of the dorsal fin will indicate possible unhappiness. It is a curious fact that the dorsal fin plays a great part in the life of a salt-water fish. The freshwater fish will fold his dorsal fin when unwell but this does not happen in the marine aquarium. The marine fish makes much more use of this and uses it for many things such as a weapon or "anti catch" device as in the trigger fish; it is even used as disguise. The dorsal fin pops up and down all the time according to the fish's mood but a permanently upright dorsal fin usually indicates an unhappy state.

Disinfectants such as Diseaseolve, methylene blue or pot. permanganate can be used in the quarantine tank and no fish should ever leave it until you are quite sure of its food requirements, disposition and health. The tank should also be left in a quiet corner with very little lighting or disturbance.

Shock

This is the usual killer of many marine fish whether directly or not. The will to live in a marine fish is strong but when the frightening trip from sea to aquarium is over shock usually strikes. One never suffers shock during an accident, it is only when the excitement of the action stops that the effects of what has happened hits one and delayed shock can be more dangerous than a disease. We cannot avoid the state of shock before the fish reaches our hands but we can ensure it is lessened and a period

allowed for it to pass. You must therefore handle your new specimen with the utmost care and supply it with plenty of hiding places in the quarantine tank. Disturbances should be limited only to the essentials such as feeding and lights should not be suddenly turned on no matter how much you want to look at your latest purchase.

Poisoning

Natural metabolisms can cause poisoning and the first obvious prevention of this condition is not to allow uneaten food to pollute the tank. Do not sprinkle food over a tangle of coral where neither the fishes nor yourself will be able to retrieve it, but feed over a flat part of the tank. Marine fish, if fed properly and in a healthy condition, will seldom allow even the tiniest morsel of food to reach the bottom so feed wisely at all times. Other forms of poisoning can sometimes be traced to small animals such as snails which inject the fish by means of a built-in syringe but this type of poisoning is rare. The more obvious poisoning causes by such items as metals have already been discussed but the most common of all, so often overlooked, is chlorine. Suspected chlorinated water should be filtered through activated carbon and allowed to stand for a few days. The chlorine will leave the water faster at a high temperature.

Poisoning can even be caused by excess smoke from cigarettes if the air pump takes its supply from the same room and in such places the air pump should be moved into a clean air position.

Poisoning can easily be confused with several disease symptoms but the cause of it cannot and should be located as soon as trouble begins. Poisoning symptoms are often displayed by restlessness, abnormal movements such as sharp dashes around the tank in no particular direction followed by breathlessness and finally an inability to keep upright. Towards the end the fish will change colour and sometimes turn black. The only cure I have used for poisoning is the location and removal of the cause followed by a complete water change but advanced cases are seldom cured.

Ichthyophonus

This disease, unlike the last two, is an internal parasitic ailment and not a skin disease even though the skin is affected. It can be caused by algae spores but is usually the result of bad foods which are either unclean or from a diseased fish. The belly of the infected fish swells up to a prodigious size and the scales in that area are lifted even to the extent of blood being forced out. It resembles dropsy and is often accompanied by popeye. 500 mg. of Penbritin per gallon cured my own sufferers but penicillin and streptomycin at half this strength each may be used.

Next month we discuss: Oodinium, Benedenia, Ichthyophthirius, Lymphocystis, Argulus, Exophthalmus, Saprolegnia, Wounds, Ozone.

Stone-fly larvae

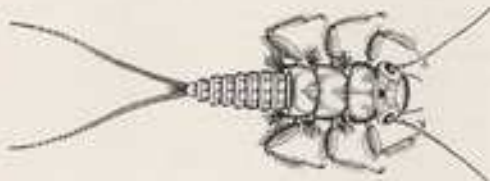
by Bill Simms

ALTHOUGH stone-fly larvae are mostly found in running water, there are occasions when one will be found in the aquarium and its superficial resemblance to a dragonfly larva, which is truly dangerous to small fish, may cause concern. It is well to know the difference.

Stone-fly larvae (Plecoptera) are of various sizes according to their family. The one illustrated is a *Perlidae* species, and these are between half and one inch long. There are many smaller kinds and a few larger.

The smallest kinds feed on algae and microscopic creatures. The largest are carnivorous but because they feed on very small creatures can rarely do any harm in an aquarium. In a breeding tank, however, they could be most dangerous to small fry and eggs.

When hunting their prey these stone-fly larvae rely more on their feelers than on eyesight, which is poor. The feelers use that queer taste-smell sense so often found in insects. At the rear end of each thoracic body segment is a tracheal gill with which it extracts oxygen from the water. Stone-flies require lots of oxygen and that is why they are mainly found in running water.



After anything from one to three years in the larval state the mature larva climbs out of the water for its metamorphosis. There is no pupation. The back of the thorax splits and the stone-fly climbs out of its old skin.

These adult stone-flies live only for four to six weeks during which time they must live on the fat stored up during their previous larval state for their mouth parts are not properly developed.

Stone-flies do not fly well, although equipped with wings and mostly crawl about in fairly dark protected places. There they mate and after fertilisation the female carries the eggs around with her for a long time.

Having found some suitable water—they are rarely far from it—the female dips her rear end into the water and the eggs are washed away. Each female lays a large quantity, most of which go as food for other water creatures. Then she dies.

It would be fair to say that the larval state is the true form of the stone-fly and that the adult, winged insect, is merely a temporary reproducing stage in the life cycle. In fact the stone-fly is similar to the may-fly in many ways but the difference in the larval stage is easily recognised. May-fly larvae have three tails against two of the stone-fly.

Larvae of stone-flies, if found in sufficient numbers, can be fed to fairly large fish quite safely.

Danios

Continued from page 55

but in the danios this trait is particularly marked.

Both species are very easy to satisfy at feeding time. They will flourish on any dried food but they should be of a fairly small grain as the fishes mouths tend to be on the small side. Tubifex worms are another particular favourite but I always feel that these should be fed with extreme caution as they come from such filthy waters. The amount of harmful bacteria present in these worms is very large and they should not be fed to any species of fish without first being disinfected with one of the many solutions available for this purpose. *Daphnia* makes an excellent food if it can be obtained in small enough sizes. The size is really only important for the smaller fish such as the zebra danio (*Brachydanio rerio*), pearl danio (*Danio albolineatus*) and the spotte danio (*Brachydanio nigrofasciatus*). The larger fish like the giant danio (*Danio malabaricus*) and *Danio regina* and *siencaris* will have no trouble at all with even quite large forms of food.

Both *Danio* and *Brachydanio* may be kept with other species of fish but, on the whole, it is preferable to give them a tank to themselves. They will then congregate in small shoals and provide an extremely pleasing display. This, of course, is how they behave in their native waters of Thailand, Burma and India. In these countries they are very widely distributed which accounts for their very low cost in this country. As a generalisation one can expect to pay in the region of 3s. apiece for the zebres and pearl danios. The larger species will be costed according to their size but it is usually possible to obtain a 2 in. giant danio for about 6s. As you can see these prices are not high and one can obtain a very attractive display for a moderate outlay.

Breeding the danios is not considered to be difficult. A standard 2 ft. aquarium is quite large enough for the brachydans. The tank should be filled with slightly alkaline water at a temperature of 78°F. The pH value of the water is of little importance but for preference it should be alkaline rather than acid. The floor of the aquarium should be covered with either a layer of glass marbles or pebbles of similar size. This will allow the eggs to slip out of reach of the greedy parents. Prior to spawning the fish should have been conditioned with a diet of live food. To induce the fish to spawn some of the water should be removed and fresh added. Again water movement (not too violent) is desirable. When a pair of fish are to be spawned it is best to add the male an hour or so after the female has been placed in the aquarium. This will allow her to settle in before her suitor presses his attentions on her. When the spawning is completed the parents should be removed from the tank. The eggs should hatch out on either the second or third day and the fry should be able to take infusoria by the sixth day, transferring to brine shrimp on about the fourteenth day. Although the fish live for about three years they are full grown at six months.

Danios (giant danio, etc.) may be bred in a similar manner but the aquarium should be about 36 in. long and plentifully supplied with spawning plants. Like their smaller cousins the parent fish should be removed directly they have completed spawning. The growth rate of the young fish is similar to the brachydans but attempts to breed them should be left until they are nearer a year old. Experiments with cross breeding have been attempted but the resultant specimens are usually very inferior and not capable of breeding.

Aquarium filtration

by T. Hinitt

CLEAN, clear water is an essential in the successful maintenance of the tropical aquarium. Sometimes this can be achieved by heavy planting alone but more often the aquarist would be advised to employ some form of water filtration. This, as well as cleansing the water, will enrich it with oxygen and so ensure each fish of an ample supply. Filtration also provides movement in the water, distributing the warmth from the heater evenly over the entire aquarium. This last fact is of special importance when the tank is situated in a cool spot as the lower water levels can become chilled to a dangerous degree, despite the fact that the surface temperatures may be in the upper seventies. This same water movement also stimulates plant growth.

Certain species of fish such as the danios, rasboras, some of the barbs and nearly all loach, inhabit swiftly flowing streams. To these fish water movement is essential if they are to show their natural behaviour patterns. One has only to look at a danio's streamlined form to see its intended purpose; namely that of maintaining its station in a powerful current. The same can be said for the botias with their slim forms and large powerful tails. Naturally most filters are incapable of providing an extremely powerful current but they do, nevertheless, assist in providing a natural environment.

There are very many different types and makes of aquarium filters ranging from the small variety that fits in the corner of the tank, costing a few shillings, to the large power filter that is a self-contained unit placed outside the aquarium. The latter variety are extremely efficient but they can cost up to £20. Naturally it is useless to place the former type of filter in a 36-gallon tank and to expect good results. The size of filter must be matched to the size of the aquarium although the larger the filter the better will be the filtration. A filter much favoured and rightly so, is the outside variety. These usually consist of a plastic box attached to the side of the tank by means of a clip over the frame. Water enters the filter by means of syphonic action and the filtered water is returned by an air lift. This type of filtration is very efficient as long as the filter medium is changed at reasonably frequent intervals. Another type of filter that is much favoured takes the form of either a plate or a number of tubes placed beneath the gravel. These again work on the airlift principle but instead of removing the waste from the aquarium it is sucked beneath the gravel where the anaerobic bacteria dispose of it. The advantage of the under-gravel filter is that only the airlift is visible. The rest is completely hidden from view. This type of filter will encourage plant growth by sucking the detritus down to their roots. There are several other types of filter used such as ornamental rock filters and bottom filters but these work on the same principle as the other types. Suiting the correct filter to the job is not a difficult task. Here is a rough guide:

- (1) For large catfish use either a large outside or power filter.
- (2) For small varieties use either corner, outside or under gravel filter.
- (3) For marine fish use power filter with special filter media.
- (4) Where plants are the main feature use under gravel filter.

The above is intended as a general guide and, of course, different types of filtration may be employed. The one exception to this is in the case of marine fish. I have kept marine fish for some time and find that the only suitable filter for the job is the Eheim power filter with its special saltwater filter medium. These filters provide the considerable water movement necessary to the well-being of marine fish.

So far I have mentioned but briefly the various filter mediums available. In fact these are as diverse as the filters themselves but most fulfil a specific function. The basis of the filter medium should be either glass or nylon wool; of the two nylon is by far the safest. Glass wool has a habit of releasing tiny slivers of glass into the aquarium. This can prove very harmful to the fishes gills as well as irritating the skin. Either nylon or glass will remove the solid wastes but they cannot dispose of the liquids. To this end some activated carbon should be placed beneath the wool. This carbon is specially prepared for the job and will last several months before replacement is required.

Another use that the filter may be put to is to change the chemical characteristics of the water. Certain species of fish such as *Aphyosemion*, *Cyclolebia* species, most of the tetras and headstanders come from acid waters. To emulate this state in the home aquarium a layer of peat should be added to the filter. In time this will tint the water a brownish colour but the fish will be thriving. A beautiful fish that comes from these acid waters is the discus. This emperor of aquarium fish should always be kept in acid water.

Some varieties will not tolerate acid water conditions. At the forefront of this group must come the marine fish. These will not tolerate any degree of acidity. One should aim at a pH. of at least 7.4. Freshwater fish such as the botias, danios, labeos, and several others prefer alkaline, as opposed to acid, water conditions. Alkalinity can be produced in several ways. Possibly the most foolproof is the addition of crushed marble to the filter although sea shells (gornine) placed in the aquarium will have the same effect. A sure indication of alkalinity is a prolific growth of algae on the stones and sides of the tank. Most tap water, in this country is of an alkaline nature.

Continued on page 77

THE AQUARIST

His excellency the Emperor Tetra

by Mike Thomas and T. Ravensdale

THE Emperor Tetra is one of the newer arrivals to the British aquatic scene, having been introduced a mere three or four years ago. It is not a very popular fish and consequently remains quite expensive. It is somewhat surprising to find such a beautiful fish so scarce, for the Emperor can only be surpassed for colour by the Cardinal Tetra. The Emperor is somewhat similar to the Rosaceous in body shape except for the rather longer body, which is olive coloured, graduating to a light underside, tinged with yellow. If this isn't enough colour for you, a brilliant blue band slashes from caudal peduncle to the operculum with a contrasting dark band beneath. The fins of both sex are yellow but with a little more intensity in the male. A further delightful feature is the growth of a "resident" into the caudal fin. This extraordinary extension of three bars is black lined and, in the male, the centre filament grows longer than the others—as in the male swordfish. A less obvious difference in the male is the longer dorsal fin which is pointed and black edged.

Maturity is reached at about nine months and the life span is seldom more than double this. The males grow to some two inches but the female is usually around one and a half inches at the end of her life.

Breeding the Emperor Tetra is not difficult provided the following recommendations are scrupulously followed. The Emperor is a typical characin but is rather fussy about breeding water. As literature about this relatively new fish is very scarce we can only relate here that which we have actually seen and experienced ourselves—you will no doubt be able to improve on these conditions with your own experiences.

Fully grown "breeding pairs" should not be used—half a dozen unsexed young are preferable. These should be placed in a tank which is not too densely planted and without other fishes. They are perfectly happy in tap water provided it isn't too hard. Once the sexes begin to show—usually first by a deeper colour in the males—separate the sexes. This should take place long before the centre ray shows greater length on the tail of the male.

The Emperor Tetra will spawn far easier when young and males will show their readiness for spawning by a tendency towards scrapping—usually three to four weeks after separation. They will take most foods and will eat readily. When this "scrappy" tendency begins to show you must prepare the breeding tank. The water now required should be clean rain which has been filtered through peat for a week or two. The hardness of this spawning water should not exceed thirty parts per million (CaCO_3). We found the best method to filter peat was to use an Eheim pump with nylon floss both sides of the peat to prevent the introduction of peat into the aquarium. An eighteen inch tank is quite sufficient but a plastic coated (or all plastic) aquarium is better. It is not necessary to shade the aquarium for the Emperor is not a timid fish

and will not be upset by normal movement around the tank.

A nylon mop will make an excellent spawning medium as will a suitable plant—such as *Myriophyllum*. Temperature should be kept at a constant 78°F. Absolute cleanliness is essential from now on so food should not be introduced to the breeding tank; the fish will not starve and will live quite happily for up to a week without it. However, the fish should have spawned in this period—usually within the first three days. Select an active male and one (or two if you wish) females. Do not be concerned if the females do not look "in egg" for they do not bloat up like some characins. Place the selected fish into the breeding tank and wait for results. Should nothing happen within the first three days try changing the fish around, making use of your "spare" specimens.

Spawning usually results in between twenty and thirty eggs being deposited as the fish leave the mop. The eggs are not very adhesive and usually sink so a net trap may be used if you wish. As soon as the eggs are seen on the bottom of the aquarium (this is where a clear glass bottom is useful), remove the parents. The eggs are quite large but, as they are amber in colour, can be quite difficult to spot in peat water. The tank should be darkened at this stage and the mop left where it is. Fungus eggs are rare and fry losses consequently remain few. The eggs will hatch within thirty six hours producing extremely large fry (for characins), and can be fed with infusoria or by a piece of lettuce floated in the tank. The young fish prefer to hide at this age so do not be tempted to shine a bright light into the tank looking for them. They will soon accept newly hatched brine shrimp or micro worm and can be fed thus for the first few weeks graduating to sifted daphnia later. Coloration begins to appear after the second week whereupon the change to tap water can begin. This is achieved by simply topping up daily with tap water. The fry can be moved to a growing-on tank after the fifth week.

There are no doubt many other methods and ideas not discussed here but, provided you follow these few suggestions, there is no reason why you should not enjoy the success we have.

Continued from page 76

Aquarium filtration

Finally, should you suspect that the water conditions are not correct for the type of fish that you wish to keep, a small kit can be purchased from your local aquarist shop. These kits usually consist of a chemical dye which, when mixed with a specific amount of water from the aquarium, will turn a certain colour. On comparing the colour of the water with the chart provided with the kit it is easy to tell whether the water is alkaline or acid and to make the necessary additions to the filter.



News from AQUARISTS' SOCIETIES

THE results of the fourth Open Show of the Huddersfield Tropical Society were as follows: Section 1, Livebearers: Section winner P. Ledger (Huddersfield); Swedish: 1, F. Lodge (Huddersfield); 2, J. & H. Derris (Workop); 3, Mrs. Cohen (Pontefract); Guppies: 1, P. Reynolds (Swillington); 2, I. Anson (Chapelton); 3, J. Gosson (Duram); Mollies: 1, Maura D. Lacey (Airedale); 2, I. Anson (Chapelton); 3, M. Whitlock (Tadcaster); Platy: 1, J. & H. Derris (Workop); 2, W. Bradford (Sheffield); 3, F. Ledger (Huddersfield); Section 2, Barbs: Section winner E. Patten (Marskeby); Small Barbs: 1 and 2, W. Bradford (Sheffield); 2, F. E. Gregory (Duram); Large Barbs: 1, R. Patten (Marskeby); 2, K. Glover (Swillington); 3, R. Wilkinson (Hallifax); Section 3, Characins: Section winner J. Robinson (Marskeby); Under 3 inches: 1, Mrs. Cohen (Pontefract); 2, F. E. Gregory (Duram); 3, T. Grimshaw (Gorton); Over 3 inches: 1, J. Robinson (Marskeby); 2, R. Wilkinson (Hallifax); 3, F. Mulla (Marskeby); Section 4, Carps and Minnows: Section winner Mrs. Cohen (Pontefract); 1, Mrs. Cohen (Pontefract); 2, K. Semler (Swillington); 3, F. E. Gregory (Duram); 1, F. Mulla (Marskeby); 2, M. Noye (Marsden); 3, Mr. Robertson (Tyneside); Section 5, Fishers: 1, A. Maxwell (Workop); 2, Mr. Whitlock (Tadcaster); 3, A. Beasley (Duram); Section 6, Anguillids: 1, A. Maxwell (Workop); 2, C. Woodhead (Huddersfield); 3, Mr. Whitlock (Tadcaster); Section 7, Cichlids: Section winner A. Malby (Rochdale); Dwarf: 1, A. Malby (Rochdale); 2, F. Mulla (Marskeby); 3, J. & H. Derris (Workop); Large: 1, F. Mulla (Marskeby); 2, J. Tansy (Chapelton); 3, F. Ledger (Huddersfield); Anguils: 1, J. Longbottom (Marsden); 2, A. Hudson (Huddersfield); 3, Mrs. Bone (Huddersfield).

Section 8, Toothcarps: 1, C. Holdsworth (Bradford); 2, J. Hodgkinson (Bradford); 3, G. Buxton (Dixie); Section 9, Catfish and Loaches: Section winner D. Sides (Chapelton); Large: 1, D. Sides (Chapelton); 2, W. Parkin (T.A.B.); 3, E. Price (Gorton); Small: 1, J. Tansy (Chapelton); 2, C. Holdsworth (Bradford); 3, J. Robinson (Marskeby); Section 10, Exotic Livebearers: 1, A. Malby (Rochdale); 2, A. Beasley (Duram); 3, R. Boothwood (Leigh); Section 11, Breeders: Egg-layers: 1, L. M. Coates (Gorton); 2, Mr. Cohen (Pontefract); 3, J. & H. Derris (Workop); Section 12, Pairs: Section winner J. Tansy (Chapelton); Livebearers: 1, J. Tansy (Chapelton); 2, I. Bulverston (Nons.); 3, P. McCourt (White Rose); Egg-layers: 1, Mr. Whitlock (Tadcaster); 2, J. H. Brown (Marsden); 3, Miss Lindley (Airedale); A.O.V.: 1, P. Moorhouse (Bradford); 2, B. Piper (B. Kirby); 3, P. Reynolds (Swillington); Gold-winner: 1, Mr. Booth (Bradford); 2, R. Birch (Heywood); 3, J. Wiggins (White Rose); Juniors: 1, D. Bond (Leigh); 2, A. Kaye (Huddersfield); 3, Maura Wilkinson (Gibthorpe); Section 16, Ladies: 1, Mrs. Gregory (Duram); 2, C. Boothwood (Leigh); 3, Mrs. Hodgkinson (Gorton). The entry was above the second Open Show with 427 entries. Mr. R. Patten of Marskeby won Best Fish in Show award.

THE annual general meeting of the Federation of Guppy Breeders' Societies was held recently and resulted in the following list of officers being elected. President: Mr. K. G. Pearce (South Midlands); Immediate Past President: Mr. R. Forest Jones, B.Sc., F.P.G.B.S. (Overseas); Vice-President: Mr. G. Smith, F.P.G.B.S. (Three Counties); Hon. Vice-President: Mr. R. Smith, Prof. O. Wang, Mr. H. S. White, F.P.G.B.S., Mr. A. Littlewood; Hon. Gen. Secretary and Hon. Newsletter Editor: Mr. M. H. Dehagrove, "Willowcroft," Tibberson, Nr., Dretwick, Wrexham; Hon. Treasurer: Mr. A.

Lindley (North Midlands); Hon. Provincial Secretary, Press/Public Relations Officer: Mr. F. D. Hall, Furnham Road, Stallingford, Faringdon, Berks; Stallingford (Provincial); Hon. Overseas Secretary: Mrs. D. Coats (British & Bath); Hon. Librarian: Mr. W. Myers (Eastern Counties); Hon. Journal Editor: Mr. S. Goff (South Midlands); Hon. Show Secretary: Mr. P. W. Jinks (South Midlands); Management Committee: Mr. N. Coates, Mr. P. W. Jinks, Mr. A. P. Wilkinson; Judges and Standards Committee, Chairman: Dr. C. W. D. Culp; Hon. Secretary: Mr. G. Smith, F.P.G.B.S.; Mr. B. Myers, Mr. A. Lindley, Mr. G. M. Davies, Mr. A. P. Wilkinson, Mrs. L. D. Smith, F.P.G.B.S.

The names and addresses of the Section secretaries are as follows: Eastern Counties: Mr. D. Crane, 69 Briggate Road, Harlow, Essex; North: Mrs. G. Bowers, 136 Highway, Pateley, Mon., West Midlands; Mr. G. M. Davies, 129 The Broadway, Walsall, Staffs; Bristol & Bath: Mr. H. C. R. Thomas, 2 Grove Park, Bristol, 2, North Midlands: Mr. A. Lindley, 65 Redgwick Road, Jackdale, North; York Counties: Mr. T. M. W. Brey, 34 Oakdale Road, Basingstoke, Hants; South Midlands: Mr. M. H. Dehagrove, "Willowcroft," Tibberson, Nr., Dretwick, Wrexham; Cheshire: Mr. N. E. Binding, 4 Turfhead Road, Cheshire; Glas.: Overseas: Mrs. D. Coats, 118 Fountains Crescent, Downside, Bristol.

THE Open Show held by Stratford and District A.S. recently attracted a large number of competitors and visitors from Lancashire and surrounding counties. The Stratford Club members, with six first prizes, ten seconds and three thirds gained twice as many awards as their nearest rivals and were the most successful club. "Best fish in show" was a dwarf cichlid owned by Mr. Collinge of the T.A.B. Society. The award for this was a magnificent aquariae designed by K.H. Aquaria, Chatter Road, Old Trafford, Manchester. The results were as follows: Guppies: 1, Mr. Beasley (Duram) 74 pts.; 2, Mr. Allen (T.A.B.) 72 pts.; 3, Mr. Minton (Marskeby) 70 pts.; 4, Mr. Prescott (Belle Vue) 69 pts.; 5, Mr. Matthews (Lytham) 69 pts.; 6, Mrs. Wide (Stratford) 71 pts.; 7, Mr. Woodward (Blackpool) 70 pts.; Swedish: 1, Mr. Mulla (Marskeby) 71 pts.; 2, Mrs. Wide (Stratford) 71 pts.; 3, Mr. Jones (Blackpool) 69 pts.; Small Barbs: 1, Mr. Gregory (Duram) 78 pts.; 2, Mr. Prescott (Belle Vue) 76 pts.; 3, Mr. Hodgkinson (Gorton) 74 pts.; Large Barbs: 1, Mr. Parkin (T.A.B.) 71 pts.; 2, Mr. Wilkie (Stratford) 71 pts.; 3, Mr. Prescott (Belle Vue) 70 pts.; Small Characins: 1, Mr. Gregory (Duram) 78 pts.; 2, Mr. Greenwood (Stratford) 73 pts.; 3, Mr. Booth (T.A.B.) 70 pts.; Characins: 1, Mr. Wilkie (Stratford) 76 pts.; 2, Mr. Moorcroft (Marskeby) 75 pts.; 3, Mr. Parkin (T.A.B.) 70 pts.; Silurians: Mr. Ogden (Duram) 75 pts.; 2, Mr. Beasley (Duram) 69 pts.; 3, Mr. Hodgkinson (Gorton) 68 pts.; Minnows and Danios: 1, Mr. Gregory (Gardbrook) 72 pts.; 2, Mr. Prescott (Belle Vue) 70 pts.; 3, Mr. Jones (Blackpool) 69 pts.; Sharks and Puffers: 1, Mr. Mulla (Marskeby) 79 pts.; 2, Mr. Jackson (Belle Vue) 78 pts.; 3, Mr. Jones (Blackpool) 75 pts.; Rabbits: 1, Mr. Gregory (Duram) 72 pts.; 2, Mr. Gregory (Duram) 71 pts.; 3, Mr. Babbington (Stratford) 67 pts.; Dwarf Cichlids: 1, Mr. Collinge (T.A.B.) 61 pts.; 2, Mr. Malby (Rochdale) 58 pts.; 3, Mr. Mulla (Marskeby) 78 pts.; Large Cichlids: 1, Mr. Guildford (Stratford) 78 pts.; 2, Mr. Guildford (Stratford) 77 pts.; 3, Mr. Allen (T.A.B.) 72 pts.; Anguils: 1, Mr. Woodward (Blackpool) 77 pts.; 2, Mr. Jones (Blackpool) 75 pts.; 3, Mr. Hodgkinson (Gorton) 74 pts.; Catfish: 1, Mr. Parkin (T.A.B.) 78 pts.; 2, Mr. Price (Gorton) 74 pts.; 3, Mr.

Booth (T.A.B.) 73 pts.; Loaches: 1, Mr. Wilkie (Stratford) 78 pts.; 2, Mr. Guildford (Stratford) 71 pts.; 3, Mr. Hodgkinson (Gorton) 71 pts.; Fishers: 1, Mr. Booth (T.A.B.) 71 pts.; 2, Mr. Sutton (Duram) 70 pts.; 3, Mr. Beasley (Duram) 69 pts.; Anabantids: 1, Mr. Matthews (Lytham) 73 pts.; 2, Mr. Mulla (Marskeby) 69 pts.; 3, Mr. Wilkie (Lytham) 68 pts.; A.O.V.: 1, Mr. Cook (Stratford) 75 pts.; 2, Mr. Phillips (Airedale) 71 pts.; 3, Mr. Collinge (T.A.B.) 69 pts.; Pairs Livebearers: 1, Mr. Hodgkinson (Gorton) 76 pts.; 2, Mrs. Wide (Stratford) 75 pts.; 3, Mr. Smith (Stratford) 72 pts.; Pairs Egg-layers: 1, Mr. Charlton (Blackpool) 75 pts.; 2, Mr. Barning (Blackpool) 72 pts.; 3, Mr. McCourt (Gorton) 71 pts.; Breeders Livebearers: 1, Mr. McClements (Stratford) 72 pts.; 2, Mr. Malby (Rochdale) 71 pts.; 3, Mr. Jones (Blackpool) 70 pts.; Breeders Egg-layers: 1, Mr. Mulla (Marskeby) 76 pts.; 2, Mr. Wilkie (Stratford) 74 pts.; 3, Mr. Cook (Stratford) 70 pts.; Plants: 1, Mr. Madsen (Stratford) 76 pts.; 2, Mr. Babbington (Stratford) 73 pts.; 3, Mr. Jones (Blackpool) 70 pts.; Juniors Livebearers: 1, Miss Birch (Heywood) 71 pts.; 2, Master Hodgkinson (Gorton) 68 pts.; Juniors Egg-layers: 1, Miss Matthews (Lytham) 74 pts.; 2, Master Madsen (Gorton) 73 pts.; 3, Master Hodgkinson (Gorton) 70 pts.; Coldwater: 1, Miss Birch (Heywood) 70 pts.; 2, Mr. Greenwood (Stratford) 74 pts.; 3, Miss Birch (Heywood) 73 pts.

AT the annual general meeting of the Warrington A.S. the following committee was elected: President: Mr. A. F. Fighan; Chairman: Mr. P. Norton; Secretary: Mr. R. Trench; Treasurer: Miss Jean Cameron; Show Secretaries: Mr. & Mrs. G. Hall; other members: Messrs. Higham, Hasbitt, Hill, Clark, Bond, Ron Nash, Benson, Cameron, Bryan and Bury; Bewick, Marion Trench, Joan Robinson. Fish of the Month (Annual Report): 1, Airm Gunston; 2, Iren Gunston; 3, Malcolm Nafin.

The Secretary, Ron Trench, arranged much amusement with a talk on his attempts to breed Kribia and the title "Professional Breeding Techniquet" proved the measure of the year. Once again over 60 members were present and all enjoyed the initial production of the Annual Report and Year Book which amounted to 42 pages of original material, and most members received a mention on at least one occasion.

At the Club meeting in April there was an attendance of 64 so that Geoff Collins talk on "Hibernia" and led the lively discussion which followed. It is becoming increasingly obvious that the present accommodation is inadequate for the Club's needs and only the physical limitations of the Club Room restrict attendance at meetings. The Committee are aware of the pressing need to resolve the difficulties and is doing its utmost to negotiate for larger premises offering good facilities. The Mason Smith show in April attracted an attendance of 250 from about twelve Lancashire and Cheshire societies, and was extremely successful.

RECENTLY a three-way Table show was held between Hainworth and District A.S., Mansfield A.S. and the Radkell and Hainwell A.S. Nearly two hundred aquarists and friends attended and sixty entries were received for the three classes which were for Characins, Labyrinth and Livebearers. The results were as follows: Characins: 1, E. and B. Stockdale (MDAS), 75 points; 2, Mr. Allen (HBAS), 75 points; 3, Mr. Dudley (RDAS), 68 points; Labyrinth: 1, Mr. Wooten (HBAS), 60 points; 2, Mr. Whitaker (HBAS), 59 points; 3, Mr. Pegg, (RDAS), 58 points; Livebearers: 1, Mr. Pegg, (RDAS), 78 points; 2, Mr. Wooten, (MDAS), 78 points; 3, Mr. Wooten, (MDAS), 73 points. Thanks are due to both opposing societies for an excellent turnout and special thanks to Mr. J. Bower (MDAS) who will judge at the next leg when HBAS are hosts.

THE Isle of Wight A.S. have had a hectic programme recently. At the annual dinner Mr. J. Strick from Portsmouth A.S. came over and presented the Trophy as follows: L.G.W. Challenge Cup: Mr. Stridley (Poole); Cup: Bummercup Mr. Davison, Horseshield; Mr. J. Wood (Furnished Aquaria); Tents Cup: Mr.

W. Bradley, Guppy Cup; Mr. S. Stevens, Best Tropical Fish; Mr. E. Davison, Best Coldwater Fish; Mr. E. Davison, Best Plant Cup; Mr. R. Norton, On the 23rd April a party of 40 visited Marshall's Aquaria in Buckhurst Hill, Essex, and on the 27th April the annual general meeting was held when the following officers were elected: Chairman, Mr. W. G. Jones; Vice-chairman, Mr. K. Wills; Treasurer, Mr. L. Davis; Secretary, Mr. E. T. Davison; Curator, Mr. S. Stevens; Show Secretary, Mr. J. Hobbs; Committee members, Mr. J. Nolan, Mr. J. Woods, Mr. W. Bradley, Mr. C. Puffy. New members will be welcomed and further details can be obtained from the honorary secretary, Mr. E. T. Davison, Aquarium Cafe, Old Village, Stanhope, LD. W.

THE death is reported of Mr. George Smith, F.F.C.S.S., who was the secretary of the Judges and Standards Committee since 1954. He was an ardent and devoted worker for the Federation and a good friend to the members.

THE members of the Blackpool and Fylde A.S. were entertained recently in an illustrated lecture by Mr. Alan Harper of Poynton, Cheshire, on Tropical Marine Inbreeding. Starting his lecture with a sheet film of his fish-house, he showed the selection of fish that were kept in his fourteen tanks and concentrating on the practical side of setting up a marine tank. At the second meeting of the month there was a film show of French origin of underwater life in the Mediterranean and the Red Sea.

The society also held a display of fishkeeping in aid of the Lifeboat Fund. Misses N. Hadley and B. Lister displayed some fine Furnished Aquaria and a good cross-section of the hobby was displayed to the public. A special tank was made up with cichlids, shipwreck, diver and suitable backing to highlight the fact that the lifeboat in the front of the stand was a collecting box.

THE newly formed Rotherham and District A.S. held the first meeting at the Bridge Inn, Rotherham, on the 12th April, when twenty-seven members were present. The Committee, seven members was formed. The Chairman, M. J. Newtham, Vice-Chairman, L. J. Hall; Secretary, Mrs. J. Hall, 10 Greenborough Road, Parkgate, Rotherham; Treasurer, R. Harrison; also elected were M. Glover, D. Moxon, A. Clarke. A lecture was given by Mr. H. Harrison on the setting-up of an aquarium; also a lecture on Catfish illustrated by colour slides. Details of future meetings and membership for any local residents may be obtained from the secretary at the above address or from the Post Shop, Nottingham Street, Rotherham.

THE first of the two April meetings of the Runnymede A.S. was taken up with a lecture by a local Veterinary Surgeon, and the second meeting was a table show for Characins. This was won by Mr. Shanks (Black Widow), second being Mr. McDowell (Penguin) and third, Mr. Richardson (Australian Rainbow). In the Cichlids the first and third places went to Mr. Greenwood (Aquila) and the second to Mr. Shanks (Freesmooth). While the judging was going on the members had a talk of Marines and a demonstration on setting up a four-inch by four-inch furnished jar by two of the club members.

AT the Yeovil and District A.S. club show for the best Tropical fish the winning exhibits were as follows: C.N. Wright (Dwarf Gourami); G. Gilford (Neon Tetra); J. D. Pagan (Honey Gourami); N. Stainer (President Mr. D. S. Longbottom). A recent speaker to visit the society was Mr. Maurice of London, an F.R.A.S. judge and speaker. On this occasion he gave a talk on "Aquarium Management".

At the April meeting the society entertained the Taunton A.S. for the annual competition for the first club Shield which is competed for each year. Winning exhibits were as follows: Coldwater; 1, London Shubunkin (Taunton); 2 and 3, Bristol Shubunkin (Yeovil); Tropical; 1, Marble Headstander (Taunton); 2, Redfin Black Shark (Taunton); 3, Red Fish (Yeovil).

Taunton were the winners and hold the Shield for 1967. The judge at this show was Mr. Matley of Bournemouth. Mr. Matley at a recent meeting entertained the society to a slide show, and a photographic Quiz concerning fish-keeping generally, which was most instructive to old and new fishkeepers.

THE Annual General Meeting of the Belvidere A.S. was held recently when many matters were discussed. The date for the match show between the B.A.S. and the Goldfish Society of Great Britain was also settled. The new officers and committee members were elected and these were as follows: President, Mr. J. Savage; Vice-President, Mr. P. Brown; Hon. Secretary, Mr. W. Harris; Treasurer, Mr. J. Brown; Reporting Secretary, Mr. N. Price; Registrar, Miss Morgan and Librarian, Miss Kitcher. Other Committee members elected were Messrs. S. Davis, H. Jago, R. Berry, S. Lloyd and G. Stans.

AT the last meeting of the Wootton Bassett Fish Club it was learned that the chairman, Mr. A. Riley, wished to retire and Mr. R. Young was elected to the position. A social evening followed featuring an auction and a bring-and-buy sale.

THE first meeting of the new Hordleth A.S. took place on the 1st May and there was an attendance of 27 members. There was also a slide show together with a raffle and table show. The special class was for Livebearers, the results being: 1 and 2, Messrs. Paul Kirby and Mrs. B. M. Hill, A.O.V. Class; 1 and 2, Mrs. J. Dickinson; 3, Mrs. B. M. Hill, A.O.V. Junior; 1 and 2, Master Paul Kirby; 1, Master Andrew Johnson. The Best in Show was a black shark belonging to Mrs. J. Dickinson. The Society meet every first Monday at 7.45 p.m. at the Machine Institute, Town Street, Hordleth, W. Leeds. The secretary is Mrs. B. Hill, 20 Wellington Road, Leeds.

AT the last meeting of the Worcester A.S. the treasurer of the club, Mr. P. Fashole, gave a very informative lecture on "Blue Goldfish", bringing with him a very fine specimen to illustrate his lecture. Mr. H. Coley another illustrate his lecture along with his very fine specimens of this fish to illustrate further the colour of the above fish. The results of the table show were: Barbs; 1 and 2, Mr. Graham; 3, Mr. J. Jones; Mollies; 1 and 2, Mr. Berwick; 3, Mr. Coley; 3, Mr. Graham; Mr. Fairhurst; 2, Mr. Coley; 3, Mr. Graham and Mr. Whelan. Breeders Exhibitors (best of 10); 1, Mr. Fairhurst; 2, Mr. Graham and Mr. Whelan. The table show was well represented both by quality and quantity, this being the second in a series of four. New members are welcome to the society and should contact the Secretary, Mr. L. Cotton, 117 Cleverdale, Snake Pit, Bromsgrove.

THE Alreborough A.S. held an "Inter-Society Competition" recently, the results being as follows: Livebearers; 1, Master P. Reynolds (Swillington); 2, Mr. Kennedy (Bradford); 3, Mr. Wize (Knaflitz); Barbs; 1, Mr. Stoy (Hull); 2, Mrs. Barry (Swillington); 3, Mr. G. Fletcher (Aireborough); Characins; 1, Mrs. Whyte (Hull); 2, Mr. Whelan (Aireborough); 3, Mr. W. Sneyd (York); A.O.V.; 1, Mr. and 2, Master P. Reynolds (Swillington); 3, Mr. J. Manton (Aireborough); Catfish and Loach; Whitley (Aireborough); 1, Master D. Lacey (Aireborough); 2, Mr. P. Barr (Bradford); Cichlids; 1, Mr. Whyte (Hull); 2, Mr. Stoy (Hull); 3, Mr. Deschamps (Aireborough); 1, Mr. P. Barr (Bradford); 2, Mr. Anahemide; 1, Mr. P. Barr (Bradford); 2, Mr. H. Smith (Knaflitz); 3, Master P. Reynolds (Swillington); A.V. Pairs; 1, Mr. Whyte (Knaflitz); 2, Mr. P. Barr (Bradford); 3, Mr. Stoy (Hull); Breeders; 1, Master D. Lacey (Aireborough); 2, Mr. Whyte (Knaflitz); 3, Mr. (Aireborough); 2, Mr. Whyte (Hull); Best Fish in Show; P. Irvine (Aireborough); Best Fish in Show; Master P. Reynolds (Swillington). The judge was Mr. G. Holmes. The points gained by each Society were as follows: Swillington 15; Hull 12; Aireborough 9; Bradford 8; Knaflitz 8; York 1; Penworth 6; Leeds 0.

IN the Home Furnished Tank competition of the Freeland A.S. first prize was taken by Mr. Roy Williams with 87 points. Second was Mr. Ray Thomas (83 pts.), third, Mr. Albert Hower (79 pts.) and fourth, Mr. Michael Hall (76 pts.). Mr. A. E. Jessop, chairman of the F.H.A.S., visited the 20 stands over a period of two evenings for judging purposes, and the society would once again like to express its thanks. The Journal of the Freeland A.S., issued bi-monthly, may be obtained, price 7s. 6d. p.a., post free, from the Editor, Mr. R. A. Thomas, 54 Beecroft Road, Crofton Park, S.E.4.

THE annual general meeting of the Brockwell and District A.S. was held recently when the Officers elected for the following year were as follows: Chairman, Mr. Ken Phillips; Secretary, Mrs. N. Jordan; Assistant Secretary, Mrs. G. Carter; Treasurer, Mr. Dick Dero; Vice-Chairman, Mr. Morris Carter; Librarian, Miss Johnson; Press Officer, Mr. Richard Armstrong; Committee members, Mr. Les Jordan. Mr. Les Jordan was voted Aquarist of the Year and will receive his award at the annual show on the 23rd September. It was decided to have the meetings on the first and third Thursday in each month of the year, not observing a break for summer holidays this year.

FOR the April meeting the Mildred and District A. & P.S. arranged a programme on pond construction, illustrated by an excellent series of slides kindly loaned by Highlands Water Gardens of Rickmansworth. Various methods of construction were shown, including the planting of aquatic plants in variety. In addition, pictures of selected waterlilies and other waterlily plants that these often neglected flowers are easy to grow and need little attention. The April Table Show was for any variety plants and characters and all the awards went to Mr. John Hattam.

Further information may be obtained from the Secretary, Mr. R. Ruth, 43 Drunkell Road, Dagenham. The meeting place of the Society is St. Lawrence's Church Hall, Dagenham Avenue, Barkingside, Ilford, Essex.

THE Thurrock A.C. reports an encouraging start this year. Several new faces have been seen at recent meetings and old club members are supporting the club very well. The committee's decision to hold a table show at every meeting this year has also proved a success. The results to date are as follows: Guppy (Male); 1 and 2, S. Houlder; 3, D. Durran; 4, G. Parkin; A.V. Mollie; 1, D. Durran; 2, H. Jacon; 3, B. Barber; A.V. Pairs; 1, 2, 3, D. Durran; 4, K. Applard; A.V. Apparia; 1, E. Noll; 2, K. Applard; A.V. Broomtail; 1, J. Hurlbert; 2, G. Rowe; 3, D. Durran. Any information regarding the Club and its activities can be obtained from the club secretary, Mr. S. Hendie, 47 Feltham Lane, South Ockendon, Essex.

AN open show will be held by Gosport and District A.S. on 1st July, and at this function it is hoped to form a Southern Association of Aquarist Societies. It is hoped also that this will help to alleviate the shortage of speakers and help to keep Southern Societies in closer contact. All Societies of the South Coast are requested to send representatives. Details of this and Schedules are available from Mr. K. Clough, 16 Newport Road, Gosport, Hants.

THE Hucknall and Edwells A.S. owing to a much increased membership to 60 members has changed its meeting place to the Half Moon Hotel, Market Place, Hucknall, Notts. Meetings are still held once a fortnight on Wednesdays at 8 p.m. and dates and further details can be obtained from Mr. M. T. Harrington, secretary, 1 Greenwood Vale, Hucknall, Notts. The show secretary is Mr. G. Wainless, 4 Parwell Close, Stockhill Lane, Bawdon, Nottingham.

THE officers elected at the recent Annual General Meeting of the **Berwent Aquarist Club** were as follows: Chairman, Mr. S. Yousang; Secretary, Mr. D. Gates, 21 Mount Carmel Avenue, Derby; Treasurer, Mr. T. Swoborn; Librarian, Mr. W. Greyson; Committee, Mrs. D. Gates, Mr. R. Johnson; Auditors, Mr. F. Reader, Mr. W. Phillips.

MEMBERS of the **North Warwickshire A.S.** enjoyed a talk given at their end of March meeting by Mr. T. L. Dodge, the well-known coldwater fish-keeper. Mr. Dodge, a good friend of the Society, had plenty of useful tips for members. The society outing planned for June to Chester Zoo looks like being a great success as over 80 places have already been booked. At the next-March meeting an interesting table show was held at the headquarters at Kingstanding Road, Kingstanding, Birmingham 22, with Haden Selick, who won by one point.

AT the first April meeting of the **Ellesmere Pond Tropical Fish Society** the members listened to a very interesting talk on fish diseases and cures by Mr. I. Thorskello a well-known fish-keeper on Meryerside and a member of Holeshead and D.A.S.

At the second meeting a table show was held, with the first prize and trophy going to a magnificent Royal Barb entered by Mrs. D. Andrews. After awarding the prizes the judge, Mr. B. Conner, once again gave some good constructive criticism. At the same time as the show, a talk was held and many fine fish and plants available. Details of membership and meeting place can be obtained from the Secretary, Mr. K. Peers, 31 Broadwood Road, New Ferry, Wirral.

AT the annual general meeting of the London Group of the **British Killifish Association**, the Chairman reported that the average attendance at monthly meetings was seventeen, that visitors had been present at most meetings and several of those had later become members of the B.K.A. He thanked members for the support they had given the Group in the past year. The following were elected to serve as officers in the coming year: Chairman, Mr. Mick Packwood; Treasurer, Miss Kay Bullock; Secretary, Mr. John Owen, 49 Duken Court, 214 Peckham Rye, London, S.E.22; Show Secretary, Mr. Ken Owen; Assistant Show Secretary, Mr. Norman Swilling.

The group meets on the fourth Monday of every month and visitors are always welcome. Among the events planned for the programme for this year are slide and tape shows, table shows, and talks on breeding methods by the members. The dates and venues for meetings are as follows: St. Peter's Church Hall, Clapham Manor Street, Clapham, S.W.4, 22nd May, 26th July, 25th September, 27th November; Killbrook House, Shovers Hill Road, S.E.2, 26th June, 11st August, 23rd October, 16th December. All meetings commence at 8.15 p.m.

THE programme of the **Bangor and District A.S.** for the next few meetings is as follows: Jan: Visit to the Marine Department nearby; Feb: Treasure Hunt. Mr. Peter Harnes was elected as Vice-Chairman and at the April meeting the Chairman, Mr. P. T. Gordon, demonstrated the setting up of an aquarium. Anyone interested in tropical fish is invited to visit along to one of the meetings held at the Penguin Cafe, 200 High Street, Bangor, Carnarvon, on the first Wednesday of each month at 8 p.m. The secretary is Mr. Ian L. Thomas, 173 High Street, Bangor, Carnarvon.

THE future of the **Rushampton A.S.** looks quite bright with an increase in membership. Age and club programmes are being planned. The annual general meeting was held recently when Mr. J. A. Wallis, 39 Brunley House, Alton House, London, S.W.15, was elected Chairman. Secretary, Mr. F. Purnham elected Treasurer and Mr. D. Yorks elected Show Secretary. The meetings of the club are held on alternate Wednesdays at the R.B.T.A. Club, Pissace Road, Putney, S.W.15.

THE second round in the **Club Championship Cup Competition of the Crawley College A.S.** took place at the last Club meeting. The judges were Mr. D. Ellis, P.R.A.S. and the results were as follows: 1. Mr. R. E. A. Partridge (*Trichoptera pumilio*) 77 points; 2. Mr. J. H. Partridge (*Bombus agrorum*) 76 points; 3. Mr. T. Guggin (*Geryoneus palustris*) 75 points.

THE first table show of the **Uxbridge and District A.S.** was held recently and there were twenty-five entries. The winners were: Novices: 1. Mr. Spindlow, Blue Acara, 77 points; 2. Mr. Pedgen, Male Guppy, 75 points. The only one entry in the coldwater class was by Mr. Thompson, a Maxrow which gained 77 points. Plaques in the furnished list class were: 1. Mr. C. Funnell, 60 points; 2. Mr. T. Sumner, 58 points. In the A.O.V. Livebearer class Mr. T. Sumner was first with a Lima Villan, 73 points and in the A.O.V. Egglayer class Mr. Moore was first with a red tailed Black shark which scored 74 points.

At the last meeting Mr. A. Boucher gave an interesting talk on the construction of fish ponds, and the stocking and maintenance of them, and many other aspects of coldwater fish-keeping. Photographs of fish taken in Mr. Moore's fish house have been shown, and it is hoped gradually to increase the number of slides so that an evening may be devoted to a full length discussion on the fish shown on these slides.

AT a recent meeting the **Wigan and District A.S.** acted as hosts to the Chorley Society and both enjoyed an excellent and entertaining lecture by Jim Kelly. The results of the table show were: Characins: 1. Mr. G. Brown (Wigan); 2 and 3. Mr. I. Ince (Chorley); Livebearers: 1. Mr. Charley (Chorley); 2. Mr. L. A. Hancher (Wigan); 3. Mr. B. Warren (Wigan). Mr. Kelly was asked to present a new annual trophy to the Wigan member with most table show points throughout the year and this was won by Mr. E. Warren. Meetings are held on the last Tuesday of each month at the Whinmoor Arms, Stancliff, and visitors would be extremely welcome. The secretary is Mr. Ken Birch, 49 Mounsey Avenue, Worley Moss, Wigan.

EXCELLENT progress is reported by the **Amersham and District A.S.** Formed just over twelve months ago the membership is now over 80 and in February this year a Junior Section was started which is going well. The past year has been one of learning for the Club and in this connection the Committee would like to record how indebted they are to the High Wycombe Club for the help they have received. The officers elected for the current year are as follows: Chairman, Mr. J. K. Harding; Secretary, Mrs. V. Keating, 62 Crosswood Road, Chesham, Bucks.; Treasurer, Mr. L. J. Williams.

DURING the **Independent A.S.** recently held annual general meeting, it was announced that the club's Secretary, Mr. R. White, and its Treasurer, Mr. J. Kettle, were retiring from office after serving the club splendidly for many years. During the evening the following members were elected to replace them: Mr. J. Chapman as Secretary, and Mr. A. Scudler as Treasurer. The club's Secretary's address is now, of course, Mr. J. Chapman, 93 Bazon Dwellings, Upper Street, N.1. In the forthcoming quarter there will be lectures on Live Foods, Marine Tropicals, Plants and Serranids, and many competitions. New members are always welcome at the Independent on any Monday evening at 8 p.m. at Mounsey School, Hornsey Road, N.8.

AT the April meeting of the **Begonia Society, Derby**, besides having the monthly Table Show, Mr. W. Christian of Nottingham gave a talk on what work goes into arranging a Three-day Show such as the Nottingham Society have such year. It was very interesting, especially to some of the new members who are just taking up showing fish.

THE April meeting of the **Boston A.S.** proved very enjoyable, the main item being a film loaned by Mr. G. Gaudin, the author being "Fish of Israel". The Table Show was Christmas and the results were: 1. Mr. R. Sykes, 2. Mr. A. Woodhouse, 3. Master M. Smith. Meetings are still held at St. John's Hall, Threadneedle Street, Boston, first Thursday every month.

A SUCCESSFUL visit was paid by members of **Newport A.S.** to Chesham recently in order to compete against the local society in an inter-club Table Show. The result proved to be a victory for the visitors, winning the Egglayer Class by 543 to 536 points, and the Livebearer Class by 551 points to 541 points. Individual results were: Egglayer, 1st Lt. P. G. James (Newport) and N. Hughes (Chesham); 2. P. G. James (Newport); 3rd 4th, M. J. Peay (Newport) and L. Tustin (Chesham); Livebearers: 1. and 2. P. G. James (Newport); 3. R. M. Gossop (Chesham).

Guest speaker at the society's April meeting was Mr. Norman Mason-Smith, of Cambridge, who presented his excellent 8 and 16mm films on aquatic and allied subjects. Visitors from several of the neighbouring Walsh societies were also in attendance.

Plans for the annual open show of the society to be held on Saturday, 16th September at the Stow Hill Secondary School, Newport (venue to be confirmed) are now well advanced. Three of the four judges required have been appointed: Mr. J. W. Sanders (Bradford), Mr. Dennis Bayliss (Wotton-under-Edge) and Mr. Barry James (Chesham).

DETAILS of the **Bodworth A. and P.S.** Table Show were as follows: Grade 2—Livebearers: 1. Mrs. E. Leigh (Lyceral Mollie); 2. Mr. and Mrs. W. Gossop (Various Goldfish); 3. Mr. K. Jones (Black Mollie); 4. Mr. K. Jones (Black Mollie). Grade 2—Egglayers: 1. Mr. E. Leigh (Dwarf Gourami); 2. Mr. J. Gudgey (Royal Barb); 3. Mr. D. Montgomery (Gordonia Arora); 4. Mr. R. Shakerpoint (Australian Rainbow). Grade 1—Livebearers: 1. Mr. and Mrs. D. Deves (Red-eyed Red Sword) also the best in the show; 2. Mr. R. Scally (Marigold Pkwy); 3. Mr. R. Scally (Black Sword); 4. Mr. and Mrs. D. Deves (Festiva Pkwy). Grade 1—Egglayers: 1. Mr. and Mrs. D. Deves (Muscicla Gossami); 2. Mr. R. Scally (Gordonia Meyer); 3. Mr. R. Scally (Callisoma Ahi); 4. Mr. and Mrs. D. Deves (Laur Gossami).

AT the April meeting members of the **Pontefract and District A.S.** were entertained with a tape-recording from Australia, a slide show from America and a movie on Fish. Mr. Ray Harnes gave the history and judged the Table Show (the results being as follows: Guppies—1 and 2. G. Nash; 3. T. High; Livebearers—1. T. Turner; 2. S. Callin; 3. D. Cohen; Goldfish—1 and 2. A. Town; 3. C. Asquith).

AT the Annual General Meeting of the **Halifax A.S.** Mr. David Skidell was elected Chairman, Mr. R. Wilkinson, Treasurer and Mr. A. G. Whym, 11 Rothwell Drive, Halifax, Tel. Halifax 52062, Secretary. The attention of prospective members is drawn to the new meeting place which is Chase Hall Secondary Modern School, Room 2, Prescott Road entrance. The meetings are held fortnightly, the next one being held on 7th June, 1967, and old and new members will be most welcome.

THE officers elected at the Annual General Meeting of the **Nottingham and District A.S.** were as follows: President, Mr. C. Hill; Vice-President, Mr. H. R. B. Odam; Chairman, Mr. M. H. Goodliffe; Vice-Chairman, Mr. A. Saxon; Secretary, Mr. K. Green, 253 St. Ann's Well Road, Nottingham; Treasurer, Mr. E. B. Binn; Show Secretary, Mr. W. J. Christian, 49 Moor Lane, Buzby, Notts.; Breeder's Section, Leader, Mr. G. Bullymore; Bulletin Editor, Mrs. B. M. Goodliffe; General Committee, Mrs. Bullymore, Messrs. B. Inman, C. Jones, T. Gaskell, K. Roberts, F. Sanders

and G. Wood, Founder members of the Society, Mr. and Mrs. H. P. Lynn and Mr. H. Walker, along with Mr. W. Warley were unanimously elected as Life Members.

Meetings are held at 7.30 p.m. on the last Tuesday of each month in the 1st Floor room, Peacock Hotel, 11 Mansfield Road, Nottingham. Visitors are welcome to all meetings.

THE annual Open Show of the Valley A.S. attracted 280 entries from 11 Societies. The show which was the first of its kind in the Valley also had a good response from the public. The trophies were presented by Mrs. Wilfrid Whittaker and the results were as follows: Guppies: 1, Mr. Beckwood (Leigh); 2, Mrs. Beasley (Ossett); 3, Mr. Wilson (Valley A.S.). Parakeets: 1, Mrs. M. Wild (Stratford); 2, Mr. F. Ledger (Huddersfield); 3, Mr. A. Mathias (Leigh). Swordtails: 1 and 2, Mr. F. Ledger (Huddersfield); 3, Mr. Mathias (Leigh). Mollies: 1 and 2, Mr. F. Woodhead (Blackpool); 3, Mr. Cook (Glossop). Small Characins: 1, Mr. Wainor (Mansfield); 2, Mr. Bowler (Valley); 3, Mr. Booth (T.A.B.). Large Characins: 1, Mr. Price (Gorton & Openshaw); 2, Mr. Parkin (T.A.B.); 3, Mr. Price (Marsydale). Small Barb: 1, Mr. Kershaw (Heywood); 2, Mr. Percy (Heywood); 3, Mr. Hodgkinson (Gorton & Openshaw). Large Barb: 1, Mr. Parkin (Marsydale); 2, Mr. Parkin (T.A.B.); 3, Mr. & Mrs. Battersby (Valley A.S.). Anguils: 1, Mr. Woodhead (Blackpool); 2, Mr. Booth (T.A.B.); 3, Mr. Woodhead (Blackpool). Dwarf Goldfish: 1, Mr. Stray (Hallifax); 2, Mr. Maitly (Rochdale); 3, Mr. Chapman (Valley). Large Goldfish: 1, Mr. Holmes (Gerrardslip); 2, Mr. Mathias (Leigh); 3, Mr. Jones (Valley). Anabantids: 1, Mr. Ingram (Glossop); 2, Mr. Ledger (Huddersfield); 3, Mr. D. Ledger (Gerrardslip). Fishes: 1, Mr. Jones (Valley); 2 and 3, Mr. Booth (T.A.B.). Rabbits: 1 and 2, Mr. A. Gardner (Heywood); 3, Mr. Ellis (Valley). Doves: 1, Mr. Ingram (Glossop); 2, Mr. Harry (Rochdale); 3, Mr. Bosmer (Ossett). Toothcarps: 1, Mr. Hodgkinson (Gorton & Openshaw); 2, Mr. Taylor (Rochdale); 3, Mr. & Mrs. Charlton (Stockport). Loaches: 1, Mr. Hodgkinson (Gorton & Openshaw); 2, Mr. Price (Gorton & Openshaw); 3, Mr. Parkin (Marsydale). Catfish: 1, Mr. Parkin (T.A.B.); 2, Mr. Booth (T.A.B.); 3, Mr. Price (Gorton & Openshaw). A.O.V. not listed: 1, Mr. Wilson (Valley); 2, Mr. Kershaw (Heywood); 3, Mr. Woodhead (Blackpool). Fancy Goldfish: 1 and 2, Miss J. Philpotts (East Leazes); 3, Master F. Philpotts (East Leazes). Common Goldfish: 1 and 2, Mrs. Davies (Heywood); 3, Mr. Battersby (Valley). Palm Eglers: 1, Mr. Holmes (Gerrardslip); 2, Mr. Murray (Belle Vue); 3, Mr. Stray (Hallifax). Palm Lilies: 1, Mr. Hodgkinson (Gorton & Openshaw); 2, Mr. Cook (Glossop); 3, Mr. & Mrs. Wild (Stratford). Breeder's Egg-layers: 1, Mr. Hill (Heywood); 2, Mr. Beasley (Ossett); 3, Mr. Stray (Hallifax). Breeder's Layingbirds: 1, Mr. Hodgkinson (Gorton & Openshaw); 2, Mr. Birch (Heywood); 3, Mr. Hambrick (Bury). There was also a Junior Section, which was just between Valley and Heywood Societies, the results of which were: 1 and 2, Master D. Atkinson (Valley); 3, Master T. Harris (Heywood). The trophy for the best fish in the Show went to Mr. Parks of Marsydale Society.

AN Inter-Club Show between Ransome A.S. and Haslemore and District A.S. resulted in a win for the latter by 861 points to 888 points and this narrow margin was a credit to the Ransome Society who are a relatively new club. Individual winners were as follows: 1, Roy Frost (Haslemore); Mosslight (Ransome); 2, Eddie Perry (Ransome); Severn and John Thorne (Haslemore); Red Swordtail: 3, Philip Greenwood (Ransome); Red-tailed Black Shark.

New members are always welcome and the Society has new and much larger premises at the Community Centre, Clifton Road, Edwinstown. Meetings are held fortnightly on a Wednesday and commence at 8 p.m. Further information regarding membership can be obtained from the Secretary, Mr. Derek Woodhead of 16 Edwinstown Road, Edwinstown, Midlothian.

NEW members will be welcomed by the **New Goldchester and District A.S.** An interesting programme of Lectures, Exhibitions and "Quizzes" with other local clubs has been arranged. The meeting place is The Warriflow (public house), Magdalen Street, Goldchester. Entry on the first and third Wednesday of each month. Further information can be obtained from Mr. K. Morris, 120 Collingwood Road, Goldchester.

NEW SOCIETIES

25th April a meeting was held in Loughborough, with the object of forming an Aquarist Society. Twenty-three people attended, and there was plenty of enthusiasm. The **Loughborough and District A.S.** was well and truly launched. In view of the fact that few of those present were known to each other the Committee was elected for a period of three months only, as follows: Chairman: Mr. J. Parry; Secretary: Mr. F. Hopwood, 91 Marley Street, Loughborough; Treasurer: Mr. M. Paulson, Show Secretary: Mr. M. Tiller, 8 Loverslade Drive; Librarian: Mr. K. Rawson; Mr. A. Chapman, Mr. S. Parry. Meetings will be held at the "Blackbird Hotel," Blackbird Road, Loughborough, on the first Tuesday and third Saturday of every month, the Tuesday evening meetings being at 7.30 and the Sunday morning meetings at 10.30.

A new Society has been formed in Woking Surrey, called the **Woking and District A.S.** Meetings are held on the first and third Tuesday of each month in private rooms at the Prince of Wales public house, St. John's, Woking. Membership at the moment stands at 30 jobs, and all new members are welcome. Details obtainable from the Secretary, Mr. J. Luggar, 5 Mansford View, Mount Benger, Guildford, Surrey.

AQUARISTS' CALENDAR

- 2nd June: Carlton A.S. Open Show. Full details from Show Secretary, Mr. R. D. Owen, 42, Elmer Road, Canford, London, S.E.6.
- 4th June: Farnham and District A.S. Open Show.
- 10th June: Salisbury & District A.S. Open Show. Secretary, Mr. I. Goddard, 99 Farnham Street, Salisbury.
- 11th June: Lytham A.S. Open Show at Lytham Pavilion, Lytham.
- 11th June: Thorne A.S. Open Show at Thorne Grammar School, Thorne. Secretary, Mr. D. Walls, 17, Masson Court Gardens, Thorne, N. Yorkshire.
- 17th June: Brighton and Southern A.S. Annual Open Show at The Raffle Hall, Hove. Enquiries to Mr. Roy Browning, 34 Rowan Close, Purnville, Sussex.
- 17th June: Uxbridge and District A.S. Open Show. Meadow School, Royal Lane, Hillingdon, Uxbridge. Details from Mr. P. Gieger, 7, Choochly Avenue, Uxbridge.
- 18th June: Glossop A.S. Open Show. Secretary, Mr. John Ingram, 11 Charlton Road, Glossop, Derbyshire.
- 19th June: Stone A.S. Annual Open Table Show to be held at the Walton Community Centre, Walton, Stone, Staffs.
- 24th June: Southampton and District A.S. Open Show at St. Peter's Hall, Commercial Road, Southampton (opp. Gunpowder Arsenal). Hon. Show Secretary, Mr. D. V. Jones, Five Fairs, Caversham, Southamptn.
- 25th June: Altrincham and District A.S. First Open Show at the Altrincham Arts Centre, Clonsfield Road, Altrincham. Schedules available from Mr. S. Hill, 35 South Street, Riddings, Derbyshire.
- 25th June: Didcot and District A.S. Open Show at The Old Labour Club. Schedules from Mr. P. Tisdley, 2 Morrell Close, Didcot.
- 26th June: Skipton and District A.S. Open Show.
- 25th June: Clapham and District A.S. Open Show at the Millard Hotel, Clapham in Sheffield.
- 1st July: Barton Grammar School A.S. Annual Open Show. Enquiries specially invited from Junior Section and School Aquarist Societies. Show Secretary, Mr. D. J. Radcliffe, "Randa," Todd Lane South, Lintock Hill, Preston.

2nd July: Leamington & District A.S. Second Open Show to be held at the Warwick Youth Centre, Covent Road, Warwick. Further details from the secretary, Mrs. S. Underwood, 22 Wootton Road, Leamington Spa.

2nd July: Marsydale A.S. Open Table Show.

5th July: Hasingsden and District A.S. Annual Show at St. John's Hall, Victoria Street, Basingstoke. Schedules from Mr. A. Marshall, 61 Pinner Close, Basingstoke, Hants.

6th July: Chorltonham & District Aquarist Society. First Open Jar Show since re-formation of old Society. Christ Church Hall, Madbury Road, Chorltonham. Details from Mr. R. Deelman, 42, Newton Lane, Prestbury, Cheshire.

7th-12th August: Portsmouth A.S. Open Show.

23rd-26th August: Midland Aquarist and Pond Society. Annual Open Show at Rugby Hall, Birmingham. Show schedules from Mr. I. Wirtz, 120 Franklin Road, Kings Norton, Birmingham, 30.

26th-27th August: Harlow A.S. Aquarist Show. Secretary Mr. J. Denton, 28 Long House Road, Harlow.

26th-27th August: Ocean A.S. Annual Yearly Show.

2nd-3rd September: High Wycombe A.S. Annual Open Show at the High Wycombe. This will include a Guppy Show staged by the Three Counties section of the F.G.B.S. to be held under their rules. Details for both sections from Mr. C. Pike, 18 Ashley Drive, Tylers Green, Pinn, Bucks.

2nd-3rd September: Year and District A.S. First Open Table Show. Schedules from Show Secretary, Mr. J. B. Powell, 114 Cornhill Court Road, Yate, Glos.

2nd September: Brighton and Redhill A.S. First Open Show. Secretary (Show) Mr. E. Bass, 2 Cassine House, Hens Road, Redhill, Surrey.

9th-10th September: Nottingham and District A.S. Open Show at the Drill Hall, Triumph Road, Nottingham.

10th September: Huddersfield Tropical Fish Society. Full Open Show. Secretary, Mr. L. Keys, 6 Thomas, Huddersfield, Huddersfield.

10th-16th September: Bland A.S. Annual Open Show at Babington Parish Hall, Gloucester Road, Bristol. Hon. Secretary, Mr. W. G. Mann, 18 Imperial Road, Bristol, 4.

10th September: Newport A.S. Annual Open Show, Snow Hill Secondary School, Newport (to be confirmed). Show Secretary, Mr. M. J. Parry, 45 Western Drive, Gabaio, Cardiff.

17th September: Atherton A.S. Open Show. This is a provisional date. Show Secretary, Mr. A. W. Spencer, 15 Orchard Close, Walsley, Atherton, Warwick.

23rd September: Blackwell & District A.S. Open Show, Victoria Hall, Blackwell, Berks. All residents outside from Show Secretary, Mr. B. Johnson, 18 Highfield Close, Cove, Parnborough, Hants.

24th September: Blackpool and Pyrls A.S. Open Show at Harrowdale Solitum, South Promenade, Blackpool.

24th September: Marbury A.S. Open Show. St. John Fisher School, Ordnamas Street, Clatham. Schedules are obtainable from Mr. E. Brown, 5, Allison Avenue, Gillingham, Kent.

1st October: Heywood and District A.S. Open Show at Labour Club, Bridge Street (opposite Seven Stars), Heywood, Lancs.

7th October: Mid-Herts A.S. Open Show at St. Paul's Church Hall, St. Albans.

20th-20th October: British Aquarists' Festival, Biller Vic Zoological Gardens, Manchester. Details from Mr. G. W. Cooke, Spring Grove, Field Hill, Batley, Yorks.

25th November: Fish, Frothy and Aquaria Show organized by the Borough Council of the London Borough of Hackney, King's Hall, Lower Clapton Road, E.8.

3rd December: Leeds and District A.S. Open Day Show.

3rd December: Ayrleborough & District A.S. Annual Open Show.

Good Fancy Goldfish

Orandas - Bubble-eyes - Red-headed Orandas - Celestials, Moons - Lion Heads - Pearly Scales - Calico-fringe Tails

Breeding size from £2 10s. to £7 according to size.

Youngsters 4/- each.

Packing and carriage 8/6. S.A.E. please.

H. TISBURY
21 QUEENS ROAD
WALTHAMSTOW
LONDON, E.17



Nearly 20 years' practical experience ensures that our HEATERS and THERMOSTATS have reached a high standard of performance.

Heaters 7/6 Thermostats 18/-

EVANS ELECTRONIC DEVELOPMENTS LTD.
EVONIC WORKS, SHADY LANE, BIRMINGHAM, 22A.

PLEASE SEND ILLUSTRATED LEAFLET TO:

APK 6.87

AQUA-IMPORTS of ILFORD TROPICAL & MARINE

WE HAVE QUALITY AND QUANTITY IN TROPICAL AND MARINE FISH AND PLANTS ALWAYS AVAILABLE.

DON'T DELAY — SEND NOW FOR OUR CURRENT LISTS AND JOIN THE RANKS OF OUR MANY SATISFIED CUSTOMERS.

CUSTOMERS ARE INVITED TO VISIT OUR PREMISES AT ANY TIME AT:

85 WANSTEAD PARK RD.,
ILFORD,
ESSEX
Phone: VAL. 4633

WHOLESALE ONLY

ANGLIAN AQUATICS

offer

125 varieties
of Tropical and Coldwater
Fish and Plants

also

5'-6' Boa Constrictors ..	£12 10 0
Rainbow Boa's ..	from £5 0 0
Caymans 18" to 22" ..	£2 10 0
36" Tegu Lizards (tame) ..	£8 0 0
Giant Marine Toads ..	£2 10 0

Regular shipments of reptiles and fish arriving please phone or write for details.

Open 7 days a week
339 Wimpole Road,
Barton,
Cambridge
Phone: Comberton 352

ALANS **AQUARIUM** **and AVIARIES**



**AMERICAN BABY TURTLES
TRADE ONLY SUPPLIED**

S.A.E FOR LIST

IMPORTERS — WHOLESALERS

162-166 St. George's Road, Bolton, Lancashire
Sundays 10 a.m. to 1p.m.

AQUARIST SOCIETIES

Give us a ring and book a visit some evening or Sunday. Phone CUDworth, Yorks., 497. Good fish and equipment at reasonable prices.

Pet Stores, 206 Barnsley Road, Cudworth, Nr. Barnsley.

We are 4 miles from Barnsley on the Pontefract Road.

GOING MARINES

**MANY RARE CORAL FISH
DISPLAYED IN OVER 20 TANKS**

MARINE FISH SUPPLIES

25, Windmill Hill, Enfield

Weekdays after 6pm All day Saturday and Sunday
Phone 01-363 0285 **WHOLESALE ENQUIRIES WELCOME**

NOW OPEN

Tropical Fish Supplies (Wirral) Ltd.

46, Whitby Road, Ellesmere Port,
Wirral, Cheshire.

Telephone No. Ellesmere Port 4327

Weekly imports of Fish and Plants.

Large Stocks of Fish and Plants.

Considerable wholesale facilities.

Daily Road Deliveries.

Modern Shop Display and Show Tanks.

*For further wholesale
information and price lists
write or telephone above.*

Diamond..... D-Water

Special for your tropical fish tanks in 10
gallon carboys or 5 gallon polythene bags.

All enquiries apply to:- Diamond Products Ltd.,
Connaught Road, Silvertown, London E.16
Telephone:- ALBert Dock 4757.

TROPICAL FISH, QUALITY PLANTS AND EQUIPMENT

are now available at:

"BETTA" PETS

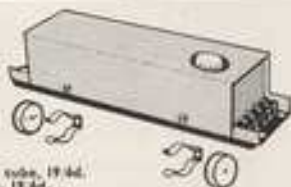
(Bill Matthews & Don Thomson),
285, Ribbleson Lane,
PRESTON, Lancs.
telephone: Preston 58709.

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

**GRO-LUX
 fluorescent
 CONTROL
 KITS**

Comprising:— Choke, Starter and Holder, 2 tube ends, and 2 tube clips.
 Kit A for 15 or 20 watt tube, 19.4d.
 Kit B for 40 watt tube, 19.4d.
 Package. 1 or 2 kits—4.6d. 3 or 4 kits—6.0. 5 kits—7.6d. 12 kits—free.
 Do your kits with choke and starter enclosed in pressed steel box and wired up ready, 12.8d extra.



ELECTRONICS (Croydon) LTD. (Dept AP)
 101/3 Tamworth Rd., Croydon. (Opp. West Croydon Station.)

NOW IN TWO GRADES
**HORNBY'S
 CLEARVIEW
 FILTER MEDIUM**

FINE REQUIRING A FINE LAYER ONLY
 AND
 COARSE FOR FASTER FILTRATION

- ★ FOR USE IN ALL OPEN FILTERS
- ★ USE BETWEEN TWO LAYERS OF GLASS WOOL
- ★ MAKES CLOUDY TANKS REALLY CLEAR
- ★ ABSORBS ALL IMPURITIES FROM THE WATER
- ★ CONDITIONS YOUR FISH
- ★ IS EXCELLENT IN POWER FILTERS
- ★ IS A MUST FOR KEEN AQUARISTS

Price 5/- per carton (or P.O. 6/- sent carr. paid)

615 STRETFORD ROAD,
 OLD TRAFFORD,
 MANCHESTER, 16
 (Phone: TRAFFORD PARK 2189)

W. HAROLD COTTON
 F.R.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 3/-

39, BROOK LANE, KINGS HEATH,
 BIRMINGHAM 14
 Phone Highbury 1483

Freeze Dried Tubifex

3/- per 5 gram pack, By Post 3/4

Halamid

The quick safe cure for White Spot, 3/6, By Post 4/-

The Coventry Aquarist
 43 Melbourne Road,
 COVENTRY

S.A.E. for
 comprehensive
 list of
 TROPICAL
 FISH

BROCKLEY AQUARIA

1, Harefield Road, London, S.E.4.
 Phone: TIDeway 1674

**Tropical marine specialists,
 coldwater marine fish and
 invertebrates. Marine equipment.**

Proprietor, T. Ravensdale, F.B.I.S., F.M.S.S., am., Z.S.

WEBB'S AQUARIA

WHOLESALE
AND
RETAIL

Tropical Fish and
Plants

Reptiles and
Amphibians

WRITE, PHONE OR CALL
Personal Attention — Competitive Prices

27 WEBBS ROAD
LONDON, S.W.11
Telephone: 01-228 8612

PORTSWOOD PET & AQUATIC CENTRE
119 Portswood Road, Southampton
Tel: 56595

Specialist stockists of all types of POND FISH,
WATER LILIES, choice WATER IRISES, BOG
PRIMULAS and full selection of WATER AND
MARGINAL PLANTS.

All sizes FIBRE GLASS POOLS
ready for immediate installation.

Also —

Tropical Marines, Eheim Filters,
Sanders Ozonisers and Reactors,
Stainless Steel and Nylon coated
tanks. Everything for the Marine
Aquarist.

"STIMULITE" DRIED TUBIFEX

Reg. trade mark

(VITAMIN IMPREGNATED)

We are the ORIGINAL packers of this wonderful natural food for all fish

YOU CAN BUY THE ORIGINAL STIMULITE PACK IN ATTRACTIVE DRUMS at 1/6 at retail
Pet Stores, or Direct at the following prices:—

8 drams 3/6, 16 drams 6/6, 32 drams 11/6, 64 drams 21/-, 128 drams (½ lb.) 38/6,
256 drams (1 lb.) 70/- post paid.

Also "STIMULITE" manufactured FISH FOODS, at your stores many sizes, or direct:—

TROPICAL GRADE: (approx 72% Protein) 1 oz. 3/-, 2 oz. 5/-, 4 oz. 7/6, 8 oz. 11/6,
16 oz. 15/6 post paid.

GOLDFISH & POND: 1 oz. 2/-, 2 oz. 3/6, 4 oz. 5/-, 8 oz. 7/6, 16 oz. 10/6 post paid.

We have been manufacturing Fish Foods and Bird Foods for over 47 years with practical experience
in all branches. We will back them for doing their job, i.e., keeping your stock in good robust
health, against any other foods you can buy, we use natural ingredients only—BUY DIRECT and
save £££££—special terms to Aquarist Societies buying in bulk quantities.

P. H. HASTINGS LTD., 182 SULTAN ROAD, PORTSMOUTH

WEBB'S AQUARIA

WHOLESALE
AND
RETAIL

Tropical Fish and
Plants

Reptiles and
Amphibians

WRITE, PHONE OR CALL
Personal Attention — Competitive Prices

27 WEBBS ROAD
LONDON, S.W.11
Telephone: 01-228 8612

PORTSWOOD PET & AQUATIC CENTRE
119 Portswood Road, Southampton
Tel: 56595

Specialist stockists of all types of POND FISH,
WATER LILIES, choice WATER IRISES, BOG
PRIMULAS and full selection of WATER AND
MARGINAL PLANTS.

All sizes FIBRE GLASS POOLS
ready for immediate installation.

Also —

Tropical Marines, Eheim Filters,
Sanders Ozonisers and Reactors,
Stainless Steel and Nylon coated
tanks. Everything for the Marine
Aquarist.

"STIMULITE" DRIED TUBIFEX

Reg. trade mark

(VITAMIN IMPREGNATED)

We are the ORIGINAL packers of this wonderful natural food for all fish

YOU CAN BUY THE ORIGINAL STIMULITE PACK IN ATTRACTIVE DRUMS at 1/6 at retail
Pet Stores, or Direct at the following prices:—

8 drams 3/6, 16 drams 6/6, 32 drams 11/6, 64 drams 21/-, 128 drams (½ lb.) 38/6,
256 drams (1 lb.) 70/- post paid.

Also "STIMULITE" manufactured FISH FOODS, at your stores many sizes, or direct:—

TROPICAL GRADE: (approx 72% Protein) 1 oz. 3/-, 2 oz. 5/-, 4 oz. 7/6, 8 oz. 11/6,
16 oz. 15/6 post paid.

GOLDFISH & POND: 1 oz. 2/-, 2 oz. 3/6, 4 oz. 5/-, 8 oz. 7/6, 16 oz. 10/6 post paid.

We have been manufacturing Fish Foods and Bird Foods for over 47 years with practical experience
in all branches. We will back them for doing their job, i.e., keeping your stock in good robust
health, against any other foods you can buy, we use natural ingredients only—BUY DIRECT and
save £££££—special terms to Aquarist Societies buying in bulk quantities.

P. H. HASTINGS LTD., 182 SULTAN ROAD, PORTSMOUTH

Shirley Aquatics Ltd.

WATER PLANT NURSERIES AND FISH HATCHERIES—Phone: SHIRLEY 130
Stratford Road, Monkspath, Shirley, Solihull, Warwickshire

For success with Marine Tropicals

NEW TROPIC MARIN

The Ready-to-use artificial sea salt
with guarantee

5 gallon size 7/6 20 gallon size 30/-

Postage as follows:-

5 gallons 3/- 20 gallons 3/6
40 gallons 4/6 100 gallons 7/6

This salt makes artificial sea-water almost indistinguishable from natural sea-water.

Usually in stock

for callers only

A good selection of healthy acclimatised Marine Tropicals and Invertebrates

During the month of June we are able to offer beautiful species of marine tropicals not previously seen in Great Britain from the Red Sea. We are also able to offer limited quantities of aquarium-cultivated marine plants. Also available species from the Great Barrier Reef, including the Pale Blue Neon Damsel from 35/- to 50/- each. Also selection of Sea Anemones.

The latest information on plants 1967 edition

A MANUAL OF AQUARIUM PLANTS

Hard bound 27/6 post paid or from your dealer
No aquarium keeper should be without this book

The Shirley range of coloured coral is now available to callers. Red Organ-Pipe Coral, Red Cauliflower, Red Staghorn, Blue Cauliflower, Blue Finger, Orange Branched, Red Propeller.
Pieces from 5/- to 50/- each.

"THE MARINE AQUARIUM MADE EASY"

Send 2s. in stamps for booklet

TROPICAL & HARDY AQUARIUM PLANTS OVER 200 SPECIES GROWN. SEND S.A.E. FOR LIST

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, slight at "The Crown," Monkspath

HOURS OF BUSINESS—Weekdays 10 a.m.—5 p.m. Sundays 10 a.m.—12.30 p.m. for sale of plants only.

CLOSED ALL DAY EVERY MONDAY

TERMS OF BUSINESS—Cash with order please. Fish sent by rail. Tropical minimum order £7-0/6, insulated container and carriage 10/-. Cold water minimum order £3 plus 10/- can and carriage. Plants by post (minimum order 10/-) please add 2/6 post and packing

FOR THE POND

12" and over
NIKISHI-KOI
TRI-COLOUR
(Red, White & Blue)
HARIWAKE
(Glistening Gold & Silver)
from £20 each

A limited number of golden tench for callers

Special offer of tropical aquarium
plants for June only

CRYPTOCORYNE
PURPUREA

12/6 each 3 for 30/-

CRYPTOCORYNE
NEVILLII (Pygmy Form)
2/6 each 5 for 10/-

Bristol Shubunkins for pond or aquaria
from 10/- each according to age and colour



The Bristol Shubunkin