

April
1967

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the
Aquarist
and Pondkeeper



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

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24 x 15 x 12	£ 7 7 0	£ 10 10 0
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SPECTACULAR NEW PRODUCTS**

NEW!

BOTTOM BUBBLE-UP FILTER

Following the success of the outside Bubble-Up. A new super efficient bottom filter; price 8/9d.

NEW!

SUPER DYNAFLO

A partner to the highly successful Dynaflo; price £6 12s. 6d.

NEW!

CHAMPION PM 2000 AIRPUMP

Very powerful piston pump; price £18 15s. 0d.



Available
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Popular piston pumps ■ Regent £7 10s. 0d. ■ Marvel £10 10s. 0d.

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Very powerful piston pump; price £18 15s. 0d.



Available
April

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Popular piston pumps ■ Regent £7 10s. 0d. ■ Marvel £10 10s. 0d.



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**TROPICAL FISH
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12 x 12 easily cut down. 9/- each.

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it's taken
1,000 years
to give me
this well-bred
look



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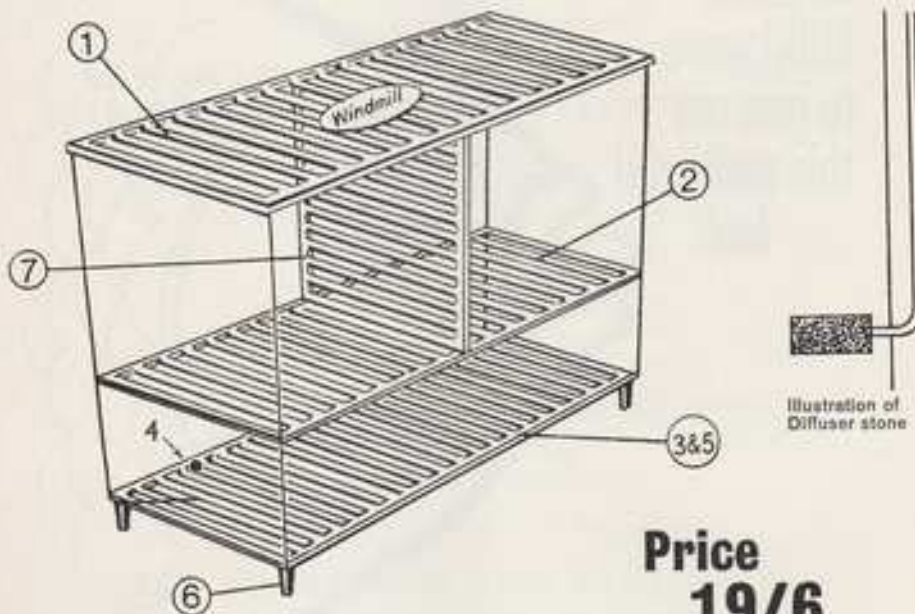
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**Price
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1. Grilled top, base and interior partitions allow water flow and movement of fry.
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Velvet Guppies	8/4 pair	Thicklip Gourami	4/4 each	Aph. Bivittatum	1/- each
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Lynxii	2/4	Jewel	2/4	Notha. Guentheri	17/6
Valleys	4/4	Dwarf	8/- pair		
Liberty	2/-	Paradise Fish	2/- each	CATTYFISH	
Speckled	2/-	Albino Paradise	2/4	Corydora Assota	5/-
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Sunset Varietas	7/- pair			Silver Shark	20/- pair
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Mosquito Fish	4/4			Diamond	12/6 each
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Beacons	2/-				
Cardinals	2/4			CICHLIDS	
Black Widows	2/-			Rainbow	2/- up
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Acostomat Acostomas	15/-			Egyptian Mouthbreeder	4/-
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Fighters Male	7/4 up			Firemouths	4/-
.. Female	2/4 each			Blue Aplos	2/-
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				Festoons (large)	15/-

★ PLUS A SELECTION OF MARINE FISH ★

Minimum order 10/-		PLANTS IN STOCK		Post Paid	
Amphibia	8/- doz.	Crypt. Salensis	2/- each	Water Wickets	2/4 each
Bompa	8/-	Cillias (Broad Leaf)	2/-	Amazon Swords	2/4
Columba	8/-	Cillias (Narrow Leaf)	2/-	Malayan Swords	4/4
Hypnophila	8/-	Cordata	2/-	Borneo Fern	4/4
Myriophyllum	8/-	Griffithi	2/4	Microsorium Frenosus	7/4
Valis (Twisted)	8/-	Beckettii (Large)	4/4	Baccharis Longifolia	7/4
Valis (Straight)	8/-	Willisii (Large)	4/4	Sagittaria Lorata	2/-
Lodigila	8/-	Neubii	2/-	.. Subulata	8/- doz.
Elodea Densa	8/-	Nurii	2/-	Apogonon Crispus	4/4 each

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

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6.4 each
 3.1 "
 3.1 "
 4.8 "
 17.4 "
 6.1 up
 22-2.2 each

 5.1 each
 3.1 "
 27.6 pair
 27.6 "
 17.6 "

 9.1 "
 7.1 "
 3.1 "
 5.6 "
 6.4 "
 4.1 "
 12.6 up

 25.1 pair
 4.1 "
 12.6 each
 6.4 pair
 10.6 up
 7.6 each
 25.1 pair
 18.6 "
 17.4 "
 3.6 "
 3.1 "
 2.4 "

 Paid
 1.4 each
 5.4 "
 4.4 "
 4.4 "
 7.4 "
 3.4 "
 2.1 "
 8.1 doz.
 4.6 each

Be a go-ahead Aquarist! with T.F.H. Products

Announcing a new "Miracle" Food

MIRACLE FREEZE-DRIED LIVER TREET

Packed in a rigid plastic container, this new Miracle Freeze-Dried Liver Treet consists of 10 grams (more than twice the weight of the famous Miracle Freeze-Dried Brine Shrimp Pack) of finest liver particles to which Bovine Blood is added prior to the freeze-drying process. Drop a small piece into the Aquarium or stick a piece on to the inside of the front glass and watch **your** fish swarm to consume this high protein (60%) new food as it slowly absorbs water.

So high in protein! So economical in use!

The price:—Just 6/6 per 10 gram pack

Remember there are now

3 Miracle Freeze-Dried Fish Foods

MIRACLE FREEZE-DRIED TUBIFEX 4/6 per 5 gram pack

MIRACLE FREEZE-DRIED BRINE SHRIMP 4/6 per 4 gram pack

NEW MIRACLE FREEZE-DRIED LIVER TREET 6/6 per 10 gram pack

Goals to Newcastle?

We think that the following extract from a letter received recently from an aquarist in Nigeria illustrates just how good these new Miracle Freeze-Dried Foods really are. Writing about Miracle Freeze-Dried Tubifex she says:—

"I am obliged to you for filling my small order. The fish just love the food and even the native fish which I caught locally, go for it so much that their bellies really fill up and stick out. Native fish have never fed on dry food as happily as they do on these Tubifex."

FEED MIRACLE!

the foods even wild fishes relish!

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(REIGATE 47305)**

**"SPRING TIME IS POND TIME"
LARGE SELECTION OF POND FISH STOCKED**

GOLDFISH 2"-3", 3"-4" 1/6 to 3/6 4"-6" 5/- to 7/6 6"-8" 10/- to 15/6 8"-10" 15/- to 20/-
BREEDING TRIOS 8"-10" 50/- GOLDEN ORFE 3/-, 5/-, 10/-, 25/- each

PLOSTOLINE AND FIBREGLASS PONDS STOCKED — PLANTS — "OTTER" WATERFALL AND FOUNTAIN KITS

TROPICAL SPECIALS: RED SPINEYS 6" £6 10" £9 CAIMEN ALLIGATORS 35/-, £2
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"GREEN SHIELD" STAMPS GIVEN (PERSONAL SALES ONLY)

HALVIN FILTERS
Babyover Bottom Filter .. 4/-
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Hy-Bo "A" .. 130/-
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Clamps .. 1/3
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TROPICALS
Neons, 9 for £1 2/6 each

Rasbora .. 4/-
Angels .. 2/6 & 3/6
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Flays various, from 2/6
Swordtails .. 2/-
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"SWIRL-AWAY"
Aquarium Vacuum Cleaner .. 40/6
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48 x 10 x 15 .. £20 0 0
36 x 12 x 15 .. £24 0 0
Standard Bow £22, £17, £13 0 0

PLANTS

Sagittaria .. from 6d. each
Vallis Ternis .. 6d. "
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Hydrophilis .. 6d. "
Crysozoyne .. 2/- & 3/-
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By post, add 2/-, Minimum 10/-.

HEATERS 25w to 200w

Uno & Wizard .. 8/6
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ADULT RARE FISHES
Pelmatochromis Kribensis 7/6 & 10/- each
Small Discus 1" .. £2 each
Large Saltus Green Mollie .. £1 each
Aristonema .. 20/-, 25/-
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Tin Pail Barbs 2" - 4" .. 6/-, 7/6, 15/-
Silverstarks 2" - 5" .. 20/-, 25/-
Plecomachus .. 20/-, 4/-
Red Veiled Guppy .. 10/- & 15/- each
Red Tail Sharks 5/- & 10/-
Large 15/- each
Keyhole Catfish .. 10/-

Our minimum order for fishes is £2, a charge of 15/- for container, carriage to nearest Main Line Station and insurance, stating time of arrival. Give phone number of postbox.

**NYLON COATED AQUARIUM,
STOCK SIZES**

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

**STANDARD AQUARIUMS
(Light Gauge) (Angle Iron)**

12 x 8 x 6 .. 10/6 24 x 12 x 12 .. 55/-
10 x 8 x 6 .. 10/6 24 x 12 x 15 .. 60/-
14 x 8 x 8 .. 13/- 30 x 12 x 15 .. 80/-
16 x 8 x 8 .. 17/6 36 x 12 x 15 .. 97/6
18 x 10 x 10 .. 23/6 48 x 12 x 15 .. 130/-

COVERS STANDS

18 x 10 .. 16/- 18 x 10 x 36 .. 25/-
24 x 12 .. 23/- 24 x 12 x 36 .. 30/-
30 x 12 .. 25/6 30 x 12 x 36 .. 35/-
36 x 12 .. 27/6 36 x 12 x 36 .. 60/-

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

FOODS

Ecotic Flakes .. 1/6
Hyko Flakes .. 1/-
Bosnian .. 1/9 & 2/6
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Slur .. 2/6 C.W. 2/- & 3/-
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McLynn's .. 1/6, 2/6, 6/6, 17/6
Brine Shrimp .. 2/-, 2/6
Tetra Min Growth Food Haloid .. 4/2
Fantley's .. 8/-, 4/6, 2/6, 2/2, 1/2
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Tetra Min .. 1/11, 2/3, 7/6, 24/6, 84/6
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Postal Charges Add 2/- up to 10/-; 2/6 up to 20/-; 3/- up to £1; 4/- up to £2 (Reception Tanks etc.)
CARRIAGE AT COST CHARGED ON AQUARIUMS, STANDS, AND TANKS. SENT AT OWNER'S RISK
(Inquiries stamped envelope please) Cash with Order please

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Sited on the A41 Route, opposite Hendon Central Station.
391 HENDON WAY, HENDON CENTRAL, N.W.4 Phone: HEN 9700
OPEN 8.00a.m.-6.00p.m. Sundays 9a.m.-1p.m. Emergency Phone: HEN 9700

5/- to 20/-

TERFALL

35/-, £2

20/-

& 10/- each

42 each

21 each

20/-, 20/-

7/6

4/8 each

7/6 to 20/-

2/- & 7/6

7/6 to 15/-

6/- & 7/6

7/6, 15/-

20/-, 25/-

4/-

& 12/- pair

or 15/- each

10/-

& £2, &

Carriage

and

post.

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18/6 & 25/-

on

JMS

(see below)

12 ... 55/-

15 ... 60/-

15 ... 80/-

15 ... 87/6

15 ... 130/-

ANDS

36 ... 25/-

36 ... 50/-

36 ... 85/-

36 ... 90/-

only at

.. 1/8

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1/6, 6/6, 17/6

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2/-, 8/-

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1/2, 2/6

1/6, 4/6, 22/6

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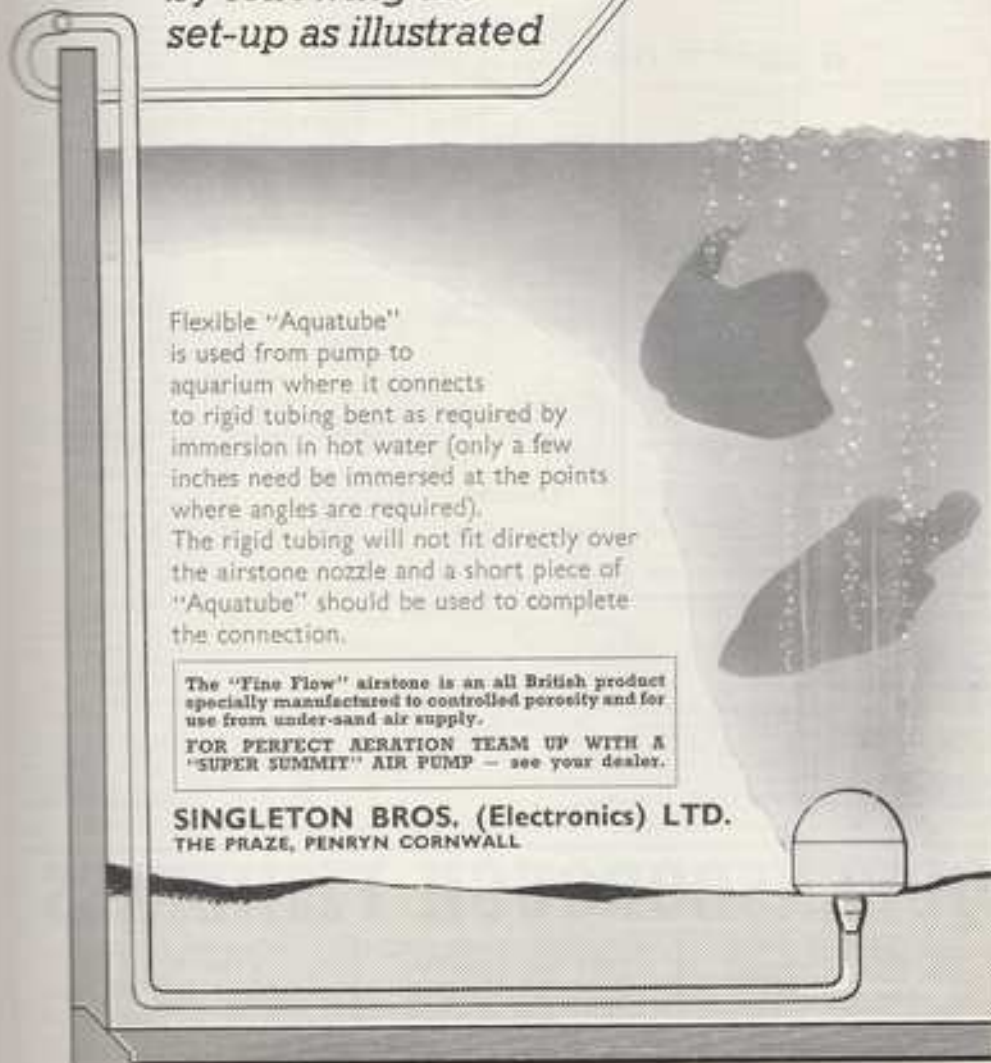
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AQUARIST

KEEP IT NEAT

do away with those untidy dangling air lines by following the set-up as illustrated



Flexible "Aquatube" is used from pump to aquarium where it connects to rigid tubing bent as required by immersion in hot water (only a few inches need be immersed at the points where angles are required). The rigid tubing will not fit directly over the airstone nozzle and a short piece of "Aquatube" should be used to complete the connection.

The "Fine Flow" airstone is an all British product specially manufactured to controlled porosity and for use from under-sand air supply.

FOR PERFECT AERATION TEAM UP WITH A "SUPER SUMMIT" AIR PUMP - see your dealer.

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

SPECIAL PLANT COLLECTIONS

BY POST ONLY

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

TROPICALS	£1	H	£1
A		4 Vallisneria	
30 plants including		4 Moneywort	
Dwarf Lily Cryptocoryne		4 Elodea	
Wisteria		3 Hornwort	

B	£1	AQUARIUM OR POND	£1
12 Vallisneria		12 Sagittaria	
12 Myriophyllum		4 Myriophyllum	
3 Micro Sagittaria		4 Ludwigia	
4 Ludwigia		4 Moneywort	
4 Elodea Densa		4 Hornwort	
		1 Portia Ritzia	
		1 Elodea Densa	

C	£1	7/6
12 Vallisneria		4 Giant Amazon
6 Myriophyllum		Sword Plants 6-8 inches
4 Ludwigia		
4 Elodea Densa		
4 Buxus		
1 Amazon Chain Sward		
1 Portia Clover		

D	£1	2/6
1 Nymphaea Stellata		Water Lettuce
1 Giant Hygrophila		Very beautiful plants
1 Apogonopsis		at 3 for 10/-
1 Wisteria		
1 Giant Sagittaria		
1 Cryptocoryne		
1 Indian Fern		
1 Portia Clover		

E	10/-	10/-
6 Vallisneria		4 Micro Sag
6 Myriophyllum		4 Buxus
6 Hygrophila		2 Amazon Chain Swords
4 Elodea Densa		1 Portia Ritzia

FOND PLANTS	£1	10/-
4 Ludwigia		2 Giant Hygrophila
4 Cabomba		2 Giant Sagittaria
4 Anubias		1 Wisteria
4 Vallisneria		1 Nymphaea Stellata

PLENTY OF GOLDFISH IN STOCK

BOW AQUARIUMS	STANDS
36in. x 12in. x 15in. bow-fronted aquarium with wrought iron backbone stand £19/19/- complete.	18 x 10 x 36 ... 37/6
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The **AQUARIST** AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"



VOL. XXXII No. 1

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.

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.

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MS. 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.

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Cryptocoryne nevillei

by B. Whiteside

A LARGE number of books on tropical aquaria state that certain plants will thrive "under normal aquarium conditions". Few state what the writer considers to be "normal" and hence the reader is left to decide for himself. For this reason many aquarists attempt to grow certain plants only to meet with subsequent failure.

One tropical plant which I have found to grow under a very wide variety of aquarium conditions is the dwarf form of *Cryptocoryne nevillei*. The larger form of the plant I have found to be much less adaptable to changing aquatic conditions. *C. nevillei*, dwarf form, I have grown in water ranging from pH 7.6 to pH 6.6, i.e., from slightly alkaline to slightly acid. Water hardness does not seem to be critical either, plants having grown in water of from DH 4 to DH 8. Probably neither these pH nor DH readings are limits but are only those under which I have grown the plant. Water temperatures can vary also, plants having grown between 71°F. and 85°F. As with the other conditions, lighting can vary from a few hours up to eight or nine hours daily. Plants appreciate some form of feeding under the aquarium gravel, e.g., a mixture of peat and loam, but again the plant will grow, although less strongly, without any additional feeding. Unlike many other members of the genus, *C. nevillei* does not seem to lose its leaves if it is changed from one type of water to another, or if, say, half of the water in the aquarium in which it is growing, is changed. This is one of the major faults of members of this genus together with the fact that plants resent being transplanted and suffer a set-back in growth for relatively long periods.

Continued on page 16

Going marine—Part 3

by T. Ravensdale

Tropical marine fishes

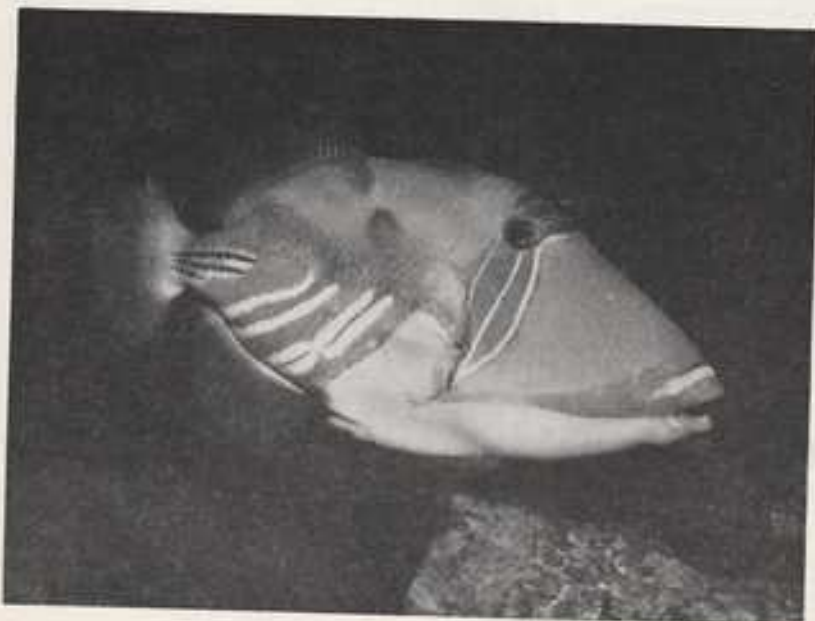
HAVING spent a great deal of time, money and effort on setting up your marine aquarium, it would be a pity to spoil it all now by rushing out and buying the first fish which catch your eye. Study the available types first; take your aquarium size into account and don't buy fish that display even a suspicion of unhappiness. Most coral fish are extremely active and continuously dart around the aquarium so beware of corner-sulkers. Ensure, also, that they are feeding, for complacency at meal times is a sure sign of distress.

To begin with, when looking through the stocks of your fish supplier, make sure his tanks are clean, filtered and protected against metals. Dealers with marine fish in ordinary, non coated, metal aquariums should be avoided at all costs. You do not want fish which have been contaminated by metal poisoning and this condition may take several weeks to become apparent. A marine tank, whether in a shop or at home, should be clean and uncrowded so refuse fish which are kept in conditions you would not keep them in yourself. The presence of algae, however, is not indicative of dirty conditions but care should be exercised in recognising the difference between

marine algae and rust which is rather similar in appearance.

Assuming your water density to be between 1.20 and 1.25, find out the density of the water in which your prospective purchase lives—then compare it with your own. Should your water be e.g. 1.20 and the shop water is 1.25 then, provided the dealer is right, you must change the density of yours 24 hours before the purchase. Salt added to your aquarium should be given this time to saturate or a false reading will result and remember density can change with temperature. Should you already have fish in a given density do not buy fish which are kept in water differing by more than 3 points unless you have a density change tank.

Once you make a purchase insist on a large plastic bag with plenty of water and get it home as soon as possible. Should you have a quarantine tank use methylene blue, disasolve or potassium permanganate as a disinfecting agent and maintain strong aeration for at least a week. It would be a pity to spoil your community setup and lose expensive fish for the sake of impatience (the biggest fault in ichthyology today) and a small all plastic quarantine tank costs less than £1. Water density changes can also be



Trigger fish
(*Rhinecanthus
aculeatus*)

in appearance, even 1.20 and in which your salt with your own. If the water is 1.25 or change the salt. Salt added to saturate or a fish can change the density. Fish kept in water have a density

large plastic bag in as possible. ethylene blue, a disinfecting agent in a week. It is a setup and lose the biggest fault in the quarantine system can also be



Scorpion fish
(*Pterois volitans*)

made slowly in such a container. Coloured plastic buckets or similar containers should not be used for any length of time for marine fish seem to succumb quickly if enclosed in a highly coloured container. If you must use one at all make sure it is all white for the powerful unnatural intensity of any one particular colour upsets the fish to such an extent it may die through shock. Shock is the fundamental killer of most marine fish whether directly or otherwise. In all hospitals a patient suffering from a serious violent change such as an accident is first treated for shock and it is often shock that kills where the wounds may not have done so. Take note, do things gradually and avoid all sharp movements.

Diseases in the marine aquarium usually spread like wildfire and, taking into consideration the vast amount of water per fish in natural habitats, in theory two fish per tank—regardless of size—is one too many, so please don't overstock. A general figure quoted by most experts is 2 gallons of water per fish or 2 in. of fish per gallon but remember, most marine fish grow considerably larger than freshwater specimens—a sailfin can grow from 1 in. to 6 ft. in six months!

Having decided not to overcrowd from the beginning it would seem foolish to purchase fish which will shortly outgrow the safe level of balance vital to a happy aquarium. There are, of course, other reasons for steering clear of certain fish; for example cardinals, volitans, sargassums, surgeonfish and groupers will rarely eat dry food, indeed a

tank containing six small sargassums at night will probably end as containing one large sargassum in the morning! The surgeonfish require lots of algae; the jawfish requires up to 18 in. of gravel depth in which to bury itself at night and so on—the point being don't buy fish you know nothing about or those requiring conditions unknown to you.

Before having your first purchase placed in a container for removal, take a rough respiration count (as stethoscopes don't work too well underwater just watch the mouth opening and closing) and, after it has settled into its new home, take it again. The first sign of distress in any fish is a change of respiration. A doctor will always take his patient's respiration count first no matter what the ailment.

Unlike freshwater tropicals where one tends to purchase pairs, marines should at first be bought singly for they are notorious fighters. In their natural habitat there is far more space and many more hiding places than in a river and territories are claimed. Therefore, when these 'enemies' are placed in a confined space together, fights will result. Damselfish are especially notorious and spend most of their time squabbling. The answer is not to mix fish of the same size and species. A large angel mixed with a similar small one will seldom attack or fight whereas two of equal size will squabble constantly. Cowfish should be regarded with suspicion as should large surgeonfish. Seahorses do not often survive in a community tank either due to their inability to get to the food in time. Scorpion fish however, contrary to opinion can be kept trouble free in almost any

fish
cardinal
(left)

community setup. They soon learn what livestock is intended as food; I have a *Pterois volitans* which only eats female guppies. He refuses all else—even male guppies and brine shrimp. All this may seem very complex to the beginner but it all boils down to one simple rule—Don't just buy fish because they catch your eye without first looking up a reliable text book and confirming that they are 'safe' for your particular conditions. Due to the increasing number of 'new' fish now available this may seem a bigger task than finding out first-hand but then, that's what the experts are for. Marine fish are expensive so let them find out with their resources and wait. Marines will not be rushed.



Dwarf grouper
(*Grammistes*
sexlineatus)

Food.—Sound, strangely enough, seems to be the paramount feature in 'wild' feeding. Vision is limited at depths in the sea due partly to lack of light and partly to the peculiar optical system of a fish. Unlike man, the fish has monocular vision which simply means that instead of simultaneous impulses being passed to the brain, the eye nerves pass information only to one side of the brain and this is why a fish will often rush in the wrong direction completely when excited. This handicap is however compensated by an extraordinary ability to 'hear' or 'feel' food. A shark was recently put into a special tank in Florida with impulse reactors fitted to the heart. Healthy fish placed into the same tank were ignored whereas one with a fin removed caused considerable excitement on the part of the shark at distances up to 300 yds. This not only shows the distance a fish can 'feel' movement but that it is capable of recognizing a fish in distress—or easy food.

Tropical marine fish are sometimes difficult to feed at first but once they accept the first bite they will generally soon learn outrageous gluttons. The obvious thing to do is provide them with a 'teacher'. His frantic rush for food at meal times soon teaches the others what to do. Remember that all marines are wild—unlike their freshwater cousins they have been caught in the sea and have probably never seen man before. They aren't born in captivity and their whole system is upset by the terrifying experiences they have to contend with before finally finding a very strange home indeed. It is indeed remarkable that they ever survive being caught and transported half way across the world at all.

A sergeant major seems completely unaffected by all he suffers and will feed immediately so this may be a good 'teacher' to buy first. Don't buy a clown fish as your first marine; this isn't the easiest—especially the black variety. Damsels soon feed but should be watched closely when mixed as they are extremely aggressive. The best live food I have found to be mollies as they are almost completely unaffected by the salt and an all plastic breeding trap with a few female mollies will give your marine a continuous supply of babies to feed on. Brine shrimp is another obvious food but such a large quantity is needed that one can only regard them as a treat. Tubifex dies upon contact with salt water so only feed that which is taken immediately. White worm is very nutritious and will live a considerable time in salt but it is often some time before fish can be tempted to take it. There are several preparations one can make up such as boiled mussels or scallop, etc., but these are irksome to prepare and will depend on your enthusiasm for supplies. Shrimps and prawns, whether fresh or frozen, should be well washed and tinned varieties should never be used. Small pieces of scraped beef or—better still beef (which doesn't decompose as quickly as other meats in salt—salt beef) are excellent foods but must not be used in excess. Of all the commercial dried foods available, Tetramarin

and freeze dried brine shrimp are most suitable for marines but most dried foods will be accepted eventually. Avoid fatty foods and oily fish and give a little algae occasionally. Surgeon fish will not survive without algae and most marines like it. Care should be taken that floating foods are forced to the bottom for it is unnatural that marine fish should feed at the surface as it is seldom calm enough at sea. A large bat fish or moonfish would either have to lift half its body out of the water to feed or tip upside-down to make sure the food sinks a little and as slowly as possible.

Next month: A list of available fish, easy fish, difficult fish and semi-salt fish.



Group of
Damselfish
(*Chrysipterus eruanus*)

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our readers

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



write

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

pH Simply explained

H. J. VOSPER'S recent letter (more about pH) indicates that the meaning of the symbol "pH" is not fully understood even though an excellent letter, "pH explained", was published on this very subject.

S. P. L. Sørensen did indeed introduce the term in 1909 as a simple and effective means of expressing the acidity or alkalinity of a solution.

The original definition is as follows:—"pH is the negative logarithm of the hydrogen-ion concentration". Thus $\text{pH} = -\log [\text{H}^+]$ where $[\text{H}^+]$ is the concentration of hydrogen ions (in gram-ions per litre of solution).

In order to understand fully the significance of the above statement one must have a knowledge of very basic chemistry since it includes the term "hydrogen-ion". Unless the words hydrogen-ion are understood then pH itself will remain a mystery.

The reason why such an, apparently, cumbersome expression (involving negative logarithms) is used is that the hydrogen-ion concentration may vary between unity and 10^{-14} . However, the pH (as defined by Sørensen) varies only between zero and +14. The advantage of using the pH scale will thus be apparent. A short example may make this a little clearer.

Suppose the hydrogen-ion concentration of a solution is 4×10^{-5} gram-ions per litre. Since $\log 4.0$ is 0.602 then $\log (4 \times 10^{-5}) = 0.602 - 5 = -4.398$. Thus $\text{pH} = -\log [\text{H}^+] = -(-4.398) = 4.398$. Thus we can say that the hydrogen-ion concentration of our solution is 4×10^{-5} gram-ions per litre" or we can state that "the pH of our solution is 4.398".

Both these statements are equivalent but look how much more simple is the one involving pH.

Yours sincerely,
STEPHEN BYLES, L.R.L.C.

Advice Wanted

MAY I, through your publication, ask the secretaries of Societies within our area to contact me as we wish to run an open show later this year. We are a new society, only formed in October last, and have now 28 very keen members.

We would like advice on how to run a show at small outlay and which classes are best supported and of interest to the general public.

Some programmes or entry forms would be very helpful.

of past shows so we may get some of the general ideas.

All our members are fairly new to the Society side of our hobby therefore we can only rely on our fellow Aquarists with experience of these matters.

Yours sincerely,
M. J. HARRINGTON,
5, Greenwood Vale,
Hucknall, Notts.

Advice Required

I AM hoping to start an Aquarist Club in the Woolwich Plumstead area and I would be most grateful for any information that would be of help to me in this venture.

May I take this opportunity of saying how much I enjoy your Magazine and regard this as a necessary editorial and a "must" for aquarists.

Yours faithfully,
T. R. HUNT,
34 Glyndon Road,
Plumstead, S.E.18.

Tank heaters not needed

MANY readers of your wonderful and most interesting magazine do not know where the Island of Malta is situated. Well it is situated in the centre of the Mediterranean between Sicily and North Africa. In Malta we have a very hot climate all the year round, in fact when winter comes, it is not very, very cold, but we have many days of warm and sunny weather during November, December, January and February, the temperature is around 65°F. In Malta we very rarely have cold days for long periods without end. But be sure that after a day or two the sun always comes out to whip the water from the floor (or street).

The sun in Malta throws enough heat to keep a greenhouse warm from the inside without any heaters. I have kept tropical fish (in tanks) in a small room where I keep my fish with glass on one side of the room. The water of one of my tanks was without heater, and the temperature was never below 60°F. In this type of water I kept Guppies, Mollies, Bettas, Zebras and Barbs. The condition of these fish were normal as the others in heated tanks. Now the temperature of a greenhouse is warmer and I think that the water would be around the 75°F. and over.

I would be much pleased to receive letters from all those

...or who had performed some similar tests. I would like to hear from those who own or run Tropical Fish Farms in any part of the world. I will reply all letters received.

Yours faithfully,
JOSEPH JOHN MELL,
"Pat House",
Church Street,
Paceville, Malta.

Correction

ON the cover of the March issue of the *Aquarist and Pondkeeper* you had a picture of a fish which was named as a Mudskipper (*Periophthalmus barbarus*), but surely it was a Moorish Idol (*Zanclus cornutus*).

Yours sincerely,
A. A. LANE,
(Age 14)
Northampton.

Quite right, Master Lane, although we think the species of Moorish Idol is *Zanclus cornutus*. Many thanks to other readers who kindly wrote in to correct our error. (Ed.)

pH Fluctuations

DEFERRING to the letter by P. F. Capon in the *Aquarist* for February, 1967, I must point out that in the tropics, where there is a heavy algal bloom, or a dense stand of macrophytic water weeds a pH of 10 is not only possible but is quite common, and diurnal fluctuations from pH 7.0 to over 10.0 have been known. This phenomenon is one well-known to limnologists who have worked in tropical zones, and it can occur in waters which have been well-limed.

The old theory of bicarbonate-carbonate buffering action needs modifying, particularly if high concentrations of phosphate or sulphate are present. A narrow range of pH is around 7.0, as is usually advocated on the theory of buffering is in fact very rarely attainable in the tropics, since photosynthetic rates are so high that carbon dioxide may become limiting. There is a fair amount of literature on this scattered in various limnological journals. There are also reports of such diurnal variations in Alaska, so that it could conceivably occur in fertile (i.e. eutrophic) waters in temperate zones.

I am,
Yours truly,
DR. G. A. DROWSE,
Director, Tropical Fish Culture
Research Institute,
Malacca, Malaysia.

News from India

I HAVE received the December and January issues of your magazine and was enlightened to get news from Britain about the hobby of fish-keeping. I was not surprised to find out how our prices for tropical fishes were much cheaper than yours because many tropicals are found here and the neighbouring countries. Literally, the fishes which are rare over there are eaten over here. Take for instance the Glass fish; it is sold in the market alive, though so small, on the balance. By taking exchange at 1 sh. equal to 1 rupee (after devaluation) I can confidently say that one thousand to one and a half thousands of those

small glass fishes (*Ambassis lala*) cost 1 sh. The same price goes for Dwarf gouramis, Badis Badis, Cobitis tarnaia, *Barbus conchonus*, *Myras tengara* and *Vitatus*, *Periophthalmus barbarus*, and *Epiplatys maculatus*, *Tilapia mossambica* and *Scaphiagal argus* are much cheaper than these. Even South American fishes are much cheaper than they are in England. But some fishes like the Discus, *Pomacentrids*, Turkey fishes, hatchet fishes and Rasboras are not available.

This hobby is spreading here like fire, but the only difficulty is that nobody wants to establish societies as you have in Great Britain. Here you don't get advanced equipments but the ones you get are enough to keep your fish healthy. There are many tropical fish shops here. In one issue of your magazine I learnt that *Aponogon niger* was rare in your country but here the pure species grows in abundance. Vallisnerias, Hornworts, *Anacharis*, *Myriophyllum spicatum*, water violet, and water hyacinth can be found growing densely around ponds. Lionhead and oranda goldfishes are sometimes available. Only *Corydoras aeneus* can be got here. The government would do well by a fish trade.

MASTER SRIKUMAR SEN,
121 Park Street,
Calcutta 16,
West Bengal, India.

Welcome to All

SINCE I opened my new fish house a few months ago, I have had two nights a week late for fellow aquarists and friends. This is great fun and interesting for us all. I decided to try and organise a club day where clubs could come along and enjoy an afternoon exchanging ideas, etc., but to my utter disappointment I found clubs are sick of going miles to find they are not welcomed with open arms. What has happened to relations between fish keepers and traders?

I have put my full time to fish keeping but don't feel any different than I did when it was a hobby. I have tried to find out who and what is wrong.

The club members I have talked with seem to find very little to buy at some traders—a lot of fish are not for sale, etc. The traders want them in and out quick with no chance of a quick look round the breeding tanks, etc.

The traders say clubs are a waste of time and do a lot of damage. I would like to find out and try to put things right between the hobbyist and traders (perhaps through your columns if possible).

A welcome awaits all clubs here; we have plenty of room, and all fish in the 152 tanks on show here are for sale.

Yours sincerely,
D. B. BARKIN,
32 Victoria Street,
Charteris, Cambs.

Fish for Stocking Wanted

THE Eastbourne Aquarium Society are looking for any large tropical fish to stock the local public aquarium they have taken over, so if you have any tropicals which are outgrowing their tanks, and you are at a loss to find a home for them, we should be pleased to accept. All offers greatly appreciated. Will collect sixty miles radius. Write to Secretary,

C. GEORGE,
6 Hurst Road,
Eastbourne, Sussex.



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The double-tank system

by Bill Simms

KEEPING goldfish in aquaria has always had the one major difficulty: that of providing sufficient space so that the fish have good water to live in which is as free from pollution as possible.

This problem has been tackled by aquarists in many ways. We have provided plenty of plants with sufficient light to keep them healthy; and in addition we have reduced the number of fish in each tank so that they do not overload the plants with excessive amounts of dirt.

But it is still a sorry compromise from which many arbitrary and varied rules have arisen. A square foot of surface to each 1 inch of goldfish. At least a dozen plants for each 1 inch of goldfish. And so on. The marvel is that so many aquarists have managed to keep such healthy fish under these very restricting circumstances. It says much for their devotion to their hobby and to the skill they have acquired.

Perhaps a system I have used for many years will help to make life a little easier for these dedicated cold-water enthusiasts. It will certainly improve the conditions for their fish.

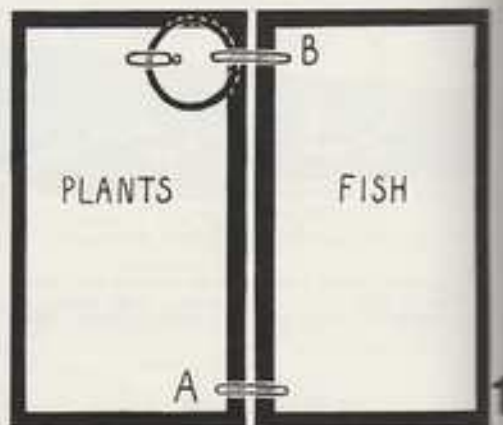
Essentially, the system consists of using two tanks in one of which are the fish, and in the other are plants only. With this set-up it is possible to keep four times as many fish in the single tank as one could with a single-tank system. That is, twice as many as the two tanks could hold if used separately. This is possible because the tank holding the plants acts as a miniature pond. The water from the fish tank is syphoned into one end of the plant-tank, trickles very slowly between the plants and re-syphons back into the fish tank as purified pond water. The ways of doing this will be explained later.

Now, does it work? asks the cynical aquarist. Well, it most certainly does. I have used it without any snags for many years and think nothing of keeping a dozen 2-3 inch goldfish in a 24 x 12 x 12 aquarium—without any change of water for a year.

In addition, a pet-shop keeper, who had frequently complained to me about the hard work involved in stocking his goldfish with daily changes of water to keep them healthy, has been using the system. He finds that in two 36-inch tanks he can carry a stock of 50-100 2-inch fish, in far better health than the majority of shops manage—and with a water change only once every six months. He now uses three such double-tank set-ups.

There are many more aquarists using this double-tank system who can testify to the increase in health of their fish after commencing its use. In particular, those who try to rear large broods of goldfish fry have found it far simpler under this double-tank system and they have been able to rear to maturity many more fish from each brood.

Well, let us get down to the mechanics of the system. You must have two tanks of about the same capacity; one aerator that will have to run continuously, so buy a



good one; one simple air-lift; some lengths of stiff three-eighths inch plastic tubing and rubber tubing to fit this and a wide-necked jar reaching to 1 inch short of the inside height of the tank. This can usually be obtained from the chemist but check what chemical it has held and clean it thoroughly.

Look at drawing 1 which is a top view of the two tanks. Place them alongside each other; the closer the better but see that they stand firmly without rocking or bearing on each other. Decide which is to be the one containing the fish and place the jar in the other in a corner near the fish tank.

Using 1½ to 2 inches of fine gravel as the base in each tank, fill them with water to within half an inch of the top of the jar, that is 1½ inches from the tank top, not forgetting to fill the jar first.

Then plant your plant tank thickly, all over, with plants. I find that 100 vallisneria and 50 clodea dema just about fill a 30-inch tank but you can vary this. Do not stint the plants, however, for they are the most essential part of the whole system.

Now plant your fish tank, as ornamentally as you wish but this time remember that you will have more fish in it and that they will require more swimming space than you have previously allowed. I use shorter plants, about 3 dozen in a 30-inch tank.

Next you make up the syphons. Look at drawing 2. Four right-angle pieces are needed (they bend easily under hot water): one to be long enough to reach well down into the fish tank, and the other three to reach about 2 inches below the water level. Two of the short ones have their bottom holes left open. The other two are sealed at the bottom end, under the water, and have about eight one-

eight-inch holes pierced in their sides near the bottom and well below the water level.

Cut pieces of rubber tubing to join the tops of the syphons in pairs—see drawing 2 again. The completed U-shaped syphon with two short ends goes to position A in drawing 1, with its open end in the plant tank. The other syphon, with the long sealed end, is placed in position B with its open end in the jar.

When the air lift is placed in the jar (see drawing 3) and connected to the aerator, the set-up is complete, apart from the lighting. Both tanks must be well lit for about 8-10 hours each day. Then visit a local pond and fill a one-gal with clean pond water from among weeds if possible. This water, which is full of the right kinds of bacteria, should be poured into the plant tank, and will, within a week, fill the whole system with the proper microscopic fauna and flora.

The system should be left functioning for a week before the introduction of any fish, and during that time you will easily see a gradual clearing of the water. Then introduce your fish. Within a month or so there will be a sparkle in the very slightly green-tinged water that will delight the eyes of the more knowledgeable aquarists; but, and this is most important, the fish will begin to show the effects of this better treatment.

A few further working points. Keep any snails to the

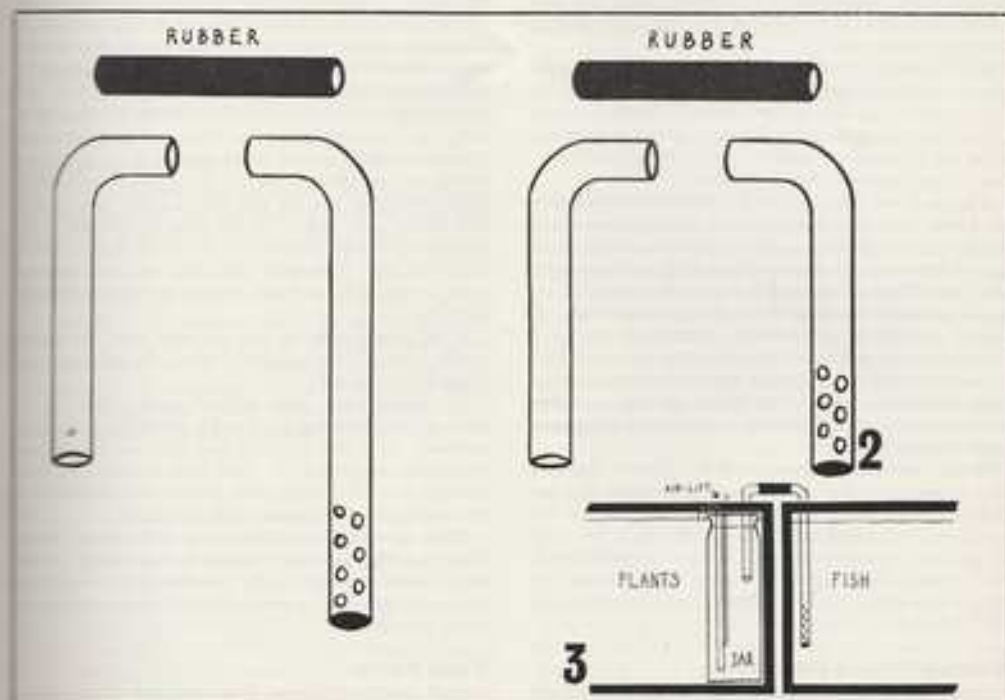
fish side of the set-up. That is why the syphons are sealed at that end. Snails have a habit of crawling into syphons, and blocking them. If you want snails in the plant tank, then use a similar seal excluder on that end of the syphons.

Keep the level of the water in the tanks just below the top of the jar. If the syphon at position A in drawing 1 becomes blocked, the plant tank will gradually fill until it floods into the jar. From then on it will only circulate the plant tank water. That is why the jar must be 1 inch shorter than the tank height. It can never overflow, and is completely fool-proof.

Sediment and algae are inclined to gather in the syphon tubes, thus restricting the flow of water. A smart tap on the rubber joining portion will usually clear this, but eventually the syphons will have to be taken out and cleaned. This is made easy by the rubber junction.

Never disturb the water and bottom sediment that gathers in the plant tank. This will be teeming with the correct kinds of microscopic life, each adapted to its own niche in the balance of your miniature pond. There they will perform their own function of water purifying.

Try this double-tank system, and join the ranks of the less-frustrated keepers of healthy fish. You will find that the tiresome task of water-changing is a thing of the past, even with many more fish in your tank.



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AQUARIST

Pond problems alleviated

by Leon Thorn

THE ideas and suggestion that follow are intended primarily for people with small garden ponds and equally small purses! I am, unfortunately, in this category and have a pond measuring only 5 ft. x 3 ft. x 18 in. deep, but I think it has given me as much pleasure as anything I have ever owned. I have to confess, however, that it was rather rushed and thoughtlessly conceived in the first place because it was constructed of old garden paving-slabs that became available at no cost. These slabs are grouted with concrete and although the pond has sloping sides, with corners filled in with concrete faced with pebbles, it eventually and inevitably suffered from frost damage as can only be expected.

Pond repair

An unsightly and disturbing drop in level of about one foot was finally traced to a 4 ft. long crack between the slabs on one side. After waiting for warmer weather this was successfully sealed, without fully emptying the pond and the consequential disturbance of the fish and plants, by the use of the type of filler used for repairing motor-car bodies.

As those who have a pond and limited space will know, the complete emptying, netting, and temporary care of the fish and plants can be a major operation; therefore the use of this modern commodity was a great saving in time and effort and I am sure my goldfish, tench and carp must have been happier for being left undisturbed!

The crack was first brushed out and then dried with a hair dryer on a long lead from the house (extreme care being taken not to drop the dryer into the pond!). The type of filler used was the paste type with a tube of white hardener. This is obtainable from most garages and nearly all motor accessory shops for a few shillings. It would, perhaps, be unjustifiably expensive to use for a very large crack or hole but the advantage for a small job is that the material sets hard so quickly that the pond can be re-filled within about 15 to 30 minutes and, according to my experience, has absolutely no deleterious effect upon either fish or plants.

If you have no experience with this type of filler and wish to try it, in order to avoid wastage I suggest that you first experiment with a very small amount and that you also mix it with something akin to an old table knife and in an old saucer or tin you are prepared to throw away afterwards, for it does go hard and it does stick! Any material left over is very useful for other filling-in or repair jobs about the house.

Sealing Porous Concrete

After the repair of the 4 ft. crack, my pond level still fell



A typical garden pond as discussed in this article

4 in. or so in a few days though I knew the main crack was adequately sealed. I decided the trouble must be porous or finely holed concrete. However, I had previously just discovered, to my cost, that trichloroethylene dissolved the plastic cup into which I was attempting to degrease some motor parts. This accident was put to good service. Half a dozen of these plastic cups were dissolved in trichloroethylene in a jam-jar and made into a very thin plastic paint. The cups are the thin plastic type issued by coffee machines and many large offices and works canteens. After lowering the surface of the pond with the pump and letting the concrete dry, the top of the water was covered with newspapers and the thin plastic paint then applied with an old paint brush. A full pond for the rest of the summer, apart from evaporation, proved the idea to be both successful and economical and, due to the extremely rapid drying, the pond was topped up again within 20 minutes.

If the plastic cups are first cut into small pieces and rapidly stirred in the trichloroethylene, the dissolving rate is greatly accelerated.

Trichloroethylene, often referred to as "tri-ke", is the basis of many cleaning fluids and is obtainable from some chemists. It is not expensive but there are certain precautionary measures to be taken such as refraining from smoking when it is being used, avoidance of inhalation of the vapour and direct contact with the skin.

If you have access to a free supply of these used plastic cups (you will note I don't suggest buying them!) and can obtain some "tri-ke", the idea is well worth a try for the result certainly gives a very quick-drying waterproof skin to the concrete.

Pond Pump

A small pond such as mine does not justify the expense of



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a conventional submersible pump neither have I the cash to spare, so for two years now an electric washing machine pump has served the purpose of a fountain, filter and emptying medium, giving hundreds of hours of satisfactory service. But if you are not thoroughly competent with electrical work and wish to experiment with one of these pumps, please seek expert advice or assistance for this part of the work.

An approximate timing gives the capacity as about 2 gallons a minute. The pump itself is sealed into an old plastic lunchbox which in turn is covered by a large plastic container with slots cut out for the two $\frac{1}{2}$ in. bore plastic inlet and outlet pipes. The whole assembly is conveniently hidden behind the coal bunker with the two plastic tubes lightly buried where they enter the pond.

A minor snag with the pump was the $1\frac{1}{2}$ in. inlet which had to be "reduced" to fit the $\frac{1}{2}$ in. plastic hose, but this was solved by cutting the shoulder and neck from a small plastic bottle. By the way, just in case you do not know, plastic hose is easily made to fit a larger bore union, say up to $\frac{1}{2}$ in. or so, by holding the hose-end in hot water and then spreading the diameter with the nose of a pair of pliers.

Fountain Jet

The fountain jet itself, after scores of experiments and an enormous amount of childish amusement with various home-made jets, was finally resolved by the use of a 3s. 6d. plastic frog, suitably modified. The frog sits happily on the side of the pond and certainly does not look out of place, with water pouring from the holes I made in his mouth.

Emptying the Pond

For emptying or lowering the water level when necessary, the "frog fountain" is simply pulled off and a spare $\frac{1}{2}$ in. plastic hose is connected to the household drain.

Strainer

The strainer for the suction hose in the pond is made out of an empty, well-washed and well-perforated plastic detergent bottle. When first installed in gin-clear water this looked rather makeshift and out of place, but within a short time the algal growth covered its incongruity and it now looks quite natural and performs its duty well.

Filtering

Most of us seem to have trouble from time-to-time with murky pond water and there seems to be no point in having a pond if we cannot see the fish. I am no exception, but the washing machine pump also provides a useful filter. Here again, when necessary the "frog fountain" is removed and a connection made to a "watering-can filter". The filtering medium is merely a bucket-shaped piece of old bed-sheet, especially fashioned by my wife, with an elastic top. This fits inside a small perforated plastic

bucket which in turn fits into a watering-can, and the filtered water returns to the pond via the shortened spout.

I have found that filtering is best done at the week-end, probably while pottering about the garden, because if the water is very green the filter-cloth needs squeezing out and rinsing after the first hour and then at less and less frequent intervals as the water clears. Filtering usually achieves its object in about 36 hours but the time can be much reduced by first lowering the pond to about half its capacity and then re-filling when the water clears. In hot weather re-filling is best done very slowly first thing in the morning after the pond temperature has dropped overnight and more nearly matches that from the domestic tap.

Priming the Pump

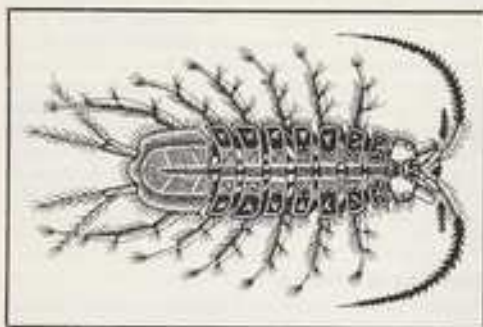
A pump initially made for a washing machine naturally has its limitations and little snags when compared with a more expensive submersible pump, and one of these snags is the fact that the pump is not self-priming. A point to remember is that the pump should be sited at about the same level as the surface of the pond (certainly not much higher) and the pump must be primed before it will work. However, as sucking by the mouth is a rather hit-and-miss affair, and liable to give one a headache, initial priming can easily be achieved by attaching a hose from the household tap to the fountain, then switching on the pump and the tap together. When bubbles cease to emerge from the strainer in the pond, priming will be complete; the tap is then turned off, hose removed, and it will be seen that the pump is then functioning. Providing neither hoses are lifted above the surface, priming will remain and the fountain can be switched off and on at will.

Home-made Nets

After many unsuccessful attempts to buy large mouth but small-mesh nets locally (for netting fish in the pond) my good wife eventually came up with the answer—Terylene curtain material. One yard makes two large nets. First attempts with this material had two corners which "trapped" small fish and made it difficult to remove without the use of the fingers. Finally my wife made two entirely satisfactory nets having a "bucket shape", i.e., with a flat bottom. These are ideal; they soon shake dry, have a fine enough mesh for even the smallest fry and last quite a long time. The frame is made of strong wire bent to shape and this is bound with cord to an old brush handle. The net openings are about 10 in. across.

Fish Food

If I may digress now from the practical side of pond equipment, I wonder if many of you have tried *zeolite peas* as an extra item of food? My goldfish, tench and carp, both in the pond and the aquarium, are very fond of them. The peas are first squeezed between finger and thumb and then just dropped in the water.



The Junior Aquarist

A diagram of a Water Hog-Louse

Waterlife pests and friends—the Water Hog-Louse

by Bill Simms

THE presence of the Water Hog-Louse, *Asellus aquaticus*, need not alarm the aquarist unduly.

Nevertheless, it is a warning, for this is one of the small animals whose presence indicates to water engineers that some degree of pollution exists in that water.

If the water engineer suspects pollution in any water supply he will examine all the small animal life in that water. Predominance of *Asellus* over other forms means that further investigation is called for, but not always does it follow that the water is bad. In many cases the various small creatures may have cleared up what was only a temporary source of pollution.

The Water Hog-Louse is completely harmless to fish, for it feeds only on decaying animal and vegetable matter—detritus. By this means it performs a useful function, together with other small creatures and with bacteria, in clearing away dead objects, and transforming them to a less objectionable form.

In colour this 1/2 inch long creature is usually dirty brown or grey, but under certain conditions it can appear to be mauve-violet. Because the skin is fairly translucent it is probable that its food influences these colour differences.

Because it mainly crawls and clings the water louse moves quite slowly, and can easily be spotted as it moves around in search of food, but there are times when it does swim in a leisurely fashion. Fast running water is useless to it for two reasons: first it could not move easily against it, and secondly it is only in comparatively still water that

it would find food. In fast moving water any detritus is quickly swept away.

There appears to be no special breeding period, for females can be found with young at almost all seasons. Like the water flea and the slater, to which these lice are related, the female water hog-louse has abdominal plates on the front four pairs of legs, and these overlap sufficiently to form a sort of pouch underneath. It is in this pouch that the 50 or so eggs are laid, and carried.

After hatching out, the resultant youngsters remain in this pouch until they are perfectly formed miniatures of their parents. Then they emerge to look after themselves. Presumably sufficient finely sifted detritus will filter into their pouch to sustain them during the 3-6 weeks needed for this development.

The aquarist who finds water hog-lice in his aquarium will probably realise that he has allowed too much detritus to collect on the bottom. One odd water louse is no cause for concern, however. Any reasonably large fish will soon collect it, and in the meantime it will be scavenging along the bottom.

The scallop

by Tom Hurst

THE Scallop has been one of the ancient symbols of the world since the first cave man sketched on the walls of his oothouse. Aphrodite was transported to Cythera Island on a Scallop shell and the emblem of St. James of Spain remains to this day a Scallop. Shells have always fascinated man since he first used them as cutting edges and none have received more attention than the common Scallop. You probably pass one every day even if only on the Shell petroleum advertisements.

The Latin for Scallop is *Pecten* and this, as every schoolboy knows, means comb and no lady of ancient times would be seen without a hairful of Scallops. There are over 250 varieties of Scallop ranging in colour from white, blue, red, purple and black so no doubt their ornamental

attraction was strong.

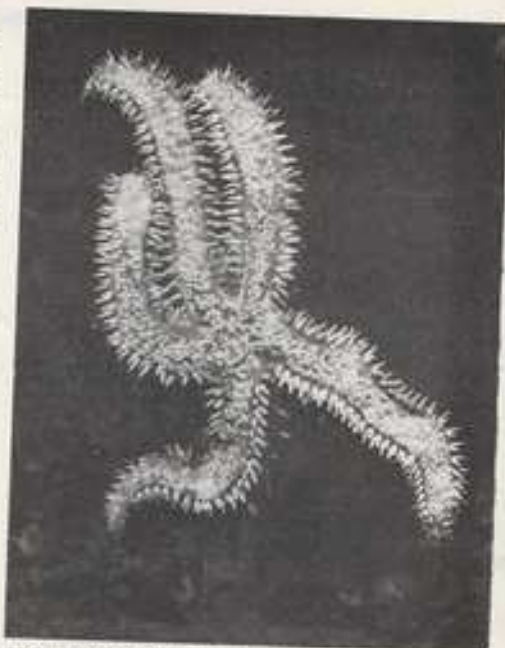
They are extremely lively creatures and can propel themselves through water by opening the shell some 25° and closing it with a slam by actuating the central adductor muscle. This action causes the creature to leap along in not long bounds. It can also frighten away intruders by raising the velum on one side and closing it again rapidly thus causing it to spin around. An escape trick is also managed by raising the velum at the front. Rapid closure in this position causes it to leap backwards. A Scallop removed from water will actuate all these devices at once, forcing its shells together violently for several minutes after exposure.

When the shell is opened a short white circular muscle can be seen. This is the actual Scallop, relished as food by gourmands all over the world and, although everything in the shell is edible, only the adductor muscle is eaten for the Scallop, unlike most shellfish, remains open when dead and the air soon pollutes the organs. Apart from the adductor, an enormous reproductive gland wraps around the muscle assuming the shape of the shell under which lie the gills. Food is filtered through these gills and passed to the digestive organs located between the adductor muscle and the hinge.

The Scallop is generally unable to adapt itself to aquarium life for its food is basically plankton which it normally collects by drifting along the sea bed in a horizontal position with its shell open just enough to admit water high in bacteria content, a condition hardly available in the aquarium—we hope. This feeding process is aided by beating the gills at high speed which separates water from food.

The most remarkable aspect of the Scallop is the number of eyes which surround the inner edges of the shell. These tiny organs glow like cat's eyes for they incorporate the same mirror system as the feline family behind the perfect eye, complete with retinas. Perhaps the most "eye catching" of all Scallops is the common blue eyed (*Pecten caeruleus*) which has over 100 eyes gleaming from between rows of tiny tentacles, similar to those of the anemone, which surround the fringe of the shell. These perfect little eyes grow on the tips of stalks which grow at random when and where they feel like it and, although they appear to be scattered irregularly, several eyes all share the same main nerve via independent optic nerves that surround the muscle. This main nerve is connected directly to the brain. All the eyes are completely blue and grow wherever a space occurs. Eyes removed by accident or surgery will be replaced by new ones within a month. It seems, however, that the brain is incapable of making full use of these remarkable eyes for although they contain a double retina—not found elsewhere in the invertebrate world—a Scallop will only react to large bodies casting a shadow upon them leaping violently when this happens. When it comes to the pinch it is the tentacles that "feel" the enemy and not the eye that sees it.

The main enemy of the Scallop is the Starfish which wraps itself around the shell and forces it open just enough to insert its stomach into the Scallop. It then feeds on the inside, withdraws its stomach and moves on. The victim lucky enough to escape after a Starfish mauling, usually loses a number of eyes and this may be the reason for their excessive number. Perhaps one day we will understand it better.



Underside of Starfish—enemy of the scallop

Remarks on the competition

Your response to our competition has been very encouraging. The essays received are of a very high standard and are giving our judges a great deal of pleasure in reading them as well as difficulty in sorting out the close contenders for the main prizes. The quality of writing and the general treatment of subject-matter was extremely good generally as were some of the drawings and paintings with which the essays were illustrated. It seems likely that we have quite a number of budding writers who, it is hoped, will be encouraged to submit further contributions for possible publication in the Junior Aquarist.

It is hoped that the final results will be published in the May issue. We shall also be publishing some of the best essays in successive issues.

Editor

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Our experts' answers to tropical fish-keeping

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.

What can you tell me about a fish called the merry widow?

The fish popularly known as the merry widow is *Pseudocathartes maculatus*. It is a livebearer from Guatemala that grows no larger than a guppy. The male is noted for the unusual length of his fertilizing organ (the gonopodium). This extends back as far as the caudal peduncle. *P. maculatus* is a peaceful and prolific species and does well in a community aquarium.

In a book on travel in the U.S.A. I came across a reference to a water plant called the Florida devil. Can you please help me to discover this plant's botanical name?

Florida devil is just another of the several common names applied to *Eichornia crassipes*, better known in this country as the water hyacinth.

I have been told that pure lemon juice may be used to acidify aquarium water. Is this true?

Lemon juice can be used to acidify aquarium water, but care must be taken not to introduce too many drops or else the fishes will soon become distressed and gasp at the surface.

Is it a fact that the rhizomes of water lilies are esteemed by oriental peoples as food?

We do not know whether all oriental peoples esteem the rhizomes or tubers of water lilies as food (besides, the rhizomes of some water lilies are poisonous) but a few species (*Nymphaea stellata*, for instance) are cooked and served with curry in some parts of tropical Asia.

What conditions and foods are required for the fish named *Pseudocorymbus divinus*?

P. divinus, commonly known as the dragon-fin should be given clear, well-aerated water and plenty of swimming space in a tank maintained at a temperature of about 75°F (24°C). Any live or dried food normally fed to an omnivorous species will be accepted.

I have just bought two young *Gobiosoma aureum*. They are roughly 1/2 in. in length and look in tip-top condition. How long will it take for these fish to attain a size of about 3 in.?

About 18 months, provided they are kept in a large aquarium and are given their fill daily of such things as chopped and whole earthworms, smallish woodlice, maggots, meat, and the like.

Please give me some information regarding a fish called *Pseudotropheus auratus*.

P. auratus is an African cichlid from Lake Nyasa. It was first introduced to tropical aquarists about two years ago. It is rather retiring by nature but settles down well in an aquarium containing soft, neutral to slightly acid water maintained at a temperature range of about 72°F (22°C) to 78°F (26°C). The usual live and flesh foods are taken.

To settle an argument, please can you tell me whether any magazines devoted to the aquarium-keeping hobby were published in any country before the first World War?

German aquarists had their own magazines as far back as the 1890s, and 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.

I have just bought four young *Pterois labialis*. How can I distinguish males from females? Also, to what length does this fish grow?

At maturity, the male has more and brighter colour in the body and fins than the female. Ordinarily this species attains a length of about 4 in.

I should like to try and keep some *Parrot cichlids* in an outdoor pool this summer. Please tell me the best way to go about this.

First and foremost, wait until all danger of frost is past before you put the fish outdoors. Next, see that the temperature of the pool water is in the upper sixties or low seventies (°F) before you introduce the fish into their new environment. It would be advisable to place the fish in a basin of their own aquarium water and float this in the pool for a while to preclude any abrupt change of temperature. Make certain there is plenty of plant life at the surface to provide cover and lessen heat loss. If the pool is a small one it would be a good idea to cover it with transparent plastic sheeting at night.

My fishes in a thickly planted, long-established community tank are all I offer them and show no signs of disease (split fins, blebbiness on the body, and so forth), but they are becoming increasingly retiring and lacking in energy. What can be doing them?

In all probability they are suffering from a surplus of chemicals in the water. In a long-established aquarium there is a gradual build-up of salts and various chemicals dissolved out of the faeces of the fish, from dust in the atmosphere settling on the surface, from the compost and the like. If you siphon away about a quart of water right off the bottom every fortnight or so for the next three months and fill up with water from the tap, but matured, we believe you will soon see a great improvement in the look and behaviour of your fishes.

What size aquarium would you suggest for a single pair of *Stygopoma tuberculatum*? It is my intention to grow a pair on to a large size.

An aquarium measuring about 24 in. by 12 in. by 12 in. would prove satisfactory.

I have been told that there are several species of paradise fish (apart from *Micropodus opercularis*) native to southeast Asia. Have any of these fishes been imported and are they as attractive to look at and as easy to keep in the aquarium as the species mentioned above?

About five different species and sub-species and colour varieties of paradise fish are known to the serious tropical fishkeeper. Unfortunately, they do not come on the market very often. They are the spike-tailed paradise fish (*M. cupensis cupensis*), the brown spike-tailed or Day's paradise fish (*M. cupensis dayi*), the round-tailed paradise fish (*M. chinensis*), the black paradise fish (*M. opercularis concolor*), and the albino paradise fish—a man-made colour variant of the ordinary paradise fish (*M. opercularis*) developed in Germany in the 1930s. The black paradise fish is given to fits of spitefulness and anger; the rest are quite peaceful. None are so gaudily adorned as the common paradise fish, but all are pleasing to look at, long-lasting, tolerably easy to breed, and easy to feed.

I bought two framed tanks from a secondhand shop, but before I set them up I should like to make certain they are free from disease. What can I do to sterilize them?

Fill the tanks to their rims with water and then stir in sufficient crystals of permanganate of potash to colour the water deep purple. Leave the treated water to stand for several hours before emptying away. After a good swilling round with fresh water the tanks will be ready for use.

Coldwater fish-keeping answered by A. Boarder

How can I get that length and brighter colours? Ordinarily this

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hand shop, but certain they are

nd then stir in tank to colour water to stand After a good will be ready

I have two coldwater catfish in a large tank. One is 7 in. long and still growing and the other a little smaller. How are they doing? Can they be bred? What are their breeding habits and how large do they grow?

The European catfish, known as *Silurus glanis*, is one of the largest freshwater fishes of Europe. They are difficult to sex, the fatter belly of the female being the obvious sign; they could be bred but they would have to be of a fair size with plenty of swimming space. They lay their eggs on leaves and are believed to guard the eggs, at least the male fish does. They can grow to over thirty pounds in weight and prefer live foods, adult fishes eating mainly fishes, water fowl or small mammals.

I have some shubunkins in my pond which are suffering from white spot disease. If I empty half the water from the pond, catch up the fishes, will the water snails become hosts for the white spot parasites?

I do not think that you can get rid of the trouble with the aid of water snails. You will have to take the fishes from the pond and treat them as advised in previous issues of *The Aquarist*. By changing the fishes each day from one tank to a sterilized one you can clear away the pests.



Young free-swimming white-spot parasites (*Ichthyophthirius*). These occur in the water around an affected fish in large numbers.

My garden pool measures 24 x 20 x 4 ft., and contains goldfish, carp and eels. I find the carp have anchor worms. Can you please advise on treatment of fish and pool. Is there any fish I can introduce to control this pest?

I know of no fish which could control anchor worm, which is a crustacean. Neither is there anything you could put in the pond to kill the pests. The only way I know is to catch the infested fishes and pull the "worms" off with tweezers, then paint the wound with a strong disinfectant.

I have a tank, 24 x 12 in., with four goldfish. There is an under-water filter and the plants seem to have no life in them. The tank is lit by fluorescent light. Can you advise please?

The filter may be taking all the nourishment from the sediment which should have been utilized by the plants. Stop this filter for a time and see what happens. The type of lighting you use is not always satisfactory and some aquarists have done better by changing to ordinary filament lamps.

Could you tell me which is the best book on goldfish maintenance and breeding for a beginner?

Get the book from the *Aquarist* magazine entitled "Coldwater Fishkeeping". This will give you all the necessary information at a cheap price.

I have a garden pond which is infested with leeches. I have removed the fishes, and now want to know how to clear out the leeches?

As there are no fishes in the pond you should be able to trap the leeches. Get some pieces of meat, horse flesh from a pet shop will do, tie them on string and lower into the pond. After a couple of days examine first thing in the mornings and kill any leeches attached.

I have two goldfish in a tank which I think is of adequate size. The fishes have developed a whitish film over the body. It does not look like fungus. What is the trouble and how can it be cured?

The trouble appears to be what is known as velvet disease, *Oodinium*. It often affects fishes when the water has become impure or over-charged with minerals. Change the water and then do not feed at all for a week. Then only give live food. A bath in a salt solution for a few days would help. A tablespoonful of sea salt to a gallon of water is the rate.

I keep four golden and green tench with four goldfish in a tank 24 x 12 x 12 in. The tench have small white blotches on their bodies. What is the reason?

You do not say how large the fishes are. The tank should not have more than 12 in. of fish not including the tail and with such types as tench even this could be too heavily stocked. The water may need changing and then keep to a live food only diet for a time when things should improve.

I have been asked to look into the possibility of restocking the village pond. It is about 50 ft. in radius and appears to be no more than a foot deep. Can you give advice, please?

The first task will be to clear out much of the silt from the pond. Once this is done the true depth can be ascertained. Some under-water oxygenating plants can be added, such as *Ethalia canadensis*, *Egeria densa*, *Lagarosiphon major* and *Ceratophyllum demersum*. Not much of each need be used as they will soon spread. A water lily or two can be added and some plants to set near the edges, such as *Pontederia cordata*, *Sagittaria japonica* and rushes or reeds. All the water plants should grow well in a pond with a natural base and so too many need not be used. Once the plants are growing some fishes can be introduced. The best types will be common goldfish, orfe, golden rudd and golden or green tench.



Photo: W. J. Hovess
Green tench (*Tinca tinca*), a fish that is with good reason often recommended as a scavenger for ponds or coldwater aquaria.

Marine queries answered by T. Ravensdale

Can you suggest a place where I may be able to collect anemones around the South Coast?

The best spot I have found nearest to London is Black Rock, Brighton. There are a number of large rocks visible at low tide opposite the swimming pool.

How big does a puffer fish grow?

There are a considerable number of 'puffers' and 'blow-fish' on the market so it is difficult to answer this question at all but a few days ago I saw in the Antwerp public aquarium a 'puffer' (species unknown) a full 24 in. from nose to tail!

Can I use water from the North Wales Coast for my marine aquarium and is ordinary sand good enough for same?

Sea water from this area has a density of about 1.21 which is perfectly alright for invertebrates etc. but remember that density can change with temperature thus killing the smaller organisms and rendering the water impure. For this reason alone it seems false economy to use possibly foul water when perfectly good 'controllable' water can be obtained synthetically. Synthetic sea water is far cleaner than pure sea water. Ordinary sand is very doubtful in the marine aquaria and I would prefer to use silver sand, quartz, or better still, crushed coral. The last mentioned will of course help to stop acid build up in the water.

I wish to convert an ordinary iron-framed aquarium into a marine tank and have heard that there is a special paint on the market. Can you tell me the name of it and whether it is safe to paint the inside of the tank and the top with it?

I think the paint you have referred to must be poly-urethane based and the only one I personally know of is 'Diamond' paint. This is only available in white and costs 17/- per pint. It is not necessary to paint the inside of your aquarium at all. A tube of Hykro "Aquaesaler"

can be used to seal glass to glass joints and this will also keep the putty from contact with the water. The London Zoo Aquarium uses an epoxy resin paint for just the purpose and have had considerable success with it.

Can you recommend any books dealing specifically with marines?

"The Saltwater Aquarium In The Home" by Bob Stranghan is one of the best now available and I can also recommend "A guide to Marine Aquarium Keeping" by Peter Chlupaty at 6/-. Other books obtainable are "Marine Tropicals" by Braker at 32/6 and a "Guide to tropical Marine fishes" by Axelrod at 65/-. There is also a 3-T.F.H. publication called "Saltwater Fishes" which is quite good. A new German book by Wolfgang Wickler has now been translated into English by the London Zoo aquarium Curator, Dr. Gwynne Verera, priced at 10/6 and entitled "The Marine Aquarium." This book, I feel, offers the best value for money.

In your article 'Going Marine' I noted with interest that sea crabs can be kept in the freshwater aquarium. How can this be done and what is a safe size?

Marine crabs if less than 1 in. in size, can be slowly acclimatised to a freshwater aquarium in a matter of less than 2 weeks provided the change is made slowly. This can be done by keeping the crab in a tank half full of water taken from the sea and adding freshwater daily until the salt content is nil. He will eat anything but will prefer tubifex to all else. The temperature should also be raised slowly until it matches that of your community aquarium whereupon he may be placed safely in with fish. He will not attack fish if left alone but should be watched when he reaches a size beyond 2 in. A tight cover should be kept on well planted tanks as a crab is a remarkably good climber and will run up the leaf of a large plant like a monkey.

Continued from page 1

Cryptocoryne nevillei

Of all the genera of plants available to the tropical aquarium enthusiast, the genus *Cryptocoryne* probably contains more different species and, indeed, forms of species than any other genus. There are more than 50 species of the plant which are known, and a number of these appear in different forms. There is no doubt that there are still various species of *Cryptocoryne* that have not as yet been discovered, and due to the fact that various species assume different forms when grown under different conditions, there is still a lot of doubt about the correct names for given plants, even amongst dealers. It is only necessary to order plants of, say, *Cryptocoryne affinis* from one dealer, and plants of *Cryptocoryne "haerteliana"* from another dealer, to find that you have the same plant being sold under two different names. It's rather like buying rose bushes which are out of bloom and which have lost their labels. It takes an expert to be able to name any given plant of *Cryptocoryne*. Even with the aid of a well-illustrated text book it is most difficult to name a great many of the less common plants of this genus.

Fortunately, in the dwarf form of *Cryptocoryne nevillei*, although there may be some doubt as to its correct name,

we have a plant which is easily recognised by its size, shape and form. I have seen plants advertised for sale at prices ranging from 1s. 3d. to 3s., with one large dealer offering a "pygmy form" at 10s.

What's so special about the dwarf form of *C. nevillei*? In my opinion it's about the best foreground plant for the tropical aquarium. It's a slow growing plant which does not require any attention once it is planted. The leaves are a bright pale green in colour, those on my plants being about 1 in. in length by about $\frac{1}{2}$ in. wide. The leaves are borne on a petiole which is approximately 2 in. in length. This small plant does not carry a great number of leaves at once but those which it does have are kept for a very long time. Reproduction, which is slow, is by the production of new plants on stolons sent out by the adult plant.

Being a relatively small plant, the dwarf form of *C. nevillei* looks best when several plants are grouped together in patches in the front part of the aquarium. It can be planted in conjunction with some of the smaller species of *Echinodorus* or *Sagittaria*, but in water which may be too soft for plants of these genera, *C. nevillei* will survive, especially in shaded conditions where other plants will fail.

British bufonids and some others

by Eric Gillingham

BY the time that you are able to peruse these notes, it is extremely probable that the bathing-season of the British toads will be in full-swing.

Like the "common frog"—now, alas!, anything but common in many of its former haunts—the toads react to the stimulus offered by the first of the signs of the Zodiac—which is Aries the Ram, and they resort to the ponds and shallow lakes with that same apparent witless enthusiasm for astrology which is characteristic of many of the spellbound followers of the popular press; unfortunately these latter folk do not actually "jump in the lake!"

Be this as it may, the fact is that within ten days or so of the spawning of the common frog (*Rana temporaria*)—which event is controlled to some extent by the vicissitudes of our recalcitrant climate—the toads "take the plunge" sometime between the last two weeks of March and the first two of April, in accordance with the prevailing weather conditions.

Protocol seems to demand that the frogs take priority; but despite the fact that both often share the same sheet of water, it is noticeable that the actual deposition of spawn takes place in different localities, and that the growing tadpoles seldom intermix.

Toad tadpoles are readily distinguished from those of the frog by their sooty-black colour and their smaller size; they are also much more gregarious in the later stages of their development and are, of course, far easier to catch with a net than the relatively fast-swimming frog tadpoles; I am referring specifically to the well-grown larvae as both kinds are not at all mobile for some five or six days after hatching.

During most of the year, the prevailing imbalance between the sexes of the common toad (*Bufo bufo*) is readily overlooked but at this time one can scarcely fail to remark the large number of superfluous males. These are recognisable by their slender outlines, small size, light grey-buff colouring, and by the mere fact that most of them are single. Any female actually taken from the water at this time, will almost certainly be in amplexus with a successful male, or indeed, males—I have known healthy gravid females to perish miserably beneath a heaving mass of excited males, whose clinging-reflex is at this time so strongly marked that they will often pile on to one wretched female, or sometimes even on to one another, and half-a-dozen, obstinately refusing to relinquish their hold, can quite easily exhaust the more stoutly-built female, and in the end, she dies, it would seem, from drowning! I have seen this occur but in fairness to the actuarial analysis, it should perhaps be mentioned that the balance tends to be restored by the puzzling fact that literally scores of unattached males are found dead in the water every April. These pitiful cadavers are usually rather

emaciated in appearance but are otherwise totally undamaged; and here, surely, is something for the field-workers to get their teeth into—it seems to me not unlikely that this phenomenon is in some way related to the sea-changes which have been frequently observed to take place in developing toads, subsequent to metamorphosis, and often between the third and fourth years of life.

The common toad differs in some respects from several of its nearest relatives, in the possession of two oviducts which, naturally, give rise to double strings of gelatinously-coated black eggs, and the male and female both lack the sub-gular vocal- sac which is employed by some male bufonids in order to practise "singing". However, both sexes are able to produce a quiet croak which sounds somewhat like an embarrassed diner endeavouring to suppress an involuntary eructation. As far as Europe is concerned, the common toad is probably the most successful of all the anura. Except for the frigid areas of the extreme north, it ranges throughout the palaearctic region but it is surprisingly absent from Ireland, Corsica, Sardinia, and the Balearic Islands.

In the case of Ireland it is replaced by the Natterjack (*Bufo calamita*) which is to be found only in County Kerry in South-Western Ireland, but there seems to be a strong argument in favour of the supposition that this occurrence is the result of deliberate introduction by some unknown enthusiast.

Whilst we are dealing with the "rush toad", sometimes called "running toad", it would be as well to compare this lively little member of the genus *Bufo*, with some of its continental relatives. But first let us take a brief look at its distribution in modern England.

Nowadays, the Natterjack is largely a Midland and Western-County toad although formerly it was quite common in certain southern localities (it is still to be taken locally in Surrey and Sussex, but you must know the spots).

I possess a copy of a book published in 1839 from the pen of one Thomas Bell, F.R.S., entitled "British Reptiles", in which the author quotes the Natterjack as "common on Putney Heath" and "abundant on Blackheath and around Deptford"! Today, one would scarcely expect to encounter anything more entertaining than a few hundred pairs of veterans in these localities. However, it really is abundant in parts of Lancashire. I have secured more than a score on the Ainsdale golf course—just outside Southport, within the hour and I should mention that thereabouts the common toad is equally abundant.

Closely allied to the Natterjack, but not to be found in Britain, is the green toad (*Bufo viridis*) (see *The Aquarist*, March 1967). If you are in any doubt about the identity of any specimen caught on the continent (i.e. whether

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Natterjack or green toad) east of the river Rhine and anywhere from Southern Sweden to North Africa, have a good look at the undersides of the fore-legs: if the sub-articular tubercles at the conjunction of the digits on the feet are one single row, then the subject is a green toad—Natterjacks' tubercles are paired, that is to say they form two rows. Both these toads prefer to live in sandy surroundings and will thrive on a diet of almost any moving insects; once again do *not* rely exclusively on mealworms or indeed, upon any one particular dietary item.

Two more sand-loving toads that appear from time to time in the dealers' lists are the Moorish toad (sometimes called the panther toad (*Bufo Mauritanica*)) and the Abyssinian toad (*Bufo regularis*).

The former is from North-West Africa—Algiers to Morocco, and may easily reach 4 inches in length. The males have a well developed sub-gular vocal-sac, and are inclined to be noisy in the early part of the year.

This one may be distinguished from the rather similar Abyssinian toad by means of close observation—it lacks the tiny spines on the warty tubercles of the dorsal surface and (usually) lacks also the faint yellow median line running along the vertebral column. West African specimens of *B. regularis* are inclined to be much smaller than similar aged examples of the Moorish toad; but on the contrary, individuals of this species (*B. regularis*) from the Cape area occasionally run to five-and-a-half or even six inches.

Both these toads tend to reject large earthworms, and

Toad spawn festooned among water plant



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Rear view of toads in amplexus showing spawn being exuded

often adopt the defence-pose, standing with abdomen fully inflated and limbs straight up from the ground like props, and it seems to me that they fail to distinguish between large earthworms and snakes!

Of course, if you really care for the genus *Bufo*, the daddy of them all is, without doubt, the so-called marine toad (*B. marinus*) from the Neo-tropical region. Originally found from Mexico to the Argentine, it has now been introduced into Cuba and Florida, apparently because

Note double string of spawn



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despite its immense bulk, it is ready to consume mosquitoes!

It is strange, indeed, that this monster customarily hops when you would expect it to crawl, and seems to prefer small insects to larger prey. One that I kept, refused to have anything to do with mice—even little "pinkies", and subsisted entirely upon bluebottles, woodlice and meal-beetles (*Atelasia*) whereas a very large common toad from Southern Italy, measuring about four inches in length and weighing less than half of the marine toad's bulk, eagerly swallowed short-tailed field voles when ever the opportunity afforded. By the way, these giant toads from South America are coming on to the market more freely just now and if you are tempted to purchase one, please remember that those huge parotid glands are *functional*. Although the big toads soon settle down and seldom appear to resent handling, they do occasionally exude an extremely noxious, white sticky fluid from these prominent glands and if perchance you have a quite small cut or minor abrasion on your hands you will suffer accordingly. In these circumstances there is no danger of fatality, but there is the probability of acute and continuous discomfort, you have been warned!

A very common misconception regarding the nurture and culture of toads, is that the larger the subject the greater the area to be provided. Now this idea, at first sight more-or-less self-evident, can be completely misleading; it all depends upon the specific requirements of the creatures involved. For instance, most of the larger

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Natterjack toad
showing median
line on back



Bufo marinus—
grand daddy of
them all

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The fantail goldfish

by A. Boarder

THE fantail is one of the most useful fancy goldfish as it is suitable for the open pond as well as the indoor tank. In development it is midway between the ordinary common goldfish and the veiltail. The body is much deeper than that of the ordinary goldfish but not as deep as that of the veiltail. There is another difference in the caudal fin or tail. In the veiltail it is very full and drooping whereas in the fantail this feature is held horizontally, is smaller and more forked at the ends.

A good fantail should have an egg-shaped body, rather short and thick with an even curve over the top from the head to the tail. There should be no hump or snoutiness and a clean sweep over the back is essential. The lower curve of the body should also be in a clean line.

The dorsal fin should be more than half the depth of the body in height with the front edge evenly curved. The caudal fin is completely divided. This differs from the earlier standards when the caudal fin was only divided three-quarters of its length. The reason was stated to be that this ensured that the tail was held in a horizontal position. The ends of the caudal should be well forked. The anal fins are double and not overlong. The pectorals and pelvics are about equal in length to the height of the dorsal.

The scaled type should have all the scales clearly visible with a good sheen. The calico types to be free of visible scales with soft gill plates. The scaled type is preferable to the calico type as they are more hardy in an outdoor pond. The calico fantails often seen at shows appear to be undeveloped veiltails or throwouts from such strains. This similarity to a veiltail is most marked in the shape of the caudal fin, as instead of the tail being well forked it is often too straight at the ends, more rounded and inclined to be too large.

The minimum body length for exhibition is two inches and a good fish of such limits should beat a larger fish which was not such a good shape.

Under the present standards of the Federation of British Aquatic Societies the pointings are as follows: Type and colour, 40; fins, 20; body, 20; condition and deportment, 20. Under the old system the points were allotted as follows: Body, 30, scaled; 25 for calico; dorsal, 10 and 8 respectively; caudal, 25 in each; pectorals, 4 and 3; pelvics, 4 and 3; anals, 7 and 6; colour, 10 and 20; condition, 5 and deportment 5 each in both types.

It will be seen that in the former standards the body and caudal could get 55 points and 50, and I am sure that these extra points available for the distinguishing features are necessary. My own recommendations for judging the fantail are: Body, 25; caudal 25; dorsal, 10; pelvics, pectorals and anals, 15; colour, 15; condition, 10.

With these pointings it will be noted that the body and



caudal (the important features) have been rewarded and as I have stated before, deportment has been omitted deliberately as I consider that condition covers this aspect sufficiently.

To breed good fantails it is essential to start with as good a strain as is possible but this does not mean that it is imperative to use show fishes only. The more important fact is to make sure that the fishes are bred right. By this I mean having come from a good, well established strain. If a breeder has been using the same stock for many years it is quite probable that any fishes from this stock could breed very good fishes even though they themselves are not prize-winners. They are certain to carry the genes of inheritance and among their progeny it is probable that at least a few will be of good type. It is far more important to ensure that the breeders have a good strain behind them than to choose two fishes on their appearance ignoring their previous strain. I can give an example of this reason as follows: It is possible to cross a common goldfish and a fantail and among the youngsters to have at least a few quite good-looking fantails. Although such fishes could look good it is probable that they would never throw anything but a lot of runts, none of which would be worth the food they eat.

From this it must not be thought that all the youngsters from even prize-winning fishes would be of the perfect quality. It is a fact that when breeding any of the fancy goldfish the tendency to throw-back is very marked and if one could get 20 per cent. of the youngsters from a

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British bufonids and some others

Bufonids spend all day concealed in some chosen spot, emerging at night only for the purpose of satisfying their appetites and are well satisfied if they do not have to move far in order to do. On the other hand, many of the very active small members of the allied genera (particularly those such as the little discoglossid toads, which are almost completely aquatic in their behaviour—though they do not need much water—being well content with an inch or two) require upon the whole relatively greater areas to exploit.

Whenever you contemplate the purchase of imported specimens of any of the tailless batrachians, particularly of the larger toads, please examine the eyes and the nostrils closely. There are at least two kinds of parasitic flies which are accustomed to laying their eggs in the external orifices of the nostrils. The two most common offenders are *Lucilia bufonivora* and *Calliphora albivittata* both of which are to be found here but are much more commonly found on the mediterranean and North African terrains.

The attack results in the tiny maggots eating their way, via the internal nostril into the brain of the host and blindness is often a terminal feature, but a close scrutiny will reveal characteristic swellings on the top of the head and often the eyes are occluded completely; the prognosis

of any specimen so afflicted is grave indeed!

To the family Discoglossidae (note that despite their external appearances they are not Bufonids) we have already made a passing reference, and indeed for the adventurous beginner in vivarium-keeping, these very active little batrachians are an obvious temptation.

In the first place, they are nearly always available from dealers' lists, and secondly, they are relatively inexpensive.

The two which spring most readily to mind are the fire-bellied toad (*Bombina orientalis*) (formerly *B. ignea*) and the yellow-bellied toad (*B. variegata* formerly *Bombinator pachypus*). Both of these remain in, and around shallow water all their lives and for this reason alone make excellent vivarium tenants. They are easy to sex, as the male alone has the toes webbed right up to the tips; he also develops the usual dark, horn-like projections on the inside of the fore limbs.

In the case of the fire-bellied toad the male possesses an internal vocal-sac, and the throat inflates noticeably when he is calling.

With the yellow-bellied toad there is no vocal-sac—although, like the common toad he manages to croak, and during the mating-season the rough tubercles appear upon the third finger and also upon some of the toes.



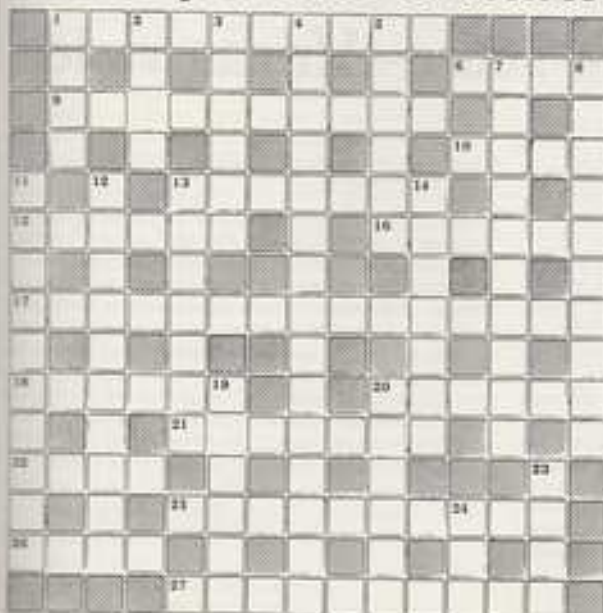
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the youngsters of the perfect y of the fancy r marked and givers from a

ed on page 22

The AQUARIST Crossword Compiled by L. BRADLEY



CLUES ACROSS

1. Produced in the artificial culture of infusoria (10).
2. Bird found in the crib is similar to the one that brings the baby (4).
3. Type of fish not reaching first or second place at the show (3, 5).
4. — of Noses (4).
5. Canned fish (7).
6. Fatness (6).
7. Spread out (8).
8. Far-west (7, 8).
9. Daughters of one's sister or brother (6).
10. Anesthetic that can be dose in one's head (8).
11. Proceed, removes quality and withdraws (7).
12. The guest to be found among nine (4).
13. Larva of the water beetle (5, 5).
14. Despite the heat change (4).
15. Put together again (10).

CLUES DOWN

1. Quietly change head gear and tread on it (4).
2. Artist in the wet (4).
3. Twelve noon (6).
4. Broom Carth (9, 6).
5. Not tied up (6).
6. Act a part bit (Latin slang) (5, 5).
7. Livabenters having weapons in their caudal fin (10).
8. Homoglosser mallice (6, 4).
9. Horns of Asahand Fry (6, 4).
10. Wicket keeper (7).
11. Breaches out (7).
12. Boyish (7 slang).
13. Courage (6).
14. Garnish (4).
15. Diminutive of large rock (3).

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Continued from page 20

The fantail goldfish

spawning to be up to standard there would be little to complain of. This variability in the fry only makes the breeding of such fishes more interesting as after all there is little skill required nor much satisfaction obtained when producing youngsters which turn out like peas in a pod on every occasion as is the case with those fishes which have not been altered by selective breeding.

When breeding fantails, one pair can be used and these fishes can breed at a year old if they have been well fed and grown. A two-year-old pair are a better proposition and there is no need to have more than one male to each female. This idea of always using a number of males to a female is not as important as some people would make out as the milk from one male could fertilise the eggs of dozens of female fishes.

The young of fantails can be sorted at an early age and with experience one can tell all those of the fry with single tails at only ten days old. At this stage the tail which appears from above as a spade-shape is the one to keep whilst the one which is quite thin is useless. When such fishes are viewed from above in a white bowl they can be sorted easily. At a later stage it is possible to observe the fry from a glass sided tank when body and dorsal shapes can be examined easily. Do not waste time, space and food on throw-outs but concentrate on rearing only

those fishes which appear to be as near the standards as possible. Not that it will be easy to make a final choice until the fry have grown on to become small fishes, and it may not be until they are a year old before one can be sure that they are developing on the right lines. With calico fishes their colours can be noted at an early age but with the scaled types it may take almost two years before the fishes take on their final colourings.

It has been written that the type of food given to young fantails can determine the shape of the body and that depth can be increased by such means. I do not agree with this as no matter what food is given to a fantail which has a natural shallow body nothing would make this structure deeper and if a young fantail is going to develop into a deep-bodied fish no matter what kind of food is given the final shape will not be altered.

Many young fantails have a joined or web-tail and such fishes could breed fry with divided tails providing they have come from a good strain. Among a batch of youngsters some may be found with web-tails, tri-tails and single tails. The proportion of misshapen fishes in one brood may not equal a further one and just because a pair of fishes have not produced a large proportion of good fishes at one spawning it does not signify that the following spawning will be as bad.

Plants in the fish house—African violet

by Barry R. James

AFRICAN violets are indigenous to the Tanganyika province of East Africa. Here, only 8 degrees from the equator, the climate is truly tropical with heavy thunderstorms alternating with blazing sunshine to produce a hot humid atmosphere. The temperature varies only slightly between day and night and from hot to warm seasons in the valleys which are the home of African violets. The plants tend to grow on the rocky ledges on the lower slopes of the Usambara mountains, but may be found up to 6,000 feet.

The leaves of the various species (for there are more than one) grow from a central stubby stem. Generally speaking, they are oval with a slightly pointed end and grey-green in colour. Both upper and lower surfaces are covered with fine hairs and the edges are often toothed or notched. Many varieties are now in cultivation, some with monstrously twisted leaves and multi-petalled flowers, but I shall content myself with the varieties commercially grown, and which may be obtained quite readily through local nurseries and florists' shops.

The charm of this little plant lies in the multitude of

flowers which it produces at intervals, several times a year. These may be light blue, dark blue, purple, pink and white, often with yellow centres. Double-flowered species are also quite common and in the same range of colours. The flower spikes arise from the central stem and produce a dozen or so flowers on a single head. In addition there may be half a dozen or more spikes in bloom at the same time on a single plant, making it literally a mass of flowers. Coupled with the perennial nature of this species the result has been an ever-growing popularity, especially in the United States, where with coupled central heating and air conditioning, ideal conditions for *Saintpaulia*, even the novice housewife with no knowledge of the care of growing plants has been able to rear them successfully.

In this country with our cold draughty houses, however, winter usually terminates the lifespan of most specimens prematurely, with the result that it is usually treated as an

Continued on page 23

THE AQUARIST

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By D. E. S.

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Some less common livebearers

by D. E. Sale

As knowledge of the breeding requirements of egg-laying fish has increased, an ever-growing number of aquarists has turned away from some of the liveliest, best-behaved and hardiest of tropical fish, the *Poeciliidae*. Of this family, only guppies, platies, mollies and swordtails are at all common today, but there are several other species well worth keeping if only for their perky behaviour and sociable disposition.

One fish I have searched for in vain is the Merry Widow (*Phalloichthys amata*). These lively fish are not brightly coloured although the male has a black and white border on his large dorsal, and his sides are attractively barred. Merry Widows are very peaceful and accept all foods readily. Moreover, they are not at all shy and love to swim in their sprightly fashion at the front of the aquarium. They breed readily and usually the strongest and most alert fry escape the jaws of the adults. If the gravid female is trapped, 30 to 50 young are usually obtained.

The Blue Limia (*Limia melanogaster*) has also become rare. Blue is not a common colour among tropicals so the fall from popularity of these fish is difficult to explain. Both sexes have shining blue scales and the male has a black-bordered dorsal fin.

The closely related Striped-Limia (*Limia nigrofasciata*) has, as its name suggests, black bars on a dull gold background. They are strong-looking, deep-bodied fish and this fact, with the large dorsal fin of the male, has earned them the alternative name of Humped-backed Limia.

Limias are rather cannibalistic so a breeding trap is advisable. About 20 young are produced in each brood.

Glyptothorax falcatus, which for some reason has never been popular enough to have a common name, is another pretty little fish, golden in colour with a startling blue eye. Again this fish is cannibalistic but broods are larger, up to 50 young being produced.

All the above range in length from about one-and-a-half inches for the male to two-and-a-quarter for the female and are therefore ideally suited to the community tank. The last fish in my list of missing favourites, the Mosquito Fish (*Heterandria formosa*), is so small that it really needs a tank to itself. A full-grown female is about the size of a male guppy; a male is well under an inch long. They are attractively marked in brown with a horizontal stripe when adult, and vertical bars when young. For fish so small they have remarkable energy and an even more remarkable temper; two males or two females often threaten each other and squabble for a few seconds, but nearly always with no harm done. Young mosquito fish are delivered over a period of a few days and most of them seem to escape. Only hungry mosquitoes will eat their young ones, on the other hand, they will eat almost anything else. Mine never fail to amuse me by their habit of stalking large snails, waiting for the horns to appear.

A few other livebearers appear from time to time, notably

the attractive but anti-social *Gambusia affinis* which is best avoided, and the half-beaks from the family Hemirhamphidae. These strange fish are real oddities. Long and slender, they lurk just below the surface so that in a well-filled aquarium they are rarely seen. If kept on their own and fed with mainly live foods, especially tiny flies dropped on the surface, they are very entertaining with their long protruding lower jaws and their stealthy approach to, and final quick dart upon, anything moving, including their own young.

If anyone who has never kept any of these species (*Gambusia affinis* excepted) is fortunate enough to obtain any, he will find them most interesting, attractive and lively additions to his collection.

Continued from page 22

African violet

annual. The aquarist with a heated fish house, or with a row of tanks constantly giving off warm humid air by evaporation, should have the same success as our American friends.

Generally speaking the needs of Saintpaulias are few: a fairly constant temperature which remains above 55°F (13°C), a draught-free position out of direct sunlight, a moist soil and feeding once a week. Dead flowers should be removed to prevent the plant looking untidy and no moisture should be allowed to remain on the leaves or become stagnant around the base of the stems, or they will become attacked by fungus and rot away.

Propagation is by seed or leaf cuttings, generally the latter. To strike leaf cuttings they should be severed with a razor blade as close to the main stem as possible and the veins should be slit at intervals along their length. Hormone powder dusted liberally on the underside of the leaf and stem will produce faster rooting. The leaf should then be placed in a flower pot (or a seed tray if a number of cuttings are taken) and laid face up on the surface of the soil. They should then be pegged down with tiny wire stakes so that even contact is made with the ground. The soil should then be well damped and the container covered with a sheet of glass. If it is placed in a warm sunny position roots should be produced literally within a few weeks, along with the first leaves of the baby plants. When of sufficient size they need to be potted up separately in 3½ in. pots. The soil should be the usual John Innes potting compost no. 2 with a liberal amount of extra leaf mould added to increase the humus content.

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The chief prizewinners were: Total highest points Mr. T. Summers, 60 points; second being Mr. D. Boynton with 52 points, and third Mr. D. Towell 41 points. The plaque for best fish exhibitor went to Mr. J. Peters, and Mr. Fitzmaurice won the breeders live-bearers class. Home Furnished Aquaria: 1. Mr. Parker; 2. Mr. Thompson; 3. Mr. Forder. The prize for the pairs class went to Mr. McKean. It is proposed to collect a number of colour slides of members' fish so that they may be shown at future club meetings, which should be useful as a guide regarding the merits of the various fish.

THE Hornsea and District A.S. are still entering a very successful year which has culminated in their winning the A.S.L.A.S. Knockout Trophy for the second year running. The final with the Kingston and District A.S. held in January was a very lively affair which resulted in a win for Hornsea by 840 points to 834. 1. Mr. R. Biggs (Kingston) Rednose 78 points; 2. Mr. D. Woodward (Hornsea) Checker Blue 74 points; 3. Miss F. Greenhalf (Kingston) Play Varieties 73 points; 4. Mr. D. Love (Hornsea) Combed 73 points.

During the evening an interesting talk on various aspects of the hobby was given by the Chairman of A.S.L.A.S., Mr. John Thomas and after a break for refreshment Mr. Dave Ellis of the Kingston club conducted an auction of surplus tanks.

The results of the Table Show in January in A.O.V. Tropical fish were as follows: 1. Keith Mason (Red-Tail Shark) 79 points; 2. Keith Mason (Red-Tail Shark) 78 points; 3. Christopher Bunce (Javanese) 77 points. The Table Show on 19th February was for Landmarks and these results were: 1. Dave Love (Lace) 82 points; 2. Dave Love (Lace) 81 points; 3. John Thayer (Moss) 81 points; 4. Mrs. Burser (Kissing Gourami) 78 points.

The next major social function is the April Fish Dance on 1st April, 1967. Tickets are available price 6s. 6d. from Bob Williams of 13, Harding Avenue, Feltham, Middlesex, and urgent parties from other Aquarist Societies will be especially welcome.

A BREAK from tradition was made this year by the Newport A.S. in that the usual formal annual dinner was not held. In its place a social evening and buffet was held at the Snow-Pack Hotel, Newport, visitors from other societies in South Wales being present in large numbers. Notable guests included Mr. Brian Light (chairman, Barry A.S.), Mr. R. Dennis Jones (secretary, Barry A.S.), Mr. Richard Wigg (secretary, Llanelli Major A.S.), Mr. Sam Sney (former chairman, Federation of Guppy Breeders' Societies, South Wales section) and Mr. Gerald Jennings (show secretary, Marine Study Aquatic Society of Great Britain).

Guest speaker at the Society's February meeting was Mr. Arthur Contrill, a young school-leaver who had recently returned from service with Voluntary Service Overseas in West Africa. His subject "Fish Husbandry in Sierra Leone" was enthusiastically received by a large and attentive audience which included many new members. In a 90 minute address Mr. Contrill spoke on the constructing of two fish farms in Sierra Leone, intended as a solution to the problem of a nutrition deficiency in the country, and capovated his audience with many interesting anecdotes.

Local enthusiasts are reminded that meetings of the Society are held on the first Tuesday of each month at the R.A.O.B. Club, Snow Hill, Newport, commencing 8 p.m. Further details are obtainable from the secretary, Mr. I. G. Phillips, 34 Swanwyn Crescent, St. Julian's, Newport, Mon.

THE last meeting in January of the Hull Aquarist Society was a full night's entertainment. A film was shown by Mr. Johnston about life in Australia. There were some very good shots of marine life and tropical fish and birds. This was followed by a slide show of tropical fish.

The A.Y.A.S. have given Hull the privilege of staging their Open Show on 3rd April at the Railway Institute, Anlaby Road, Hull. A talk was given to beginners at the last February meeting by Mr. Revelly, the object being to help new members to make a correct start in purchasing equipment and fish. Later in the evening Mr. Revelly gave a talk about judging to the trainer judges. The second meeting in February was taken up by a panel composed of Mr. P. Chapman, Mr. W. Hall and Mr. Revelly to answer questions on the breeding and rearing of different types of fish. The knowledge and help from these members was very much appreciated by all present.

THERE was a "Judge-yourself" fish show at the Worthing Tropical Fish Club's meeting. Results were: 1. Mr. E. Cox with a Lace Gourami; 2. Miss L. Ormrod with an Angelfish; 3. Miss H. Scott with a Guppy. A short talk on choosing fish for a show was given afterwards by Mr. P. Waring.

To Club Secretaries

It is the intention of the Proprietors of "The Aquarist" to make an award for the Best Fish in the Show at the Open Shows this year.

In order to put this Scheme into operation and to include as many Clubs as possible, it would be appreciated if Secretaries would send into us the date of their show by return of post. Open table shows and inter-club shows are not eligible and further details with rules will be published shortly.

AT the first annual general meeting of the Eastbourne Aquarium Society the following committee were elected: President, M. Saunders; Vice President, E. Meredith; Treasurer, M. Robinson; Secretary, C. George; Show Secretary, B. Rogers; A. Clark and J. Lane. The President's report on the first twelve months progress of the Society was very encouraging with twenty-two paid up members and several other Aquarists keen to join.

The main item discussed which received full support was the Society's plan to take over the local public aquarium The Blue Grotto, which consists sixteen aquariae the largest being 12 ft. x 8 ft., and some of the problems that this venture would bring, also the conversion and decoration of the Club's new meeting room supplied by the management of The Blue Grotto. It is hoped that with keen aquarists running the Aquarist it will be a great draw to all visiting fishkeepers and the Society hopes to put on a really fine display of outdoor, tropical and marine fishes, and also run Aquarist Study classes for the local schools. Any local fishkeepers who would like to join the Society will be assured of a very warm welcome at the twice monthly meetings, and further information can be obtained from the Secretary, C. George, 6 Hart Road, Eastbourne.

FROM Nottingham and District A.S. we understand that Mr. H. Lyson is still far from well although he is convalescing at home. There is also a good report and description of the Calverton Trout Farm which was visited recently by the Society. The table show for White Clouds resulted in Miss Helen Goodlife gaining the first three places.

THE January/February issue of the York and District A.S. monthly newsletter contains a varied selection of fishkeeping topics and the chairman's and secretary's reports on the past year. Both of these are informative and report excellent progress. The table show results were as follows:

Open Class (Landbearers): 1. Mr. Pignat (Yellow Wagtail Platy); 2. Mr. Cooper (Black Swordtail); 3. Mr. Parlebone (Green Swordtail); 4. Mr. Gray P. (Red Swordtail). Novice Class (Any Variety Angelfish): 1. Mr. Dearing (Corydoras Amazon); 2. Mr. Gary P. (Clayfish); 3. Mr. Flower (Three Spot Gourami); 4. Mr. Dearing (Paradise fish).

THE Dudley and District A.S. show results in February were as follows: True Pairs Egg-layers Experimentally: 1. J. Vickery (Yellow Redstart) 72 pts.; 2. N. Newman (Orange Grouse) 70 pts.; 3. G. Rothbar (Kestrel) 68 pts. True Pairs Livebearers (Experimented): 1. G. Rothbar (Yellow Mollie) 77 pts.; 2. Mrs. Graft (Turquoise Swords) 72 pts.; 3. D. Pratt (Green Swords) 68 pts. True Pairs Egg-layers (Novice): 1. Mr. Bond (Dwarf Goby) 70 pts.; 2. Miss J. Hall (Stone Tern) 68 pts.; 3. Miss S. Hall (Bluebird Goby) 66 pts. True Pairs Livebearers (Novice): 1. R. Newman (Red Swords) 72 pts.; 2. Mrs. G. Smith (Red Swords) 72 pts.; 3. R. Dickson (Red Swords) 71 pts. The Special for the experimental was won by Mr. G. Rothbar. The Special for the novice class was won by Mr. R. Newman.

THE table show at the Bradford and District A.S. monthly meeting resulted as follows: Livebearers: 1. Master J. Brown; 2. Mr. B. Smith; 3. Mr. D. Patrick. A.O.V.: 1. Mr. A. Hensley; 2. Mr. K. Williams; 3. Mr. G. Orchard. Recent speakers have been Mr. H. Fisher and Mr. Laurie Haley.

NEWS from the Alreborough and District A.S. monthly bulletin includes a lengthy list of new members and a number of interesting articles. Mention is also made of a new club in which is now available to members.

THE annual general meeting of the Goodfield and District A.S. was held in February at the British Legion Hall, Quarry Street, when the following officers were elected: Chairman, Mr. Aylton; Secretary, Mr. D. Nightingale; Treasurer, Mr. L. Baxall. The committee is as follows: Chairman, Mr. Aylton; Treasurer, Mr. L. Baxall; Hon. Secretary, Mr. D. Nightingale; and Mr. P. Lee, Mr. E. G. Vernon, Mrs. Everett. Anyone living in the Goodfield area who is interested in the Society please contact Mr. D. Nightingale, of 57a, Gt. Gaudern Drive, Busby Hill, Marnes.

THE Table Show at the monthly meeting of the Regent Society, Derby, attracted a good entry especially in the Novice Class, also the first round of the Guppy Cup was decided. A game of Fish Bridge was played during the evening and was quite successful. The Annual Show this year is to be held on 7th May, any details may be obtained from the Show Secretary, Mr. A. Widdowson, 19 Finchley Avenue, Mackworth Estate, Derby.

A JUDGES instruction course is being held by the Midland Association of Aquarist Societies. This will be open to all aquarists and full details will be announced later.

OBITUARY

IT is with deep regret we announce the death of Jim Edwards a member of the Midland Aquarium and Pool Society, and Show Secretary for the Midland Open Show for a number of years. He passed away on the 24th February, aged 57 years.

THE results of recent table shows at the Dundee A.S. were as follows: Scott Trophy (Platy): 1. W. Cairns; 2. D. Parry; 3. S. D. Gould; 4. D. Parry. (Sword): 1. D. Toews; 2. G. Reid; 3. R. N. Crabb; 4. S. D. Gould. Junior Trophy (Platy): 1 and 3. D. Parry; 2 and 4. S. D. Gould. (Sword): 1. S. D. Gould. The programme at the February meeting took the form of a tape-slide lecture

from the British Killifish Association on the subject of Fish House construction. The talk went down very well indeed and at the close there was lively discussion and not a little rivalry in the fish-house illustrated.

The annual prize-giving of the **Heighon & Southern Aquarist Society** was held on the 15th February, and the awards, presented by Mr. H. W. Davis, were as follows: Table Shows (Championship): J. E. Cummings 493 points; J. J. Coleman 471 points; J. R. Browning 459 points. Best Fish of the Year: E. Cummings. Best Bryon Trophy—Parrotfish for Competition: R. Browning. Novices Cup: J. Bishop. Ladies' Trophy: Lee Coleman. David Harris Trophy for Best Guppy: J. Phillips. Home Furnished Aquaria: Class A, Ross Jones; Class B, Browning; Class C, P. Woodham; Class D, Rectangular Tanks: J. E. Farrell; J. Papp Carr; J. L. Watters; A. J. Bishop. A welcome was given to a former member Mr. John Kaij who gave a talk on breeding Loach (Gomphos) and Polydora pristinax. On 1st March a table show for Characins was held and Mr. "Jack" Stewart was the judge on this occasion. Mr. P. E. Parry gave a talk comparing wild and aquarium fishes and stressed the need to imitate wild conditions in breeding tanks.

The Manchester Section of the **Fancy Guppy Association** held their monthly meeting on the first Sunday in March at the Langhale Hotel, Belle Vue, Manchester when a Lecture was given by Mr. R. Barnford on Fish Photography and was very well demonstrated by slides. Also the usual table show was held and a gold medal awarded for best in show. Anyone interested in Guppy breeding will be welcome to any of the regular meetings which are always held on the first Sunday in the month at the Langhale Hotel, Belle Vue, Manchester, commencing 2.30 p.m.

At the Annual General Meeting of the **Workshop Aquarist and Zoological Society**, the new committee elected were: President, Mr. W. Kirk; Chairman, Mr. G. Simon; Secretary, Mrs. J. Dornie 189, Sparkes Hill, Workshop, tel. Workop 2975; Treasurer, Mr. J. Dwyer, Show Secretary, Mr. S. Knowles. The activities for the Society for 1967 were discussed in detail and arrangements are being made for Table Shows, Slide Shows, Lectures, visits to places of interest and inter-society shows, etc.

A very successful Table Show was held at the March meeting, the results being as follows: A.O.V.: 1 and 2, Mr. A. Mawson; A. Mr. and Mrs. J. Dwyer, Catfish and Loach: 1 and 2, Mr. A. Mawson; J. Mr. Bennett, Large Goldfish: 1, Mr. and Mrs. J. Dornie; 2, Mr. Bennett; 3, Mr. and Mrs. Maycock; Fishes: 1, 2 and 3, Mr. A. Mawson.

NEW SOCIETIES

ON the 17th January an inaugural meeting was called at Swanscombe Community Hall, Milton Road, Swanscombe to form the **North Kent Aquarist Society**. The meeting was attended by 37 enthusiastic aquarists and the following committee was elected: Chairman, T. Flint; Secretary, Mrs. B. Hunter; Assistant Secretary, Miss M. Kent; Treasurer, Mr. C. Hunter; Committee, Mr. A. Rowell, Mr. R. Hurd. It was decided that meetings would be held every other Tuesday. Information about joining the society may be obtained from the Secretary at 80 Stanhope Road, Swanscombe, Kent.

The **Cornbrook & District A.S.** has recently been formed and has attracted members from all over the Greater Manchester Area. Meetings are held every second and fourth Tuesday of the month and enquiries for membership details will be welcomed by the Secretary, Mr. G. G. Holden, 65 Snowden Avenue, Plattin, Near Manchester. Secretaries of other Societies are invited to send details of their next open show, as enthusiastic support will be given.

A NEW society has been formed and is known as the **Bedworth Aquarist and Pond Society**. Meetings are held at the "Travelers Rest", Buckingham Lane, Bedworth, at 8 p.m. every third Friday.

At the inaugural meeting the following committee was elected: President, Mr. R. Mayer; Chairman, Mr. K. Jones; Vice-Chairman, Mrs. M. Simpson; Secretary, Mr. P. Davies, 47 Mill Farm Cottages 35th, Marston, Leicestershire; Near Nuneaton; Assistant Secretary, Mr. W. Brimley; Treasurer, Mr. R. Zedde; Show Secretary, Mr. B. Scully; Assistant Show Secretary, Mr. J. Vaughan; Librarian, Mr. H. Goodless; Publicity Officer, Mr. R. Shakespeare; Mr. D. Thompson; Mrs. B. Scully; Mr. F. Simpson; Mr. J. Rowson. The Society has had the Slide lecture "Setting up an Aquarium" and "33 Aquaria Plans", kindly loaned by Trapsy A.S. The next meeting is a lecture on breeding Live-bearers.

The membership is in excess of fifty and an invitation is extended to all fishkeepers in Bedworth and District to join the Society.

AQUARISTS' CALENDAR

- 2nd April: Bradford and District A.S. Open Table Show, Unity Hall, Ransome Square, Bradford.
- 2nd April: Valley A.S. First Open Show, Civic Hall, Ramothorpe.
- 3rd April: A.V.A.S. open show staged by Hull A.S. at the Halcyon Institute, Anlaby Road, Hull.
- 14th April: Middleborough and District A.S. Open Show, Berrick Hills Community Centre, Middleborough.
- 22nd April: Edmonstone Section, Fancy Guppy Association Spring Open, Rowantree School, Edinburg.
- 23rd April (Provisional Date): Sheffield and District A.S. Open Show at the Moorbrook Vaux Hall, Moorbrook Park Road, Hestley, Sheffield.
- 25th April: Bath A.S. Open Annual Show, The Weston Hotel, Bath. Details from R. H. Farnon, 3 Oak Avenue, Englishcombe Road, Bath.
- 6th May: Trurobridge and District A.S. Annual Open Show at Newton Junior School, Trurobridge. Details from Mrs. P. Parson, 69 Alford Street, Westbury, Wiltshire.
- 7th May: Regent Society Derby Annual Show. Details are available from Show Secretary, Mr. A. Widdowson, 19 Finchley Avenue, Mackwood Estate, Derby.
- 7th May: Orem A.S. Open Table Show.
- 7th May: Leigh A.S. Open Show, Leigh Rugby Union Club, Birch Walk, Pennington, Leigh.
- 12th May: Frinton A.S. Second Open Show at the London School of Printing, Elephant and Castle, London, S.E.1. Schedules available from Show Secretary, Mr. A. Howes, 28 Rulien Street, Catford, London, S.E.8.
- 14th May: Workshop Aquarist and Zoological Society, Third Annual Open Show, Vernal-Kilroy Vaux Club, Milton Hill, Workop.
- 14th May: Annual Convention of the Midland Association of Aquarist Societies, Lockhead Hydraulics Ltd., Works Centre, Loughborough Spa.
- 21st May: Maidstone T.F.S. Second Annual Open Show. Schedules available from Mr. H. Brown, 5 Clough Bank, Maidstone, Kent.
- 3rd June: Catford A.S. Open Show. Full details from Show Secretary, Mr. R. D. Dorn, 42, Elmor Road, Catford, London, S.E.8.
- 10th June: Latham A.S. Open Show at Louisa Pavilion, Latham.
- 17th June: Uxbridge and District A.S. Open Show. Venue to be announced later.
- 17th June: Brighton and Southern A.S. Annual Open Show at The Raffle Hall, Hove. Enquiries to Mr. Roy Browning, 34 Roman Court, Ferringdale, Sussex.
- 18th June: Gosport A.S. Open Show. Secretary, Mr. John Ingram, 37 Charleston Road, Gosport, Durbyslow.
- 25th June: District and District A.S. Open Show at Volant Labour Club. Schedules from Mr. P. Turkey, 2 Murrells Close, Dilton.

- 25th June: Skipton and District A.S. Open Show.
- 1st July: Hutton Grammar School A.S. Annual Open Show. Enquiries specially invited from Junior Sections and School Aquarist Societies. Show Secretary, Mr. D. J. Radcliffe, "Kanda," Todd Lane Smith, Louth, Leicestershire.
- 2nd July: Loughborough and District A.S. Second Open Show.
- 7th-12th August: Portsmouth A.S. Open Show.
- 26th-27th August: Orem A.S. Annual two-day Show.
- 2nd September: High Wycombe A.D. Annual Open Show at the Eye, High Wycombe. This will include a Guppy Show staged by the Three Counties section of the F.G.B.S. to be judged under their rules. Details for both sections from Mr. C. Pike, 18 Ashley Drive, Tylor Green, Penn, Bucks.
- 2nd September: York and District A.S. First Open Table Show. Schedules from Show Secretary, Mr. J. R. Powell, 111 Chalkhill Court Road, York, Glou.
- 3rd September: Reigate and Redhill A.S. First Open Show. Secretary (Show), Mr. E. Bass, 2 Canine House, Beech Road, Reigate, Surrey.
- 10th September: Huddersfield Tropical Fish Society. Fish Open Show. Secretary, Mr. L. Kaye & Tottier, Hamforth, Huddersfield.
- 10th September: Newport A.S. Annual Open Show, Stone Hill Secondary School, Newport (to be confirmed). Show Secretary, Mr. M. J. Parry, 45 Western Drive, Gosholt, Cardiff.
- 23rd September: Brecknell & District A.S. Open Show, Victoria Hall, Brecknell, Berks. All available details from Show Secretary, Mr. B. Johnson, 18 Highfield Chase, Cove, Farnborough, Hants.
- 28th September: Blackpool and Fylde A.S. Open Show at Harrowdale Restaurant, South Promenade, Blackpool.
- 7th October: Mid-Herts. A.S. Open Show at St. Paul's Church Hall, St. Albans.
- 28th-29th October: British Aquarists' Festival, Belle Vue Zoological Gardens, Manchester. Details from Mr. G. W. Cooks, Spring Green, Field Hill, Batley, Yorks.
- 25th November: Put, Farnham and Aquaria Show organised by the Borough Council of the London Borough of Hackney, King's Hall, Lower Clapton Road, E.8.
- 2nd December: Leeds and District A.S. Open Day Show.
- 2nd December: Aireborough & District A.S. Annual Open Show.

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