

The Aquarist

and Pondkeeper

MAY 1965



MONTHLY
Vol. XXX No. 2

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GOLDFISH AND SHUBUNKINS	2-3" 1/6
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KISSI	4/6
CALICO COMETS	4/6
RED FANTAILS	4/6
GREEN TENCH	3/6 and 5/-
GOLDEN ORFE	3/-
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MINIMUM ORDER £2
PLUS TEL. CARRIAGE, PACKING, ETC.

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4' x 2' 8" x 12"	£8 17 4
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FORMAL RECTANGULAR POOLS—

7' x 3' 6" x 14"	£25 14 0
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WINGLESS FRUIT FLIES CULTURE	7/6
GRINDAL WORM CULTURE	2/-
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WHITE WORM, 1 oz.	8/-

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For the first time an aquarium filter has been developed which gives perfect filtration for freshwater or sea-water aquariums.

The high circulation rate of this filter is of great value in the keeping of many types of freshwater and marine fishes.

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There are special filter mediums for freshwater or sea-water aquariums as required.

Single pump unit will filter up to 30 gallon Aquarium. Double pump unit will filter over 30 — 100 gallons.

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POSTAL SERVICE



TROPICAL FISH

Interesting fish this month

Hills Flaty Varietas AS 15/- 8 pair
 12" Veilera Mollies AS 30/- pair
 Adult Cardinals (each)
 (white) ... 12/4 each
 King Size Neons ... 5/6
 Orange Chromides ... 8/4
 Cross Large 8" ... 22/2 10/8 pr
 Discus 3" ... 45/9 9 ea.

Prochilodus Ingrams 2" 30/- each
 Prochilodus Tassiarurus 2" 30/- each
 Black Veiled Angels ... 9/4
 Snake Heads 2" ... 15/-
 Catalina Tetras (New) 12/6
 Flaty Varietas 7/4 pair
 Large Tail Fin Black Mollies ... 27/4

Black Body Red Veil Guppies (Genuine Virgin Females) 95/- pair
 Red Wagtail Swords 12/4
 Flaty Varietas 17/4
 Golden Guppies ... 4/-
 Red Swords ... 12/4
 Ananostomus Anomalus ... 27/4 each
 Povernars Headstanders ... 12/4

Bleeding Hearts ... 12/8 each
 Corydoras Elegans ... 12/4
 Corydoras Rabauti Adult ... 12/4
 Electric Catfish ... 30/-
 Reed Fish 12" ... 42/-
 Medium Tiger Barbs ... 5/4
 Black Cardinals ... 7/4
 Walcotts Cods ... 12/4
 Shearfin Nones ... 35/-
 Simpson Red Wagtail ... 12/4

TROPICAL FISH LIST MAR/APRIL REGULAR STOCKS ARRIVING WEEKLY

LIVEBEARERS		HUCKEY STICKS		BARBS		LACE VEILTAIL	
Guppies	Fancy ... 12/6 pair	Black Neon ... 5/-	Tiger ... 2/6 each	Lace Veiltail ... 7/4 each	Veil ... 7/4	Black ... 4/4	Black Veil ... 10/-
	Assorted ... 2/-	Parrotfish (Buckfish) ... 4/4	Higger (adult full col.) ... 7/4		Tico ... 2/4	Jewel ... 4/4	
	Lace Guppies ... 4/-	Marble Hatchers ... 7/4			Cherry ... 2/4	Claviers ... 2/4	
Swordtails	Red Standard ... 2/4 each	Nannostomus ... 4/-			Higger (Small) ... 2/4	Peavie ... 4/4	
	Red Large ... 3/4	Nannostomus Anomalus ... 5/-			Twister ... 17/4	Marble ... 7/4	
	Green ... 2/4	Trilostatus ... 8/4			Topail ... 5/-	Firemouth ... 3/7	
	Albino ... 3/4	Copina Arnoldi ... 7/-			Boop ... 2/4		
	Red Wagtail ... 2/4	Copina Guttaria ... 3/4			Half Banded ... 3/4		
	Tasado ... 2/4	Moenkhausia Picta ... 5/4			Golden ... 2/4		
	Red Eye Red ... 4/4	Red Eye Characin ... 21/-			Clown ... 2/4		
	Golden ... 4/4				Arlequin ... 4/-		
	Simpson Reds ... 12/4 pair				Vivatus ... 4/-		
	Green Crystal Mollies 7/4 each				Barbus Gelius ... 5/4		
	Leopard Guppies ... 15/- pair						
Platies	Red ... 3/- each						
	Black ... 2/-						
	Tasado ... 2/-						
	Comet Tail Yellow ... 2/-						
	Red Wagtail ... 2/-						
	Yellow Wagtails ... 2/-						
	Lemon ... 2/-						
	Varietas ... 7/4 pair						
Mollies	Black Lyntail ... 5/- each						
	Black ... 2/-						
	Mosaic Fish ... 2/4						
	Hill Beaks ... 2/4						
CHARACINS							
Tetras	Glowlight ... 3/4 each						
	Neon ... 2/4						
	Neon ... six for 17/4						
	Red Fin ... 2/4 each						
	Flame ... 4/4						
	Cardinal ... 4/4						
	Red Eye ... 4/4						
	Lemon ... 4/4						
	Black Line ... 2/4						
	Tarpas ... 2/-						
	Feather Fins ... 2/4						
	X-Ray Fish ... 2/4						
	Roseate ... 4/4						
	Beacons ... 2/4						
	Swordtail Characin ... 4/-						
	Black Widows ... 2/4						
	Belgian Flats ... 4/4						
	Alouise Longfins ... 4/4						
	Paraguay Tetras ... 4/4						
PANACHAX GROUP							
Panache	Daini ... 4/- each						
	Linnet ... 4/4						
	Chaper Orange ... 4/-						
	Throat ... 4/-						
	Playful ... 4/4						
Aphosemian	Vegetarian ... 19/4 pair						
	Californian ... 14/4						
	Callitricum Large ... 14/-						
	Arnoldi ... 14/-						
RASBORAS							
	Harlequin ... 2/4 each						
	Forest Rasboras ... 4/4						
	Scissor Tails ... 2/4						
	Rasbora Kalechrems ... 7/4						
	Rasbora Doriszele ... 2/4						
	Microvarbora ... 2/4						
	Subesoni ... 2/4						
CORYDORAS							
	Harlequin (Dwarf) ... 4/-						
	Macromaximus ... 10/-						
	Palatus ... 4/4						
	Anna ... 4/4						
	Anna (large) ... 4/4						
	Malawi (large) ... 4/4						
	Aratus ... 10/4						
	Great Khuli ... 3/4						
	Glass Cat ... 2/-						
	Japanese Weather Fish ... 7/4						
	Khuli Leach ... 2/4						
	Sucking Loach ... 4/4						
	Aymoran ... 4/4						
	Ossimilias Affinis ... 7/4						
	Myra (large) ... 10/4						
	Corydoras Juli ... 10/4						
	Beaufort Loach ... 4/4						
	Pygmy Species ... 12/4						
	Sea Cat ... 3/4						
	Nannostomus 2" ... 10/4						
	Nannostomus 4" to 5" ... 15/-						
	Horse Face Loach ... 5/-						
	Walcotts Cat ... 12/4						
	Sea Cat ... 12/4						
	Powdermill Cat ... 4/4						
	Whipcat Cat ... 12/4						
	Nying Fox ... 1/-						
	Fairy Mountain Fish ... 17/4						
CICHLIDS							
	Angels						
	Standard ... 2/-						
	Lace ... 2/4						
DWARF CICHLIDS							
	Kribia ... 10/-						
	Nannostomus Anomali ... 7/4						
APISTOGRAMMAS							
	Agassiz ... 4/4						
	Retzi ... 9/-						
	Ramirez ... 5/4						
DANIOS							
	Spotted ... 2/4						
	Giant ... 2/4						
	Pearl ... 2/-						
	Fractal ... 2/4						
	Galaxy ... 2/-						
	Danio Davaris ... 2/4						
SHARKS							
	Black ... 4/-						
	Diamond ... 12/4						
	Red Fin ... 2/-						
	Red Tail (black) ... 4/-						
	Red Tail (black) ... 4/4						
	Large Red Tail 4" ... 12/4						
VARIOUS OTHERS							
	Malawi Angels ... 10/4						
	Bumble Bees ... 2/-						
	Silver Fox ... 5/-						
	American Flats ... 3/-						
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	Australian Rainbows ... 2/-						
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	Madras ... 12/4						
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	African Gobies ... 4/4						
	Puffers ... 10/-						
	Butterfly (Adult) ... 12/4						
	Silly Eels ... 2/4						

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

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TROPICALS	POND PLANTS	AQUARIUM OR POND
No. 1 30 plants including Dwarf Lily <i>Cryptocoryna</i> <i>Hicoria</i> etc. £1	No. 7 30 plants including Marginals £1	No. 14 12 Sagittaria 6 <i>Thyrsophyllum</i> 6 Ludwigia 6 Hornwort 6 <i>Parsons Riccia</i> 3 <i>Parsons Hair Grass</i> £1
No. 2 12 <i>Vallisneria</i> 12 <i>Myriophyllum</i> 3 <i>Micra Sagittaria</i> 6 Ludwigia 6 <i>Elodea Densa</i> £1	No. 8 20 Pond Plants 1 Cream Water Lily (<i>Princeps Alba</i>) £1	No. 15 50 Plants for your Aquarium—Value 30/- £1
No. 3 12 <i>Vallisneria</i> 6 <i>Myriophyllum</i> 6 Ludwigia 6 <i>Elodea Densa</i> 6 <i>Bacopa</i> 1 Amazon Chain Sword 1 <i>Parsons Hair Grass</i> £1	No. 9 2 Bull Rush 3 Iris 3 Burr Rush 3 <i>Farges-Me-Nots</i> 3 Water Mint 10/-	No. 16 6 <i>Vallisneria</i> 6 Hornwort 6 <i>Elodea Densa</i> 2 Hornwort 2 <i>Parsons Hair Grass</i> 10/-
No. 4 1 <i>Nymphaea Stellata</i> 1 Giant <i>Hygrophila</i> 1 <i>Aponogonatum</i> 1 <i>Wisteria</i> 1 Giant <i>Sagittaria</i> 1 <i>Cryptocoryna</i> 1 Indian Fern 1 <i>Parsons Hair Grass</i> £1	No. 10 12 Marginals 6 Oxygenating Plants 10/-	TROPICAL OR COLD
No. 5 6 <i>Vallisneria</i> 6 <i>Myriophyllum</i> 6 <i>Hygrophila</i> 6 <i>Elodea Densa</i> 10/-	No. 11 Cream and Yellow Water Lily— <i>Princeps Alba</i> 2 for £1 12/6	No. 17 Giant Amazon Sword Plants 6-8 inches 7/6
No. 6 1 <i>Parsons Hair Grass</i> 1 <i>Parsons Clover</i> 6 <i>Micra Sagittaria</i> 6 <i>Bacopa</i> 10/-	No. 12 Water Lilies 1 Pink 1 Red 1 Cream 3-year-old plants £2	No. 18 Water Lettuce Very beautiful plants or 3 for 10/- 2/6
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
Algae eating Pond Snails: 6d each

14"-16" Hygol Carp: £15 per pair. Limited Number Available.

Large Stocks of Coldwater Fish—Thousands of Tropical Fish in Stock

Stocks of all Ponds, Fountains, Statues, etc.

FULL CATALOGUE ON APPLICATION S.A.E.


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Completion date and times will appear in the next issue of "The Aquarist".

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36in. x 12in. x 15in. bow-fronted aquarium with wrought iron backbone stand £29.25/- complete.

48in. x 12in. x 15in. — 29 gns.

Available in penny bronze, black & gold, and cream

WITH FLAIN STAND	
Each 48 x 12 x 15	£22.15.0
" 36 x 12 x 15	£15.15.0
" 24 x 12 x 15	£12.10.0

Complete with Stand and Hood (12in. to centre of bow)

All Standard Sizes of Aquariums in Stock. Any shape or size made to Customers' Specifications. Installations a Speciality.

REMEDIES, etc.	
Aquarium	3/6
Broaden White Spot	1/6
Cure	2/-
Vivo Salt	1/6
Sea Salt	1/6
Tetracene	all 4/6 each

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

Halomid	3/6
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Oxydine	2/6
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Please add 1/6 extra postage on appliances orders up to 10/-; 2/- up to 20/-; 2/6 up to 30/-.

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Constant External	23/-
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OUVALE	18/-
Int./AGL	15/-
Int./AGL "Popular"	10/-
"Poplar" with auto indicator	13/6
Rena (with Noed)	21/-
"Ea-Ea" Sensual	24/6

THERMOMETERS

Mercury	4/6
Cent	4/6
Plastic Backed	6/6
Spirit Blue Cent	5/-
"Ea-Ea" Dummy	4/6

FILTERS

"Woodmill" Plastic Outside Filter	19/6
"Woodmill" Biological Aquarium Filter 12in.	18/-
"Woodmill" Repeat Inside Filter	18/-
Center Filter	4/-
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"Silent Fun" Outside Filter	17/6
"Klear King" Outside Filter	22/6
Bottom Filter	8/3
Decorational Rock Filter	17/6
Udo Pad Filter	3/6

AERATORS & PISTON PUMPS

Monitors	each
21"	21/-
24"	24/-
27"	27/6
30"	30/-
33"	33/-
36"	36/-
39"	39/-
42"	42/-
45"	45/-
48"	48/-
51"	51/-
54"	54/-
57"	57/-
60"	60/-
63"	63/-
66"	66/-
69"	69/-
72"	72/-
75"	75/-
78"	78/-
81"	81/-
84"	84/-
87"	87/-
90"	90/-
93"	93/-
96"	96/-
99"	99/-
102"	102/-
105"	105/-
108"	108/-
111"	111/-
114"	114/-
117"	117/-
120"	120/-

HEATERS

"QUEENSBOROUGH" 2in., 4in., 6in., 7in., 10in., 12in., 15in.	each
Rena (75-200°)	10/-
"Ea-Ea" Flexible Heaters (100°)	19/-
"Ea-Ea" Thermostatic Heaters, 100° and 150°	36/-
Proset-matic	24/6
Imax-Pat. Thermostatic Heater 22in. and 26in. Heater Holders	2/-

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Contents

	Page
A Surprise Spawning	19
A Small Danio	20
Breeding Time is Here	21
Having Trouble with Green Water?	22
The Spraying Tetra	23
Carrying Boxes for Fish Jars	24
Ferns for the Pondside and Water Garden	26
Apistogramma raimondi	27
Metal Foil as an Aquarium Background	29
The Miller's Thumb	30
Aquarist's Notebook	31
Readers' Queries Answered	32
Our Readers Write	34
Leeches	36
The Aquarist Crossword	36
News from Aquarium Societies	37

A Surprise Spawning

by G. BIRKIN

MY successful spawning of the red-tailed black shark came as a complete surprise to me as the two specimens I obtained were intended for a community collection. The specimens were about 3 inches long. They were jet black with a crimson-red tail and the dorsal and ventral fins were edged with white. Their age was not certain but estimated at about 3 years.

The rocks and gravel in the spawning aquarium (size 24 in. by 12 in. by 12 in.) were arranged in tiers and in the tier at the bottom a cave was made by resting the front edge of a piece of slate across two stones and allowing the rear edge to rest on the base of the tank. The piece of slate was about 6 in. long and 3 in. wide. In the centre of the tank near the front a piece of rock about 6 in. long and 2 in. square was stood on its end to form a pinnacle.

Sagittaria natans was planted thickly in 1½ in. of gravel below the tier and there was also a clump of *Calanthe coccinea*. On the tier itself there was a large clump of *Hydrophila polyperna* and a few pieces of water wistaria and red *Hydrophila*. An abundant amount of *Najas kingii* was allowed to float near the surface of the water. After 2 weeks, when the water had aged a little, about half a teaspoonful of sea salt was added to the water. The pH at this time was roughly 6.9 and the temperature 76°F (24°C). The two fish were then placed in the aquarium, supposedly as a basis for a community collection.

For about 2 hours they both lay perfectly still on the gravel. After this time, however, the male became very active and started swimming quickly round and round the female. She paid no attention to him whatsoever and finally he had to nudge her. Immediately she started dashing about, with the male in hot pursuit. Before long they both stopped by the side of the rock pinnacle. They hovered side by side, slowly turning over and revolving round the pinnacle. This continued for 5 minutes, when the male again nudged the female and about 50 eggs were scattered rapidly from her vent. As they sank slowly to the bottom of the aquarium the male dashed wildly about amongst them and was obviously fertilising them. Once the eggs had reached the bottom the parents paid no attention to them and it was assumed safe to leave the parents in the aquarium.

The next morning it was a great shock to find all the eggs gone. Only one of the sharks was in sight and this was seen to be hovering just outside the mouth of the cave. Eight days later both of the parents were hovering outside

the cave and upon close examination a number of tiny fry were just visible inside the cave. It seems apparent therefore that after the spawning the parents by some means transported the eggs into the cave for safety and one parent remained there to care for the eggs whilst the other stood on guard outside the cave. However, the eggs had been presumed eaten and no special foods had been introduced to the tank for the fry to live on. Although Infusoria was immediately introduced to the tank it was too late to save the fry and after that day no more were seen.

The parents, after about a week, repeated the strange spawning process but this time no eggs were seen. Soon after this both parents died mysteriously, as there was no apparent sign of disease.

At the time of this spawning I had been keeping tropical fish for about 9 months and only had two tanks. Budding aquarists may realise therefore that it is not only the professional breeders who can breed difficult fish such as this although I am prepared to admit that had I been more experienced I would probably have saved the fry.

A Small Danio (*Danio devario*)



by LEBISTES

THIS fish, which belongs to the family Cyprinidae, is one of the smaller members of its genus, and grows to about 3½-4 in. in length. It is native to the fresh and slightly brackish waters of northern India, and will withstand a slow drop in the temperature to 65°F (18°C), even less, for short periods, with no ill-effects. All the same, a range of about 72°F (22°C) to 75°F (24°C) is more satisfactory for normal maintenance, with a rise to 78°F (26°C) to 80°F (27°C) for breeding.

The general colour is greenish silver, darker on the back, lighter on the sides and underparts. Some vertical yellow markings on a shimmering blue ground ornament the shoulders. Three blue stripes, with yellow in between, extend from about halfway along the body to the base of the tail. These they join, and continue as a single band on to the upper lobe of the watery green to yellow caudal fin. The dorsal fin is brownish adorned with white along the upper edge; the ventral and anal fins are reddish; the pectoral fins are clear. In mature fish the female is bulkier than the male, and less colourful in appearance.

The species is ideally suited to community life in any tropical tank large enough to house it because, apart from its peaceful disposition, it will eat anything alive or dried, and is always on the go—for the most part in the middle levels of the water.

To breed it a tank measuring about 24 in. by 12 in. by 12 in. or larger is required. This should be filled with water straight from the mains, fitted up with a thermostatically controlled heater (an even temperature for the fry is of the utmost importance), furnished with several tied bunches of bushy-foliated plants anchored with lead strips or stones to the bottom, which need not be carpeted with compost, then left to settle and mature for a few days before introducing the fish.

It is no use expecting a pair of *D. devario* to mate right away unless both of them are in ripe spawning condition. This is denoted by swollen sides in the female, and brighter colours in the male. Sometimes it is a good idea to place the female in the prepared tank several days in advance of the male. For then, when the pair are reunited, the chances are that egg-laying will follow almost immediately, that is, if the temperature is made right and the light is bright.

The eggs are scattered as the two sexes chase and pause, with quivering bodies, every so often, in or over the submerged vegetation. As soon as the spawning-act is over, and sometimes before it is over, the fish will seek out and eat the eggs. It is important therefore to keep a close watch on the spawners, and as soon as their interest in chasing starts to wane, remove them to another tank as quickly as possible.

The eggs, which are quite large, hatch in about 24 to 30 hours, and for roughly the same length of time the glassy-looking fry dangle tail-down from the plants and the sides of the aquarium. During this state of quiescence, they live on the nourishment contained in the yolk sac. As soon as the yolk sac has been absorbed, they assume a normal horizontal position, and swim off in a somewhat jerky manner in search of microscopical food.

For about 2 weeks frequent helpings of Infusoria or flour-fine dried food are called for, after which micro worms, freshly hatched gnat larvae, tiny *Daphnia* and so forth should be placed on the menu. If dried food makes up the major part of the dietary, take care that all leftovers are dip-tubed daily off the bottom to prevent pollution of the water.

Under good conditions the youngsters show plenty of colour in under 3 months, and attain full size in 9 months to a year.

ABOUT THE POND THIS MONTH

Breeding Time is Here

by A. BOARDER

THE times at which fish may breed in the outdoor pond vary with the position in the country and the type of weather to be expected. The southern parts will be the first to feel the effects of the warmer days and here it can be expected that the fish will spawn. Some goldfish will spawn in late April in suitable weather whilst others may not do so until as late as July. There is considerable doubt about what makes the fish start to drive and to spawn. Various suggestions have been put forward over the years and I myself have held different theories at different times.

The condition of the water appears to me to be one of the main factors and I do not think that goldfish are as likely to spawn in water that is at all foul as they would be if the water was clear and well oxygenated. Of all the factors which are likely to keep the fish from spawning I would put lack of oxygen in the water first.

The would-be breeder of goldfish must consider several points before actually allowing the fish to spawn. It must be realised that all fancy goldfish can breed with any other variety and so if a pure strain is required then it is useless to have any types of goldfish in the pond other than those needed for breeding. For instance, common goldfish can breed with fantails, veiltails, moors, orandas etc., and so the need for one type in the pond is essential. If one has no need to breed true to any type then it does not matter what fish are in the pond, but the resultant youngsters will be only cross-breeds, not worth the food they will eat.

In a mixed pond it is possible that even if the fish breed, most of the eggs, or the fry soon after hatching, will be eaten unless there is plenty of dense plant cover. The fact that both male and female fish must be present is naturally understood by any pondkeeper, but it is not everyone who is able to tell the sexes apart. When the fish are swimming in the pond it is probable that on any warm day they will lie rather quietly at the surface of the water, and at this time of the year the female fishes will be seen to be much fatter in the body than the males. Often, especially in the short-bodied fancy goldfish the body will appear to be swollen more on one side than the other. The swelling is caused by the presence of many eggs, the hard roe, and the soft roe, or milt, of the male does not take up so much room and so the fish looks slimmer. There is also a very good sign which is often shown by many males. On the gill plates and also sometimes on the front parts of the pectoral fins, may be seen small, raised, white dots. They stand out like little pimples and on some males are very prominent. It has been said that some females also show these raised dots, but I have not come across such a happening myself.

The next point to be considered is the age of the fish. Although I have bred with fantails only 11 months of age I do not recommend breeding with fish under 2 years old. As for the upper age, this depends entirely on the way the fish have been looked after. It is possible to breed from any variety of goldfish up to at least 12 years of age. I think that I have had older fishes than this breed but it is not easy in a pond to be sure how old the individual fish are as they may look very much alike.



Both of the ponds and the water cascade in this picture were installed at ready-made fibre-glass units (manufactured by Fibretile)

It has often been stated that it is better to have several males to each female rather than to use one pair. I do not see any advantage in this as one male has sufficient sperm to fertilise every egg laid by dozens of females. It may be that in the pond the attentions of more than one male will encourage the female to spawn more readily than if only one male was in the chase.

Before any fish can be expected to breed they must be in tip-top condition. This can be achieved by first of all making sure that the water is in first-class condition and then to feed the fish on something which invigorates them and assists in the formation of eggs. Not that the eggs form suddenly. They are in the fish already during the winter months but there is something which ensures that they are ready to be laid when the time arrives. One of the finest, if not the finest, foods for all types of goldfish at this time of the year are garden worms. These should be broken if they are large or if the fish are on the small side. These can be given every day as well as some of the usual fish foods as used in ponds. Be very careful, however, not to feed too lavishly with dried foods. Not that a little dried food is not needed but that if it is given too freely the unseason particles are certain to pollute the water. Nothing must be done at this time of the year to foul the water in any way.

It is probable that some goldfish will spawn in May, but others may not do so until June. I have even known them to make their first start in July. It can be very frustrating for the pondkeeper to watch each day for signs of a spawning and yet nothing happens despite the fish appearing full of eggs and in prime condition. On the other hand I have known people who have bought a few small common goldfish and they have bred soon after without any trouble on the part of the owner. As I have already stated it is probable that most goldfish will only spawn when there is a good proportion of oxygen in the water. If the fishes

show no signs of spawning by the end of June, some of the pond water should be removed and some fresh run in. When doing so make sure that the jet is well split up; a fountain type is good, but one can let the hose play on the side of the pond so that the water is broken up and can take in plenty of fresh air.

When the fish are about to spawn it is often to be noticed that they are following one another about, on the evening before the day of spawning. If this is seen it is a good plan to place some bunches of fine-leaved water plants at a shallow part of the pond. These bunches should be anchored to the side and should float on the top of the water. The fish like to spawn on plants almost out of the water. When some eggs are seen these bunches can be removed to a hatching tank and fresh bunches replaced.

There should be no doubt about when the fish are spawning, as the males chase the females about vigorously and nudges them through the water plants. This is when the eggs are laid and fertilised. Spawning can take place early morning and up to mid-day. It often ceases then, but at times I have known spawning occur well into the afternoon.

The eggs are very small when first laid but swell to about the size of a pin's head soon after. They are usually fertilised very soon after being laid as the male sperm do not live very long in the water unless they find an egg to enter. The eggs are laid singly and show up on the plants as little transparent blobs of jelly. If a bunch of weed with eggs is raised from the water the eggs show up more amber coloured. Hatching and rearing will be dealt with in a later article.

Having Trouble with Green Water?

by N. H. BENNETT

ALGAE, the scientists tell us, were some of the first plants to inhabit the earth. They are still the quickest growing plants and other scientists are planning for "space-men" to grow their own algae cultures in glass bottles on their long journeys in outer space, to obtain fresh vegetable matter. Algae were suggested because of their rapid rate of multiplication.

This may be interesting to pondkeepers, but of little consolation when they are troubled by either "green water" in their pond or "blanket weed".

Green Water

This is caused by millions of free-floating, microscopic algae floating in water. The spores of free-floating algae occur in the air all over the world and any jam-jar full of water left on a sunny window-sill will go green. Any pond will go green in sunlight if it has not a vigorously growing underwater plant population. These so-called oxygenators use up the available mineral plant food in the water and so starve the algae out of existence. Oxygenators could equally well be called "water clearers".

It is perfectly normal for a pond to become pea-soup green 2 weeks after planting. It will not clear until the submerged aquatic plants (oxygenators) start growing vigorously. This may be several weeks, months or even a year in obstinate cases. The best advice is to be patient. Water lily leaves, marginals and a heavy covering of floating plants all help to cut down the sunlight reaching the water and discourage the algae.

It is generally useless to change the water as you only give the algae a fresh supply of food in the new water and the growth may become even worse than before after a few days.

In obstinate cases, however, draining the pond and refilling may be tried as the extra light received by the oxygenators causes them to grow more vigorously and thus beat the algae over the battle for the plant food that is dissolved in the water.

In my long experience I have not found any chemical preparation that is satisfactory in obtaining clear water in an ornamental pond. Green water is not detrimental to fish; in fact they thrive in it. It is excellent for feeding newly hatched fish.

Blanket Weed

This is the name usually given to a number of different species of string-algae which have the appearance of green cotton wool. It grows on the pond walls and over the submerged plants. It is usually introduced by water beetles of various species, which take to the air at night, bringing with them a small fragment of blanket weed from another pond.

Blanket weed is unsightly but not really detrimental to fish life. They will spawn on it although occasionally a young fish will get caught up in it. Copper sulphate has been recommended to control blanket weed but after many years of experiments I have decided that any concentration of copper sulphate which will kill the blanket weed will also kill the fish and other plants in the pond.

I recommend the following course of action, which has usually been most successful. At any time during the spring or summer, preferably in a hot dry period, the pond should be emptied, leaving only an inch or two of water in the bottom. A submersible electric pump is very useful for this operation. Remove as much of the blanket weed as possible but (this is most important) leave the roots and 2 inches of the stems of the "water weeds" undisturbed.

Leave the pond with an inch or two of water in the bottom for at least a week, preferably in hot dry weather. The algae on the walls will dry and die.

On refilling with a hose after a week, the water will probably go green after a further 2 weeks but the oxygenators, if they were not uprooted, will break into vigorous growth and should appear free of blanket weed at the surface.

Beneficial Treatment

Fish and water lilies will survive in 2 inches of water for a week but if you are worried about the fish the larger ones can be removed to a temporary home for a week. The lilies can be covered by a wet sack. This "leaving nearly empty" is excellent treatment for any pond once a year in spring or early summer. It is generally more successful and far less trouble than a complete clear out as the vital roots of the oxygenators and stems are left undisturbed and ready to go into immediate action when the pond is refilled.

The Spraying Tetra (*Copeina arnoldi*)

by JACK HEMS



THIS species, from Brazil, the Guianas and Venezuela, is commonly called the spraying tetra, the spraying characin, the spraying characin or Arnold's characin. It is remarkable in that, when mating time arrives, both sexes leap together out of the water to spawn on the underside of some overhanging leaf or, in the aquarium, on the underside of the cover glass. This fantastic performance is repeated over and over again until the female is spawned out. Then the male takes up a position in the water some little distance from the eggs and, every now and again, dashes forward to lash the surface with his well-developed caudal fin and tail. The spray that these lashings sets up keeps the eggs thoroughly wet. The eggs hatch in 2 or 3 days, and then the dark fry drop down into the water. These may swim about in all directions in search of microscopic live food. As a rule the parent fish make no attempt to eat them.

In breeding this fish the following aids to success should be used. Firstly, the spawning ground must be within 2 or 3 inches of the water. Secondly, it is recommended that the spawning ground should have a slightly granulated or non-slip surface; for any eggs which fail to adhere to the glass and fall into the water will not hatch. Indeed, it is a practice among experienced breeders of *C. arnoldi* to suspend a piece of green-painted frosted glass, or a similar substrate (not necessarily green) horizontally, or at a slightly tilted angle, under the cover glass. The water should be matured, soft, and neutral inclining to acid in character. The temperature should average around 82 F (28°C). The light should be diffused rather than bright. Further, just before and just after egg-laying takes place (pre-spawning signs are a sudden intensification of colour and plenty of frolicking at or near the surface) it is advised to feed the fish very generously on live food such as *Daphnia*, mosquito larvae or white worms dispensed from a perforated feeder. For there is nothing so certain as a full stomach to keep any cannibalistic leanings in check.

C. arnoldi is not a large fish. It seldom exceeds 2½ in. in length. It is also pencil slim. Yet it has plenty of energy and a captivating array of colours. The back is brownish yellow, the sides are yellowish to green overlaid with a reddish sheen, and the underparts are yellowish white. The largish scales have black edges which create an interesting net-like effect. A dark stripe extends from the mouth through the golden-rimmed eye to the gill-covers, which are also ornamented with a greenish-gold blotch.

In both sexes the fins have some red in them, but in the

male the red is very pronounced at or near the tips, which are sometimes marked with black, and the fins are much longer and more pointed than those of the female. Another thing, in the male the upper lobe of the caudal fin is greatly elongated, and there is a black spot above a white ground near the base of the dorsal fin.

C. arnoldi minds its own business and causes no trouble in a community aquarium. It usually swims in the upper levels of the water and though it eats live food with great relish, it will not refuse dried food. It seems happiest and healthiest when it can live its life among tall-growing or floating vegetation. For normal maintenance, a temperature of 72 F (22°C) to 75 F (24°C) is as good as any. There are two other members of the genus known to the tropical fishkeeper. One of them, *C. callioptera*, has its scales adorned with shining red dots, and deposits its eggs on leaves under the water; the other, *C. gottardi*, is another red-spotted species, but its sides are blue, its back is brown, its belly silvery white. It is not as streamlined as the former species and it chooses depressions in the sand in which to lay its eggs.



"It's our aquarists' club tie"

Carrying Boxes for Fish Jars

by ROBERT M. COOPER

NEARLY all aquarists now use the standard 2 lb. show jar, both for show purposes and for transportation of fishes. It is therefore essential to have a well made, properly insulated, carrying box for these jars. Such a box is not difficult to make and is well within the capabilities of the average aquarist.

The standard 2 lb. show jar measures 4½ in. by 4½ in. by 6½ in. Allowance is made for insulation, ½ in. at each side and ½ in. at top and bottom, and therefore each section of a box will have internal dimensions of 5½ in. by 5½ in. by 7½ in. The dimensioned plans of four boxes are given and the construction is similar in each.

If a choice of wood is possible, redwood is ideal because of its qualities of lightness, durability and easiness of working. Care should be taken to ensure that no serious defects are present. Examine the wood for shakes (splits) and dead knots (knots which have black edges), as these will fall out, leaving a hole. Remember that you have paid dearly for the wood, see that you get good value.

It is not generally known that in box construction the box is made as one unit and the lid sawn from the box in the final stages of production. It will be appreciated that this is the only way of ensuring that the lid will fit the box exactly.

In jointing the corners, a through dovetail would undoubtedly give the strongest job, but the rabbet joint shown is easier to make and quite strong enough for the purpose.

Procedure for Making the Box

1. Cut the material to the required lengths.
2. Mark out and cut the joints. In this respect it is a good idea to make a practice joint first.
3. Glue and nail the joints. There are many waterproof glues on the market now which are excellent for the job. In nailing I recommend 1½ in. no. 16 panel pins using five in each joint. Care must be taken to ensure

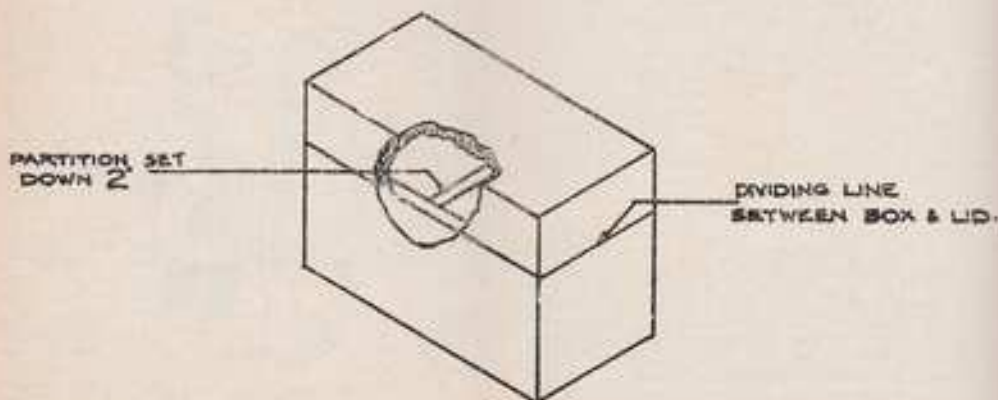
Materials required			
	Redwood or similar softwood	Plywood	
1-jar box	27.2 in. by 7½ in. by ½ in.	Two 6½ in. by 6½ in.	
2-jar box	35.8 in. by 7½ in. by ½ in.	Two 17.0 in. by 6½ in.	
3-jar box	52.0 in. by 7½ in. by ½ in.	Two 15.0 in. by 6½ in.	
4-jar box	60.0 in. by 7½ in. by ½ in.	Two 15.0 in. by 11.0 in.	

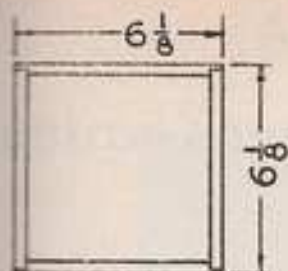
The wood should be cut to the following lengths, the ends of which must be square:

1-jar box	Two 6½ in.	Two 5½ in.	
2-jar box	Two 11½ in.	Two 5½ in.	One 5½ in.
3-jar box	Two 17½ in.	Two 5½ in.	Two 5½ in.
4-jar box	Two 11½ in.	Two 11½ in.	Two 10½ in.

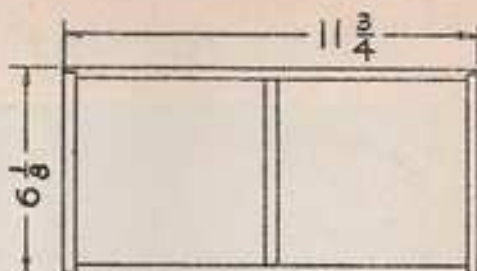
that the pins do not coincide with the line of the lid joint.

4. The plywood should be glued and pinned on immediately, and provided it was square and kept flush with two adjacent sides of the box, the box is sure to be square.
5. Punch all nails below the surface and fill the holes with filler.
6. Plane off all surplus plywood and smooth the sides of the box with a sharp smoothing plane, planing from both ends to avoid splitting the end grain. Remove all the sharp corners.
7. Glasspaper all surfaces.
8. The lid should next be cut. Mark a line all round the box 2 in. from the top. This is the line dividing the box and the lid. The box must be held firmly and, with a panel saw (or a saw which has fine teeth and no back), begin sawing at one corner. Saw very carefully, watching the two adjacent lines, until the saw can work inside the box. Saw down each side in turn, taking care not to split the last side. It will be appreciated that this is by far the most difficult operation, and it would completely ruin the box if badly done. A little

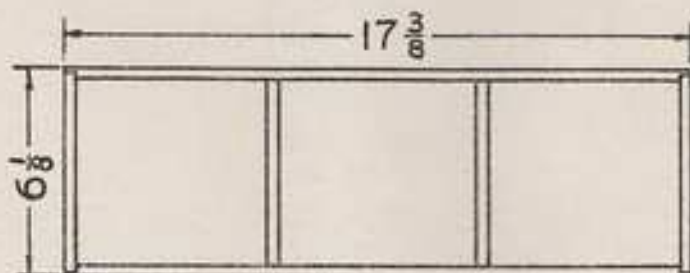




BOX FOR 1 JAR



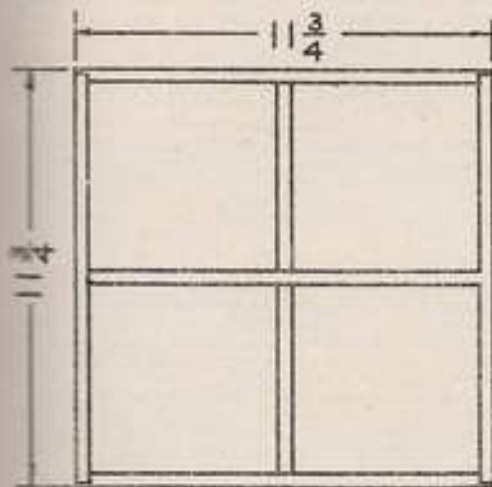
BOX FOR 2 JARS



BOX FOR 3 JARS

help from an experienced woodworker is perhaps the best advice here.

8. With the aid of a sharp plane the joint should be made



BOX FOR 4 JARS

smooth and close fitting. Fit the back edge first, then the adjacent edges, and finally the front. A good fitting joint is essential as most heat is lost at the joint.

10. Fit the hinges. These may either be 2 in. brass edge butts or one length of piano hinge. A book on woodwork will show how these should be fitted.
11. Fit the dividing partitions, taking care not to bulge the sides.
12. A variety of fasteners is available but the locking type of clip seems to be most popular.
13. The handle might be one consisting of a leather or webbing strap fixed on the box ends, or one of the attaché case type, which I have used with success on the 2-, 3- and 4-jar boxes. To ensure that the handle will be secure, it should be bolted to the lid, with large washers inside to spread the load.
14. The box may either be painted or stained and varnished. Personally I have used Colron Wood Dye (walnut) on redwood followed by several coats of shellac varnish, rubbing down between coats with steel wool.
15. A small piece of tape or chain fitted between the box and the lid would prevent strain on the hinges when the box is open.
16. The insulation should now be fitted. Perhaps it would be more appropriate to refer to this as packing since wood is a good insulator in itself and the main purpose of the "insulation" is to keep the jars firm and to act as a shock absorber. I have used foam rubber, carpet felt and cuttings from fitted carpets; the least successful being foam rubber as the resulting friction was too strong. The "insulation" should be left loose to facilitate removal if it becomes wet.

Ferns for the Pondsides and Water Garden



A damp corner of the garden in which ferns provide the main foliage is the setting for this small lily pond

by
JAS. STOTT

FERNS, carefully selected and sited, are capable of greatly enhancing the planting of a pondsides, especially a pond of informal design, and for the larger area of a water garden they become almost a necessity in the overall planning scheme if the general effect is to be convincing.

Hardy ferns, in the main, needs a moist, shady spot with deep leaf mould into which the roots can penetrate to flourish, but they are an accommodating group of plants. Among them are species which will grow in the drier conditions among the higher levels of the rock edging, such as some of the spleenworts and the wall rue. Others are happiest when in close contact with water and therefore ideal for planting near waterfalls, where they can benefit from the spray and moist atmosphere. Two species which come to mind as suitable for such a position are the lady fern (*Adiantum filix-foemina*) and the broad buckler fern (*Dryopteris dilatata*). Plant them with their roots under rocks at the side of the fall, where they can penetrate into rich leaf mould and the fronds can pick up the spray from the fall.

At the Edges

For planting along the edge of the bog, where the fronds of the ferns can wander over the surface of the water at the pondsides, the sensitive fern (*Osmunda sensibilib*) is a good choice and if planted in company with the marsh buckler fern (*Dryopteris thalictroides*) the effect is quite attractive.

One of the most beautiful ferns is the royal fern (*Osmunda regalis*), but in view of the fact it is capable of growing to a height of some 6 to 7 feet it is not a choice for the smaller type of pond, but where space and pond size permits it can make a delightful focal point among the plants at the water side. For the owner of the small pond, however, there is a dwarf form and that is *O. cymosa* and although not so impressive is well worth consideration.

Where bog meets the base of an area of raised rockwork there is the ideal situation for one or two roots of the evergreen hart's-tongue fern (*Scolopendrium vulgare*), and this one is also suitable for planting among the rocks beneath a waterfall.

The soft prickly shield-fern (*Polystichum asplenifolium*) is another choice subject and can form an attractive background for a cluster of bog irises, such as *Pseudacris* varieties or the white variety of *I. lacustris*.

For deeply shaded positions, where the soil is moist but much drier than actual bog, there are several attractive ferns to choose from. My first choice is for the graceful ostrich feather fern (*Struthiopteris germanica*) if the position will allow for a maximum height of 4 feet and a fairly large spread. It requires a deep root run in rich leaf mould and peat. In a more confined position there is a charming evergreen polypody fern (*Polypodium vulgare*), growing to a height of some 18 inches.

A fern which always looks attractive where a rock banking forms a background to an informal pool is the hardy maidenhair fern (*Adiantum capillus-veneris*), which can be trained to spread down a slope between rocks to the pond edge on its creeping root-stock, a position that is natural to its requirements.

On Higher Levels

For planting in rock crevices and nooks at higher levels above the pond there are quite a number of species, native and foreign, from which to choose. The Alpine lady fern (*Adiantum alpestre*) is a delightful plant suitable for a rock pocket, where its full development will be permitted, for the fronds can achieve a length of some 2 to 3 feet when conditions are right. Ideal for planting in a narrow, horizontal crevice from which the deep green, slender fronds can grow to drape themselves over the rock surface below is the maidenhair fern (*Adiantum trichomanes*). It is a lovely little fern and when firmly established the fronds will grow to a length of some 10 to 12 inches. Some old mortar rubble mixed with leaf mould and coarse sand makes a good compost for this fern.

Another attractive species for a sheltered rock pocket is the holly fern (*Polystichum holschlerii*), also known as the rough Alpine fern. The fronds form into a dense tuft and grow from 12 to 18 inches long. In colour it is a dark, glossy green and the leafy part is thick in texture.

These species selected for mentioning are hardy, mostly native and will do well under cultivation in many parts of the country.

Apistogramma ramirezi



A beautiful pair of *Apistogramma ramirezi*

by A. VAN DEN NIEUWENHUIZEN

(Photographs by the author)

DO you know this fish, with its shiny blue body, its red-scanned fins with their blue spots and its fierce-looking head with the red stripe across the eyes? If you know it, perhaps you haven't kept it yet. In that case, try to buy some and you will experience much happiness with this wonderful dwarf cichlid. But, when possible, buy imported fish or ones raised by a good breeder, or fish raised from imported parents, because the latter have not yet degenerated as a result of bad breeding practices. I will come back to this point at the end of this article.

Apistogramma ramirezi is not a newly imported fish. In 1955 it made its victorious entrance on the aquatic scene, and, rightly, because it is one of the most beautiful dwarf cichlids. In the beginning many hobbyists kept *ramirezi*, but nowadays one does not see many really well developed specimens. This is a pity, and I will give some of my experiences with *ramirezi* here, in the hope of inducing you to start keeping the fish again.

A long time ago I kept, because of lack of space, 14 *ramirezi* and 17 *Rasbora* together in a 50 gallons tank. The hardness of the water was 12°DH, pH measured 8.3 and the temperature was kept about 77°F (25°C). The tank was lighted with a fluorescent 25 watt tube and was mainly planted with large *Cryptocoryne griffithii*. Originally I possessed only four *ramirezi* because, at the time I

bought them, they were very expensive and I considered two pairs more than enough at the price.

A few months later I discovered on a newly grown leaf a batch of eggs, which were closely guarded by a half-grown female. This was a reason for me to set up a special tank for my 14 blue jewels. I used a 50 gallons tank, which was placed under a window on the south, so that it received only daylight from above, with a lot of sun. However, the back part of the tank was always in the shadow. I built several terraces and put several rocks for the fish to deposit their eggs on. I filled the tank one-third with water of 12°DH and one-third with completely softened water (0°DH, pH 6.6). The temperature at the bottom of the tank was 75°F (24°C) and at the surface 79°F (26°C). The next day the 14 *ramirezi* entered their new domain and immediately adjusted well to their new surroundings. After 2 days the temperature was about 80°F (27°C) throughout the whole tank.

On 24th October the first pairs had been formed from the original eight males and six females. Several of the females now had the well-known dark red spot at the abdomen and the egg tube had become visible. To activate the fish I raised the temperature on the evening of 25th October and also filled the tank completely, now adding more soft water. The next day the temperature under the water surface was 82°F (28°C) and at the bottom



Female (left) and male *A. ramirezi* about to spawn on a rock

it was 80°F (27°C). Then I discovered a batch of eggs on one of the rocks, which must have been deposited in the early morning. This rock was located behind a thick bush of *Cryptocoryne*. The eggs were being guarded by a half-grown female and an adult male. At about noon the temperature under the water surface was 86°F (30°C) and at the bottom it was 84°F (29°C). This was not without effect upon the fish, because two more couples started making preparations for spawning. They worked diligently, cleaning their respective rocks, at the same time taking turns in guarding their selected territories. Each active couple occupied a strictly outlined area and did not allow any intruders into this. As a result, the rest of the *ramirezi* were congregated in the centre area of the tank.

At 3 o'clock in the afternoon one of the pairs started to spawn on rock number two, ending their job at 5 p.m. This rock was lying behind a group of *Avroni* and under a few large leaves of an *Echinodorus*. Between 3.45 p.m. and 6.10 p.m. another couple spawned on rock number three. It was a fantastic sight. The males hovered at the limits of their territories, threatening each other and now and then performing a sort of enemy territory. It was interesting to see how the males and the females changed guard now and then. At this time the male slowly backed up to about half the distance to his rock, while the female at the same time approached and took her spouse's place at the border of their territory. The male then took time off to fertilise the eggs, which had been deposited by the female gently striking her egg tube across the rock. First a rough circle of eggs was formed, then the open spots were filled up. The tube of the male is white, like that of the female but smaller in size.

In the above described way I gained three different batches of eggs within one day. I treated them in the following ways. Rock number one I put close to the surface and left it there, doing no more with it. The water in the tank was kept slightly moving by an air stream from an air stone in one of the corners. The following evening—also after 36 hours—I removed 178 mouldy eggs from this rock with a pair of tweezers. It looked as though the other eggs would soon come free, so I put the rock in a separate breeding tank. In this tank 48 young fish finally hatched. The young fish were fed with pond Infusoria, brine shrimps and micro worms. Fourteen days after hatching, they began to take small *Daphnia* and chopped *Tubifex* (only enough to be eaten immediately). After 5 weeks they measured 1/2 inch and were well built little fish.

The eggs laid on rocks two and three I treated differently. I put both rocks in separate enamelled containers and hung

these in two small breeding tanks (16 in. by 10 in. by 10 in. each). Through the use of two filters, the rocks were lying in water which was in constant movement. One of the rocks was located right under the water stream from the filter, the other right next to it. The temperature was kept at 86°F (30°C). After 24 hours 58 eggs on rock two were mouldy, as were 22 of those on rock three. After another 24 hours all of the embryos had come free and the bottom of the container swarmed with them. Each consisted of a tiny tail and an enormous egg sac and they all stuck together in a large heap.

Development of the Fry

The head became visible as a small swelling in front of the egg sac. At this stage, the rocks were removed from the containers and the inlets of the filters covered with a fine cloth to prevent the fry being sucked in.

I couldn't guess how many young fish there were. It was interesting though, to see how they developed further. After 4 days the embryo took the form of a tiny fish; the tail became wider, the head bigger with large eyes and the egg sac lost its large size. Colour of the young fish can be quite different; one batch can consist of dark brown specimens and another of orange or yellow-white ones. Of the latter kind I made a picture after 4 days; this is the reason that they appear so light in the black and white picture. On the head, as with many cichlids, is a little sucking cup, with which they stick to the solid parts of their surroundings. Five days after the spawning the fry were free-swimming. There were about 400 of them.

Let us go back to 27th October for a moment. That day I changed about 13 gallons of the water from the big tank for new, soft water, and lowered the temperature gradually to 76°F (25°C) at the surface and 75°F (24°C) at the bottom of the tank. On 1st November the temperature was raised again to 82°F (28°C), which resulted immediately in new egg deposits on rocks three and four. On 3rd November another pair became active, and this resulted in eggs on rock number five. The eggs on rocks three and four were from half-grown females and I estimated each at about 200 eggs. The third batch was from a grown female and numbered between 375 and 400 eggs. From these rocks 32, 33 and 19 eggs, respectively, became mouldy.

I now checked what kind of influence temperature had on the development time of the eggs. The ones on rock three were put in water at 86°F (30°C); after 14 days the



Embryo of *A. ramirezi* at 44 hours, just before hatching (temperature 86°F, 30°C)

tails were visible and after 6 days all the young were free-swimming. The eggs on rock two were given a temperature of 84 F (29 C). After 52 hours (about 16 hours later than in the previous case) the embryos showed a tail and the young swam free after 71 days. The eggs on rock five developed at a temperature of 79 F (26 C) and it took these embryos 72 hours to develop; after 10 days the fry were free-swimming.

On 15th November I again had a set of eggs and these I let develop at 75 F (24 C). It took 11 days before the young were swimming. All this clearly proves that the temperature has a large influence on the development of the eggs, a fact which might be of use to us. It could be, for instance, that your *ramirezi* are spawning, but that circumstances force you to be out of town for a while. It is then possible to regulate the time period the young will need to hatch by manipulating the temperature. If the young hatch and are not fed in time, they will die within 24 hours at 86 F (30 C) and 48 hours at 79 F (26 C). This shows that in general it is better not to keep the temperature too high. This is better for the fish and also gives us a bit more time to get the necessary food supply ready. If no pond Infusoria are available one can start right away with the feeding of new hatched brine shrimp. In this case, one should take care that the shrimp are spread equally over the bottom of the tank, because the young *ramirezi* tend to huddle together in definite small areas. If one corner of the tank is lighter than the rest, the brine shrimps will concentrate there, whereas the young fish tend to stay in the darker spots. The young fish will simply not find their food in this kind of situation and in such cases will starve. This has happened in my tanks.

General Conclusions

Here are some general conclusions from my experiences.

(1) *Apistogramma ramirezi* is very easy to breed. One pair can spawn several times in a row, with periods of 6 days' rest in between.

(2) This frequent spawning is a great danger for this fish species, and one should not breed the fish in this way. Three spawnings a month is more than enough; when there are more, the quality of the fry decreases sharply. If one permits the animals to spawn every week, one will notice that the number of eggs becomes smaller and smaller, while the fry tend to degenerate (both in form and colour). They stay much paler than normal and are not as strongly built as they should be. It is nice to breed the fish once in the above described technical (artificial) way, but you will have much more fun if you . . .



Embryos of *A. ramirezi* at 48 hours; colour is orange



These embryos of *A. ramirezi* are yellow-coloured (54 hours; temperature 86 F, 30 C)

(3) . . . use only one or two pairs in a smaller tank, in which the parents are left with their young. In this case it will be possible to enjoy the spectacle of the parents taking care of their offspring. I will not go into detail about this, because other writers have already done so. Remember to use only pairs which have selected each other from among several fish. Also remember not to remain constantly in front of the breeding tank. The fish like peace when they spawn.

(4) *Apistogramma ramirezi* gets its colour late, mostly after 4 months. It is therefore especially the form of the body which we have to judge when buying young fish.

(5) With this easily bred fish every hobbyist has a special responsibility. This is to select carefully the fish one is going to use for breeding. Badly developed specimens should be destroyed. Already a lot of harm has been done to this particular fish species. Just compare domestic raised specimens with newly imported ones. The former often hardly deserve the name *ramirezi* any more. This situation should not be perpetuated and it is the responsibility of every breeder to restore these beautiful blue jewels again to their old glory.

Metal Foil as an Aquarium Background

SEVERAL kinds of metal foil are available for wrapping chickens before cooking them in a hot oven. This foil can be used to make an attractive background to an aquarium, and it is possible that there might be some in your own kitchen at home. It has a shiny side and a dull side and the former seems to give a more attractive result.

Foil should be cut to a size about 2 inches each way larger than the back glass of the aquarium. A piece of stiff card cut to the size of the back glass has the foil folded over it with the duller surface inside. It is unnecessary to use glue as the foil when folded will remain in place. It can then be placed on the back glass and held in place with several strips of adhesive tape.

The foil can be used thus straight from the roll but a more attractive backing to the aquarium can be obtained if

the substance is first slightly crushed and then slightly straightened before attaching it to the card support. This method gives the background a certain quality of roughness which is effective. In both cases the foil acts as a reflecting surface for the contents of the aquarium which are slightly mirrored in it. Light reflected back into the aquarium seems to show the fish to better advantage and plants in the tank seem to grow even better for this. When an ordinary mirror is placed on the back of an aquarium it usually reflects the aquarist's face when he views his stock. This disadvantage is not present when foil is used as a background.

Kitchen foil could also be used inside the reflector hood on the aquarium to illuminate the interior of the tank evenly. A cover glass will prevent water from condensing on the foil.

If you have never tried foil as a background to your aquarium, you should. It may sound rather garish and unnatural but try it and you will probably agree that the end result is rather attractive and not in the least garish.

B. Whiteside

The Miller's Thumb by B. FRY



Photo:

W. J. Howe

COTTUS gobio, commonly called the bullhead or miller's thumb, is widespread over England and Wales, rare in Scotland, and absent, or said to be, from Ireland. Although not apparently found in the wild in Greece or Spain, it certainly appears to be native to the rest of Europe, Siberia and parts of Asia. A bizarre looking little fish, shaped somewhat like an inverted mandoline, it rarely exceeds 4-5 inches in length and belongs to the family Cottidae, which is mainly marine.

It has gold-rimmed eyes set on top of its broad head and a very wide mouth well supplied with minute teeth. The well-developed pectoral fins are held at roughly right-angles to the abruptly tapering body; the ventral fins, set under the pectorals, are adapted for supporting the fish on the bottom. There are two dorsal fins united at their bases by a tiny membrane; the front one is short; the back one, like the anal fin, is long and terminates near the slightly convex caudal fin. There are no scales except for a row of very inconspicuous ones along the lateral line. Each gill-cover is armed with a sharp spine. Internally its most distinctive feature is the absence of a swim bladder.

As with the chameleon, *C. gobio* can change its colours to match its mood, surroundings, or the quality of the light. In general, however, it is of a clayey hue mottled with darker blotches and spots. The underparts are whitish, sometimes with a violet sheen on the throat. The male is more elaborately patterned than the female and exhibits a genital papilla.

The fish is normally found in shallow streams—often at a high altitude—flowing over a pebbly bed. It is not an active species but lives mostly in a solitary state under stones or waterlogged pieces of wood. If suddenly dis-

turbed, and it senses danger, it will either puff out its gill-covers in an endeavour to frighten off the intruder, or shoot off with a rapid flurry of its tail to another lurking place. For food it snatches at a variety of things from aquatic larvae to other fishes almost as large as itself. But to the great annoyance of some anglers it is not averse from soaking out and eating other fishes' eggs.

In captivity it will soon become tame enough to take strips of lean meat or earthworms from its owner's fingers. It is fairly easy to keep in a coldwater aquarium provided that a suitably proportioned stone for it to retire under is included in the furnishings, and the water is well aerated and not more than about 6 inches deep. Another point, if several bullheads are kept together see that they are of about the same size or fighting, especially among male fish, will frequently break out.

C. gobio has been spawned in captivity, but no details are available. From all accounts in Nature breeding takes place from February to March. It is said that the male scrabbles out a shallow depression under or between stones into which the female is persuaded to enter. There the large, rose-tinted eggs that she lays in clusters after a short courtship are guarded against molestation from other creatures by the ever-watchful male. Even when the fry hatch out in 4 or 5 weeks' time, the male continues to watch over them until they are large enough to lead a separate existence.

Many old-time writers, emulous of Izaak Walton, have praised the bullhead for its culinary virtues. For these the writer cannot vouch, though the fish is reputed to be both tender and good eating when suitably seasoned and lightly simmered or poached.

AQUARIST'S Notebook

by P. M. FULLER

I THINK there is a case to be made for closer co-operation between schools and aquarium societies. The educational value of the aquarium has long been recognised, but many schools establish aquaria with little foreknowledge, and no guidance, unless they happen to be lucky enough to have an ardent aquarist on the staff. Recently the head of the biology department at a well-known school came up to me after having installed a tank containing angels and zebra fish. He wanted to know how long it would be before the angels bred. It was a shame to disillusion him, and to explain that the breeding of angels (unless one just happened to be very lucky) was a tricky business, usually requiring expert attention.

I think there are too many disillusioned and disappointed biology masters all over the country. Members of aquarium societies could make themselves known to the educational authorities and offer to give advice on the selection of fish and equipment, and help in the diagnosis of the various mishaps and minor setbacks that often accompany the initial stages of aquarium keeping. The presence in some shows of School Furnished Aquaria Classes is indicative that some work along these lines is being done, but I'm not at all sure that it's enough.

A gruesome, but in some ways amusing, story was reported recently about American alligators. Apparently the craze for keeping these creatures has reached such proportions in the 'States' that what to do with them when they outgrow their welcome is quite a problem. Rumour

had it that a few of these creatures had escaped to the sewers, which report was substantiated by the occasional disappearance of sewer-men when working in the drains, for no apparent reason. However, it was pointed out that the alligator requires a heated vivarium if it is to survive in captivity, and so it is extremely unlikely that it would be able to adjust itself to the cold of the subterranean underworld. But something must happen to those alligators increasing at the rate of a foot a year; they certainly don't all end up in the zoos—there just wouldn't be room for them. And, incidentally, something must have happened to those sewer men, too!

Now is the time to hunt for freshwater life in our streams, ponds and rivers, and there is far more to field ecology than jam jars and minnows. In a survey last year, I discovered seven distinct species of fishes, under 4 inches in length, all of which lived for varying lengths of time in an aquarium. However, surpassing the fish in length of life, and probably in interest as well, was the freshwater crayfish, which makes an interesting addition to any collection of freshwater life. They are primarily scavengers, feeding on dead fish, worms and even raw meat. Rapidly adaptable to life in captivity, they require shallow and alkaline water, preferably running, though this is not necessary as long as it is well aerated. Incidentally, gourmet aquarists might be interested to note that this is *Ereosia a patris blanchei*, as opposed to the larger continental species (*Astacus flavianalis*) known as *Ereosia a patris rougei* and which does not occur in this country.

Spring brought the arrival in this country of about 3 million low-grade goldfish from Italian fish farms destined to a short life in fish-globes and fair grounds all over England. The most regrettable feature of this trade is that the average life of these fish, estimated at about 9 months, is ideally suited to ensure the exporters an annual demand. But to experienced aquarists and dealers it can only appear as an incredible wastage of fish. Incidentally, if a means could be devised of preventing the vast influx, one could expect the general standard of goldfish in the country to be improved, because of the superior standard of home-bred fish; although it must be admitted that few of the poor quality foreign fish ever reach breeding condition. They merely enact a prolonged death from the moment of their arrival.

I'm often asked to advise on books on aquarium keeping, and I always find this incredibly difficult. There is so much available literature of a high standard, and when it comes to selection for a small library on aquarium topics the task often seems almost impossible. There are books claiming to contain all the vital knowledge on tropical fish-keeping ranging from 9d. to £7 10s., and I think the choice really boils down to how much you are prepared to spend. Vinden's *The Home Aquarist* (Pan Books, 2s. 6d.) is a good introductory volume to aquarium keeping, as is the Teach Your Self handbook *Indoor Aquaria*. Among the higher priced books *The Encyclopedia of Tropical Fishes* (F.F.H., 63s.) is probably the best on breeding



Photo: W. J. Hines

Underside of the freshwater crayfish revealed in a hold that prevents the inspector being pinched.

techniques, whilst Hans Frey's *Illustrated Dictionary of Tropical Fishes* (T.P.H., £3 approx.) contains more information on more varied topics than any other tropical fish book I have come across. As a comprehensive catalogue of freshwater fishes, their habits and requirements, Gunther Steyer's *Freshwater Fishes of the World* (Vista, 70s.) stands alone—and no library on aquarium topics could be complete without Van Duin's indispensable *Diseases of Fishes*.

In a recent Notebook I wrote of sundews in the aquarium, and I thought that was unusual, but I have recently come across orchids growing in one of the most splendid private vivariums I have ever seen. It was an impressive sight, which admirably suited the decor of the flat in which it was situated: flowering orchids rising up above lizard-covered rocks, over a pool that contained a pair of small

turtles. However, it should be said that the herpetologist was also an orchid grower, and the ordinary enthusiast would be foolish to try to adorn his tank with such magnificent (in cost as well as beauty) blooms. Perhaps he would have more success with another plant I saw growing there among the orchids—the African violet. In a warm damp vivarium, in pots, on a gravel base, he might be successful—but even African violets can be difficult.

If it's any consolation to aquarists who have suffered winter heating problems, Singapore breeders of Siamese fighting fish experience far more difficulty keeping their jars cool than we do in keeping our tanks warm enough. According to an American journal the practice of fighting these fishes is widespread, and it is common to see a row of *Betta* jars in the bathroom of private houses—this being the coolest place.

OUR EXPERTS' ANSWERS TO TROPICAL FISH-KEEPING QUERIES

What, in your opinion, are the most satisfactory plants to grow in a 36 in. by 12 in. by 12 in. tank that receives little daylight, but is illuminated by three 40 watt lamps kept burning for roughly 8 hours every day?

Among the plants that should succeed in your tank, especially if it is filled with soft, acid water, are *Cryptocoryna* spp., with special emphasis on *C. willmii*, *C. hazui* and *C. griffithii*, also *Najas lingu*, *Sagittaria subulata* and *Vallisneria spiralis*.

A week or so ago I set up my first tropical tank and stocked it with guppies and several rooted stems of *Colombia* and *Myriophyllum*. The fish have torn all the foliage from the plant stems (I have watched them picking at the vegetation), and I seem to spend most of my evenings removing the shredded plant life from the bottom. What can I do to keep my aquarium as attractive looking as the show tanks I have seen in so many dealers' shops?

Firstly, guppies do not pull plants to pieces. When they nibble at the foliage it is only to remove microscopic forms of animal and vegetable life that cluster on them. In all probability the plants in your tank have shed their foliage because they have been subjected to any one, or all, of the following inhibitors of healthy growth: a rapid change in the temperature of the water as, for instance, leaving them for a while after purchase in a dish of cold water; allowing them to become partially dried out during the journey home from a dealer; insufficient bright light. Further, the plants mentioned are not among the easiest for the novice aquarist to keep. Your best course at the present time is to dip-net the bottom to remove all the waste matter, and then restock with some inexpensive, rampant grower such as *Elodea densa*. If things improve within 2 weeks or so, continue to plant along the back and ends with *Vallisneria*, say, or *Sagittaria*.

I have just purchased a fish called the purple-striped gudgeon, which I understand is native to Australia. Please give me this species' scientific name as well as its general behaviour and requirements in captivity.

The purple-striped gudgeon is formally called *Megarrhinus megarrhinus*. As it can reach a length of about 6 in. it is recommended to accommodate it in a spacious aquarium. This should be furnished with rocks and some dense thickets of plants. A temperature range of about 64°F (18°C) to 78°F (26°C) suits it very well. It is an erratic-tempered species and, even in its smaller sizes, is best kept out of a community tank. It will eat almost anything, but should have plenty of flesh (live food or meat) included in its diet. It breeds readily in captivity, and the eggs are laid on cleaned stones or the sides of the aquarium.

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.

I have just taken possession of a steel aquarium frame measuring 36 in. by 12 in. by 12 in. I intended glazing it with five panels of 1 in. thick polished plate, but an aquarist friend has told me that a wired glass of the same thickness would make a more reliable bottom. Is this true?

What your friend has told you is quite true. The water alone in a 36 in. by 12 in. by 12 in. tank weighs approximately 225 lbs., so it stands to reason that a wire-reinforced glass is by far the better proposition.

To what size does the red-tailed black shark grow, and can the sexes be told apart?

Given plenty of swimming space in well-aerated water, the red-tailed black shark (*Labeo bicolor*) can attain a length of about 5 inches. So far as we are aware, the only way to tell the sexes apart is by the fuller sides of a mature female.

I have read that nylon mops can be used as a substitute for bushy-foliaged plants in a tank set aside for spawning certain carp-like fishes. Where can I buy nylon mops?

If you cannot obtain a nylon spawning mop from a local dealer, then visit your nearest supermarket or department store and, where the household cleaning requisites are sold, buy a nylon scouring pad. Unravel its tangled ribbon-like threads to make a loose mop, and then leave it to soak in warm water for a few hours before use.

I have been told that it is most unwise to introduce the plant called bladderwort (*Utricularia*) into a tropical tank because the bladder trap, and then absorb into the plant's tissues, the bodies of fish fry. Is this true?

The larger species of *Utricularia* do trap and devour tiny living creatures such as *Daphnia*, and very small fish fry, but the bladderwort with miniature bladders such as *U. gibba* is no danger to fish fry at all.

Will *Betta* *hadi* live on good terms with other fishes in a community tank?

As a rule, *B. hadi* does not go out of its way to molest fishes of a different species so long as they are not very much smaller than itself. All the same, *B. hadi* is not ideally suited to the rush and bustle of a community tank and always flourishes best when given a small aquarium to itself.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I was surprised to read in *The Aquarist* that trout could be kept in a small pond. Could you please give information on how this can be done?

It is possible to keep trout in a small pond if they are small ones and the water is quite pure. Trout prefer a well oxygenated water and unless this can be supplied it would not be worth trying to keep them. They are not fussy about food and though they like small live foods they will take dried food as well. A waterfall or fountain supplying the pond would be an advantage.

I have a tank 26 in. by 18 in. by 18 in. in which I have two golden oris (3 inch), two shubunkins (2 inch), two fantails (3 inch) and I would like to know if I can add to the number?

Your tank will hold about 27 inches and you already have 21. Do not add eels as they grow quickly and require plenty of oxygen and swimming space. You could add one or two fantails or shubunkins, but don't overdo it.

I have a pond in the garden 18 feet by 12 feet by 4 feet and would like to keep a duck or two. Which kind would be best and not eat the goldfish?

The trouble with ducks on a small pond is that they would have to be pinioned or they would fly away; they might eat the fish, especially the diving ducks such as pochards and tufted ducks. They would foul the water and as they eat plenty of vegetable matter they could damage or even destroy plants such as water lilies. Mallards or teal might be the best but I could not guarantee that fish might not be taken occasionally. Plenty of ornamental ponds in public gardens etc. have a good assortment of ducks and also fish and they seem to get by, but to try this out in a small pond is rather risky.

I have built a fish house 10 feet by 5 feet, and I have a few ponds at the bottom and side 24 in. by 15 in. by 12 in. tanks. I propose to use an oil heater to extend the breeding and feeding season. If I use a greenhouse heater burning a gallon of paraffin a week do you think this will be enough?

The lamp you wish to use will not be of much use to raise the temperature of your fish house. You would need a heater burning at least 4 gallons of paraffin a week to do much good. It is not a good plan to try to keep coldwater fishes too warm during the winter as many breed better after a long winter rest.

I have bought a goldfish and it has white splotches on its tail and ventral fin. Is there a cure for this?

The white showing on your goldfish may be just natural colouring. Many goldfishes are not gold or red all over, but have patches of white on them. This is not a disease and cannot be cured. Some fish showing this white will have larger patches each year as they age, and nothing can be done about it.

Can you tell me how to rid my goldfish pond of newts? My fish are nicely tame and I do not want to frighten them with a net. Is there a food which would attract the newts into a trap?

I do not think that you need worry over the newts in your pond. They come to the pond only to breed and spend the rest of the year on land. Once they have laid their eggs they will leave the water. They will not harm the fishes but will eat any worms given to these. If you are breeding goldfish you could get some trouble from the newt tadpoles, which hatch from the water plants and can not only eat the fine live food suitable for the goldfish fry but might eat the fry. You could wait at the pond with a net for the newts to come to surface to breathe, which they must do, or use a strong torch at night when the newts are at, or near, the top of the water at the sides of the pond, and net them then.



Photo: W. J. Howe
Crested newt, a temporary visitor to garden ponds in summer

I have a green perch in my tank which appears to have difficulty in swimming. Its head seems to droop, the tail rising with an arched back. It will dash about at times and then roll on its side. What is wrong with it?

This fish seems to be in a bad way, and I do not like the sound of an arched back. I would destroy this fish, as even if it could be cured there is no sense in keeping such a fish alive. In Nature any ailing or mis-shapen fish would be eaten by predators and never live to breed. However, you can give the fish a salt bath for a few days and then offer it small garden worms. If it does not take this food then do not keep it.

Can you tell me how to keep and breed *Daphnia* for feeding my fish?

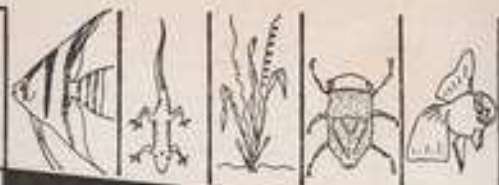
It is not easy to keep *Daphnia* for long and it is more difficult to breed them in any quantity. *Daphnia* soon die if the water lacks oxygen, as if they are kept in an overcrowded condition. It is no easy task to breed them and unless plenty of space is available then no success can be expected. The best method is to have two small ponds. Some manure or decaying matter is put in one and after a time plenty of algae and Infusoria will have formed. This is the food of *Daphnia* and when plenty can be seen a few *Daphnia* can be added. They will soon breed during the warmer months of the year. When plenty are seen they can be used for feeding. Some fresh water should be added to the pond occasionally. When the supply appears to be dying down, the second pond can be started with a few *Daphnia* from the first pond. This one can then be cleaned out and restarted with a fresh stock. When the weather turns cold the *Daphnia* die out but not before they have laid eggs, which remain in the pond until the following spring, when another stock will appear.

Cutting Down Glass Jars

THERE is nothing difficult about cutting down a glass preserve jar to make an excellent, non-toxic container for an aquarium plant needing a compost richer than plain, washed sand. To make such a container, all you have to do is to wind three or four turns of darning wool, or knitting wool, around the jar's middle, moisten the wool well with methylated spirit, and then set it alight. The instant the flames have died down, hold the jar under a dripping coldwater tap. The glass will then break right round where the wool was with a sudden crack. To make the cut-down jar safe to handle, blunt the razor-sharp edges with a few rubs of a carborundum stone.

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

Breeding Fighters

It has been my pleasure to have been an interested and admiring reader of your magazine for over 15 years. I have considered writing you on many occasions to convey my appreciation for the many fine articles and projects which you have permitted to be published in your magazine. It is therefore with great regret that I find myself directing this letter to you to protest at a most harmful over-generalisation and false simplification of advice as appeared in your March article, "Breeding Habits of the Siamese Fish", by Eric Friese.

I have been an ardent advocate of the *Betta* for over 25 years. I have bred, experimented with the *Betta* and won numerous trophies in some of the large exhibitions in my area during this period. I have had the singular honour of judging many fine fish at these exhibitions in the Eastern U.S.A. and have met many fine breeders of this fish and exchanged experiences over this period with many of them. I organised and founded the Brooklyn Aquarium Society some 9 years ago in an effort to give the average breeder accurate information on his specialty fish. Had Mr. Friese passed along this inaccurate and misleading advice at one of our meetings, he would have been very politely corrected and shown the error of his ways. I will make my points by quoting from Mr. Friese's article.

1. "Specific water conditions for the breeding of *Betta splendens* are not of any importance."

Betta in their native waters live in soft muddy bottom rice-paddies (mucky and amber tinged), slightly acid (pH 6.8). You just try getting them to breed in water with great amounts of dissolved minerals! They just don't fare very well. By all means use old water with the acid amber appearance developed with a controlled peat moss bag in a bottom filter. Add one-third of fresh demineralised water to this volume of old water.

2. "Water temperature should remain between 80° and 85°F."

Scientific studies have shown that more pairs of *Betta* will spawn with great success at exactly 80°F than at any other temperature.

3. "Consideration for certain colour variations are secondary. Normally the offspring of one pair of *Betta* shine in all colours of the rainbow—with one colour having slight predominance and present in some degree in the majority of the young. This dominating colour can be quite different from that of both parent fish."

I have no doubt that the results which are stated in the

second and third sentence of the above statement will be the actual results if the breeder of the *Betta* follows the advice given in the first sentence. All the patient work of dedicated breeders in developing pure colour strains of controlled genetic stock has been all but wiped out in the past few years by breeders who would follow this type of instruction. Soon we will be back to the short-finned, small-bodied fish of the early 1930's. How could we have developed large finnage, strong-bodied fish with true colour without controlling the matings? By all means I urge all *Betta* breeders to keep records and develop controlled stock of true line breeds.

4. "The labyrinth organ forms in young *Betta* about 3 to 4 weeks after they hatch. During this time excessive fluctuations of the temperature should be avoided since the young fish are somewhat sensitive to low temperature."

I agree with the above statement, only it stops short of giving the full facts. All spawnings hatch out over an extended period of some hours. It is therefore true that they also will grow at different rates and develop their labyrinth at different times. I would substitute 1 in. as the size of the fish for the period at which the labyrinth is formed. Also, it may be fine to keep the water temperature at 80°F but worthless unless the air space above the water is also controlled. A 15 watt bulb going day and night for this period will keep the surface at 80°F if the tank cover is tightly sealed. It is imperative to permit no oil, scum or dust on the water surface at this time of labyrinth development.

5. "*Betta splendens* thrive equally well on dried food as on live, but frequent live food feedings, especially with mosquito larvae, seem to promote better and more intense colours."

This is pure nonsense! Any experiment with two groups of *Betta* will show that a diet of live food will produce superior fish and a diet of dry food will create trouble. *Bettas* should be raised on live food supplemented by soft fresh meats and diluted vegetables. All this should be done under controlled conditions of cleanliness. It is impossible to feed dry food in the confined space of a glass jar without fouling the water and losing fish. Besides *Betta* have short intestines and frequent feedings of dry food tend to bloat and constipate them.

Only the colours which have been genetically transferred to the *Betta* offspring by their parents will be enhanced by feedings. Feedings of live food may increase the appearance of colours but it will never promote what was not genetically available in the specimen.

6. "Keeping young male fighters in jars close together produces specimens with fine large finnage."

Proper genetic breeding, nutritious and frequent fresh feedings and controlled environmental conditions produce large finnage. Putting Bettas in jars close together is no guarantee of long-finned specimens if Nature has not pre-ordained this result through the genes. A certain amount of exposure of males to each other is beneficial as exercise but over-exposure will wear out and weaken the specimen and distract him from feeding properly.

Mr. Friese mentions nothing about the height of the water in the tank, the amount and proper type of Infusoria to introduce optimum growth or the other foods available for the various ages of *Betta*. I believe this article is an unfortunate example of over-generalisation and false simplification which will lead to erroneous application of incomplete rules of procedure. We have enough trouble leading the reluctant bride *Betta* to what may be a disinterested groom *Betta*, not to speak of inexperienced males who treat mates abusively, so accept this abridged advice.

S. STEWART.

New York, U.S.A.

Resuscitation of Angels

WITH reference to the question posed by T. Rolan in *Aquarist's Notebook* (April), I came across his problem with angel fish, and I think I have found the answer.

When transferring these fish it is best to plant some plants from their old aquarium, in similar situations in their new one, and to transfer beforehand as much of their old aquarium water into the new one as possible. If the fish still begin their 'death dance' after these precautions, I have found from experience the best way to revive them is to keep them upright with a planting stick or any similar instrument, and to prod their tails with a finger and keep them moving.

After a while it will become noticeable that the fish are swimming of their own accord with intent to avoid the finger of their tormentor.

If after a few minutes this does not work, I suggest artificial respiration; this is done by gently clasping the fish about its middle and forcing water through its gills by a regular backward and forward movement in the water.

I have managed to save five out of six fish by this treatment.

M. R. TAPLIN,

London, E.14.

Fish Films

WOULD it be possible for you to publish these details of my film shows in your magazine? I find that Societies write to me requesting my services having seen details of my film programmes in copies of *The Aquarist* dated 2 or 3 years ago.

I am on the official list of F.I.A.S. lecturers but a good many Societies are not affiliated, thereby missing the chance of obtaining the services of a good many lecturers and judges.

Running time of the show is about 1½ hours, all equipment for the show is provided including sound on tape.

Films, 8mm.: *Tropical Aquarium Fishes* (colour); *Blue Gouramis Breeding* (black and white); *S. African Clawed Toad* (black and white); *Molluski-Fishing in E. Africa* (colour); *Fighting Fishes of Siam* (colour); *Cambridge University Botanical Gardens* (colour).

Films, 16mm.: *Hawaiian Mouthbreeders* (colour); *Stick Insects* (black and white); *Praying Mantis* (black and white); *Safari to Tractops* (colour).

I will travel any distance provided that I have enough annual leave to cover the time needed.

NORMAN MASON-SMITH,

42a Rustat Road, Cambridge.

Safety First

IN the interest of safety first with regard to electrical equipment used in aquaria, wouldn't you think it possible for tanks and stands, when manufactured, to have earthing lugs fitted to them? This would save fellow aquarists and myself the job of modifying tanks and stands, also the very unpleasant "shocks" received when water (unknown to the keeper) has penetrated into the heater or thermostat.

D. G. CAMP,

Wimbledon, S.W.19.

Calling the Continent

THE Coalville and District Aquarists' Society are interested in contacting an aquarists' society in Holland or Germany with the intention of forming a "twin" society.

We are hoping to correspond frequently with a similar society on the Continent, swapping ideas and information etc., and perhaps even to exchange visits between members of the two societies.

I don't know whether any other society in the country has experimented successfully with such a scheme, but we feel that such a step would enhance the interest in fish-keeping in this Society and, in fact, generally. Can readers please help by providing us with the names and addresses of one or two contacts or societies in the above countries, or put us in touch with someone who could?

J. A. REED,

Secretary, Coalville and District
Aquarists' Society,

Hobby Hall Cottage,
Coat Oak Road,
Markfield,
Leics.

A.S.L.A.S.

MANY of the new and some of the longer established fishkeepers, that are interested enough in the hobby to want to learn more, do not know of the existence of the many clubs and societies. In an effort to rectify this and bring more members into club life the Association of South London Aquarist Societies will be pleased to put any aquarist in contact with a local club.

It has also come to our notice that many aquarists in our own member clubs as well as other London clubs do not know what A.S.L.A.S. is. This is a very poor state of affairs so let us clear this point up straight away.

The Association of South London Aquarist Societies was formed in 1949 to foster and promote the progress of South London clubs. Since this time it has progressed and today to achieve its aim it offers to its members, free judges, lecturers and loan of tanks for shows; it prints its own monthly newsletter and quarterly journal to keep its members up-to-date with news and views, and holds an annual show at which members compete for trophies and awards. It also organises inter-club competitions and offers advice to club members on their fishy problems.

Recently we have started to expand our field of activities to bring in clubs out of the South London area and will be pleased to receive any inquiry from prospective members.

Within the Association we have many experienced members who are always willing to help fellow aquarists with their own particular problem, and it is hoped that you are not slow in coming forward with these problems—we all have them!

K. A. SAUNDERS,

Secretary, Association of South London
Aquarist Societies,

24 Barber Road,
London, S.W.11.

Leeches

LEECHES of one kind or another sometimes turn up in the fish tank. They are usually introduced on plants taken out of a lake or canal and put straight away into the unheated aquarium, or with live food or with water snails collected from the wild.

It is not easy to mistake a leech for any other aquatic creature because it looks like a muddy or blackish worm widening into a bulbous swelling at one end. Contracted it resembles nothing more than a darkish bud or nipple. Fully extended it has a somewhat ribbon-like shape.

The leech swims through the water with undulating motions, or progresses over the plants or the sides of the aquarium with curiously fascinating looping movements. It usually spends its days hidden away under stems or in the mulmy crowns of plants. But at night it becomes exceedingly active.

Few leeches which show up in our aquariums attack the fished inmates, though in all probability all leeches will make a meal from tiny quiescent fry or fish eggs. But there are leeches of the families Rhynchobdellidae and Gnathobdellidae which are demons for blood, and when they attach themselves to a small fish they will, if not quickly removed, soon reduce its vital juices and generally set the scene for its rapid demise, or slower death by sporozoon disease.

If there is one thing that leeches dislike above all else it is salt; so to remove a leech from a fish's body all that is necessary is to catch the fish and douse the pest in strong

salt water (apply it by pipette or camel-hair brush preferably). The leech's suckorial powers will then be put out of action and the creature can either be wiped off the fish or lifted away with tweezers. Whatever you do, don't attempt to pull a leech off its host without first paralyzing its sucking apparatus, because if you do serious damage will be done to the skin of the fish.

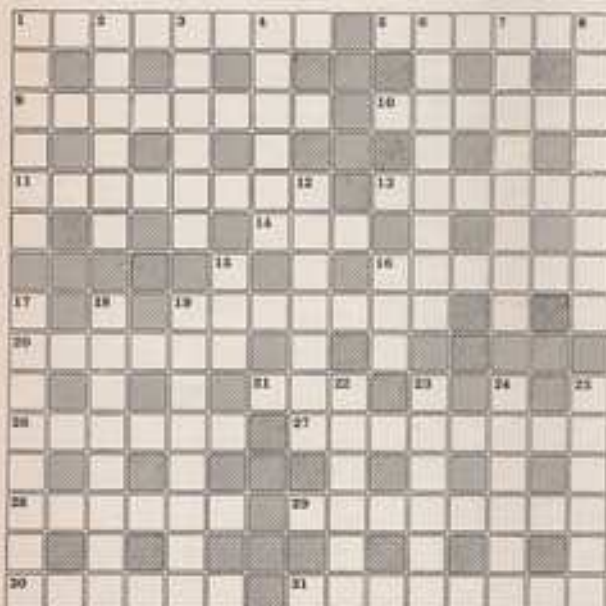
If you have seen a leech in your aquarium and it has disappeared into hiding before you have had time to capture it, the best thing you can do is to hang a small piece of red meat in the tank just before dark, and some time later revisit the aquarium with a flashlamp. If you see the leech feeding on the meat capture it before it gets a chance to zig-zag into the shadows. Sometimes an inverted egg-cup or small saucer stood on the sand makes a good leech-trap. In conclusion, to avoid introducing leeches into the aquarium on plants, always treat them first in a deep pink solution of potassium permanganate (or seven or eight drops of Condy's fluid stirred round in a pint of water).

Cacti in the Fish House

ONE of the cactus genera most easily brought into flower is the genus *Notocactus*. These plants are fairly small and a plant an inch across can have a dozen flowers at the base, each an inch or more across. Many of the *Mammillaria* will flower when only a year old. The genus *Notocactus* contains some species which flower very well, often with flowers over 2 inches across. One of the best is *Notocactus orizabae*.

The AQUARIST Crossword

Compiled by L. BRADLEY



CLUES ACROSS

- Plant of genus *Lemna* (8).
- Tapering ice formation (8).
- Flower (5).
- Covered walk (6).
- Alveopora* *macrophylla* (8).
- Preservation of green fodder (6).
- Flat fish (3).
- Larva (8).
- Pendant (7).
- Red ale (ANAG.) (6).
- and legs (5).
- Design the French heavenly body (6).
- See 17 down.
- Beast (6).
- Where the angel fish is found? (8).
- Essays (6).
- Stony bank below ground level (8).

CLUES DOWN

- Variates a lot of fruit (6).
- Loamy? (8).
- Carnivorous quadruped allied to weasel and ferret (8).
- Rehatched because it is so idle (8).
- Pendulous member of the aquarium (8).
- Fish distinguished by having teeth and adipose fin (8).
- Seed seen (ANAG.) (8).
- Crysalis from willow bark (7).
- Do bacteria drink beer? (5).
- Practised at the 15 down (3).
- 17 and 27 across. *Gnathostomus petersi* (S.A.S.) (8).
- White spot is a protozoan example of this (8).
- 4 down, minus 500 (8).
- Musical composition (8).
- Recess (6).
- Break up (6).
- Mentise (8).

Solution on page 28



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

THE Belle Vue A.S. recently held its Annual Open Show and the results were as follows: Cichlids—1, J. Healey (Crawley); 2, A. Hickson (Belle Vue); 3, A. and F. Stanforth (Crawley). A.O.V. (Males)—1, T. Mitchell (Mansfield); 2, M. Davis (Derby); 3, A. and F. Stanforth (Crawley). Dwarf cichlids—1, W. Taylor (Stratford); 2, M. Davis (Derby); 3, B. Hughes (Belle Vue). A.O.V. cichlids—1, S. Baker (Belle Vue); 2, A. R. Wilkie (Stratford); 3, S. Knowles (Crawley). Fishes—1, A. R. Wilkie (Stratford); 2, W. Nottingham (Belle Vue); 3, A. Gardner (Stratford). Anabantids—1, H. Muller (Mansfield); 2, D. Thomas (Mansfield); 3, E. Fletcher (Belle Vue). Small barbys—1, P. Bennett (Crawley); 2, F. Gregory (Osneston); 3, J. Robinson (Mansfield). Large barbys—1, K. Harlow (Mansfield); 2, M. Davis (Derby); 3, F. Muller (Mansfield). Characins small—1, K. Thompson (Belle Vue); 2, F. Muller (Mansfield); 3, A. Harper (Mansfield). Characins large—1, M. Davis (Derby); 2, R. Scamper (Mansfield); 3, F. Muller (Mansfield). Geys and Minnows—1, M. Davis (Derby); 2, E. Fletcher (Belle Vue); 3, K. Hughes (Belle Vue). Killifish/Rabbits—1, K. Williamson (Osneston); 2, G. Richardson (Belle Vue); 3, J. Allen (Tropic Breeders). Labrids—1, F. Muller (Mansfield); 2, P. Huntington (Osneston); 3, W. H. Smith (Mansfield). Loaches and fish—1, M. Davis (Derby); 2, J. P. Davey (Osneston); 3, M. Hutchinson (Belle Vue). Pomatoe loaches—1, J. and A. M. Davis (Derby); 2, K. Williamson (Osneston); 3, K. Williamson (Osneston). A.O.V.—1, B. Hughes (Belle Vue); 2, M. Davis (Derby); 3, R. Answorth (Mansfield). Junior—1, Miss R. Davis (Derby); 2, B. Parkers (Mansfield); 3, A. B. Cain (Mansfield). Goldwars—1, Mrs. B. Williamson (Heywood); 2, W. H. Smith; 3, T. Mitchell. The best in show award went to Mr. B. Hughes (Belle Vue) and the best breeder to Mr. G. Richardson (Belle Vue). There were 13 societies competing and 214 entries were booked. The judging was carried out by Mr. A. Blom and Mr. G. Waller.

On Tuesday 11th April an Inter Society competition was held with Mansfield A.S. 20 fish from each society were booked. Belle Vue was the first of these Annual matches gaining 199 pts. to 154. Mr. G. Thompson (Belle Vue) won the Best in Show award. During the evening a very interesting and closely contested quiz was held. Belle Vue again lost gaining victory. Any new members and visitors are always welcome to the monthly meetings held the first Wednesday in the month in the Palm Court Restaurant, Belle Vue, Hyde Road, Manchester at 7.30 p.m.

THE annual general meeting of the Federation of Cichlid Breeders Societies was held recently and the following officers and officials were appointed: President, R. Forest Jones, Esq., E.S.S. (Three Counties section). (Mr. Forest Jones was also elected a Fellow of the F.O.B.S. in regard of his outstanding service and devotion to the Federation, and his many and varied contributions to the aquarist hobby as a whole); hon. general secretary, M. H. Delong (South Midlands section); "Wife Club", T. Herbert, Dryditch, Wrexham; hon. treasurer, A. Lindley, Esq. (North Midlands section); hon. secretary, J. B. Myers, Esq. (Eastern Counties); Hon. journal editor,

E. G. Fraser, Esq. (North Midlands section); hon. librarian, W. Myers, Esq. (Eastern Counties section); chairman, judges and secretary committee, R. Forest Jones, Esq., E.S.S., F.F.G.B.S. Management; W. G. Baker (Provincial); L. B. Parks (North Midlands); K. Court (Ireland and Bath).

THE Mabley A.S. recently held an inter-club show with the Brith, Sittingbourne and Canterbury societies. There were over 50 first-class entries and while the judging was taking place two excellent films on exotic goldfish and tropical marine life were shown. The results were as follows: Anabantids—1, Mr. Johnson (Mabley); 2, Mr. Richard (Sittingbourne); 3, Mr. Jones (Sittingbourne). Barbys—1, Mr. Gammon (Canterbury); 2, Mr. Osborne (Sittingbourne); 3, Mr. Giles (Sittingbourne). Characins—1, Mr. Harding (Leitch); 2, Mr. Giles (Mabley); 3, Mr. Mann (Leitch). Labeocharacins—1, Mr. Johnson (Mabley); 2, Mr. Hillier (Mabley); 3, Mr. Payne (Leitch). The overall result was: Mabley 18 points; Sittingbourne 18 points; Brith 11 points; and Canterbury 7 points. Meetings are held on the second and fourth Wednesdays of each month at Histon, Histon, New Road, Chatham, commencing at 7.45 p.m. and new members will always be warmly welcomed. Secretary: C. F. Soper, 138 Boundary Road, Chatham.

THE results of the recent table show of the Kingston and District A.S. were as follows: A.V. cichlid—1, B. Cooper; 2, D. Ellis. A.O.V. (small)—1, J. Greenfield; 2, D. Ellis; 3, R. Struss. In an effort to ease the work of the secretary, which has proved to be a big job for one person to accomplish properly, the society decided to elect a press officer, and a public relations officer. The former secretary, Charlie (Tony) said that he would be prepared to combine both jobs if the Club agreed, which they did.

THE Guildford & District A.S. welcome new members and have a full programme for this summer with different outings in and around Guildford. The new hon. secretary is Mr. D. Nottingham, 18 The Oval, Guildford, Surrey.

THE North Warwickshire A.S. continues to flourish and now has over 50 active members. At a recent meeting, Mr. D. Letchman a founder member of S.A.S.S. came and gave a talk on show standards, how points are allotted and how to condition fish for showing. Mr. Eglington, also from S.A.S.S., came to judge a table show of barbys, the results being as follows: 1 and 2, V. Rogers; 3, H. Willett. Mr. Eglington gave a very detailed summary on each fish entered which was very much appreciated by all members.

At the mid-monthly meeting Mr. D. Bennett gave a talk on keeping, feeding and rearing teleosts and Mr. P. Rogers a talk on electricity in the hands of the aquarist, a talk which proved most enlightening and beneficial. Both are members of the Society.

Meetings are still held on the last Wednesday in the month and in addition a meeting is held on a Wednesday in the middle of the month. New members will be very welcome at the Settlement, Kingswanton Road, Kingswanton, and should write to the secretary, L. W. Main, 490 Kingswanton Road, Kingswanton, Birmingham, if they require further details.

AT the last annual general meeting of the Nottingham & District A.S. Mr. J. Ezzam was elected the new breeders section secretary. His deputy is Mr. B. Chambers. The meetings are on the second Tuesday in the month at Palm House, Peckham Street, Nottingham, and the aim of this section is the breeding of fish and plants and raising judges. Any other club secretary interested in the same lines please contact the secretary at: 72, Sherwin Road, Lenton, Nottingham.

AT the first March meeting of the Basingstoke and District A.S. it was decided to run a trip to Kew Gardens, on the 23rd May. Mr. J. Goddard and Mr. J. Pearce undertook to make the necessary arrangements. The chairman had pleasure in announcing that the club president, Mr. R. Forest Jones, had been made a Fellow of the F.O.B.S. An interesting talk on fish diseases was given by the president, which was a great help to some of the newer members. The results of the table show for barbys was as follows: 1 and 2, Mr. A. Lowe (royal barb); 3, Mr. B. Part (royal barb).

At the second meeting in March, show schedules were available for the Three Counties Open Show to be held at Basingstoke on the 29th May. Schedules can be obtained from R. Forest Jones, Esq. E.S.S., F.F.G.B.S., 5 Park Lane, Old Basing, Basingstoke. Besides the Three Counties Trophy the Beaulieu Trophy and the Moore Trophy will be open for competition. The president reported on his trip to the Isle of Wight Society to whom he gave a talk and an interesting talk was given by Mr. T. Wilkinson, of High Wycombe, on the various uses of equipment that he had made. The results of the table show for livebearers, which was judged by the speaker was as follows: 1, Mr. A. Lowe (Swordtail); 2, Mr. E. Lacey (platy x macra); 3, Mr. T. Woodwood (Guppy).

THE well-known plant expert, Mr. Kestinsky, gave a lecture and slide show to members of the Hounslow and District A.S. recently. Among many points mentioned was the effect that fluorescent lighting has on plants. The Hounslow society had the honour of entertaining the Isle of Wight society when they paid a return visit to Hounslow for the second leg of an inter-club show which was comprised of six classes. The result was a win for the local society by 51 points to 4. Anabantids: 1, Mr. Part (grey gaurami); 71 pts.; 2, Miss Chris Smith (grey gaurami); 60 pts.; 3, Mr. Woodward (kissing gaurami); 60 pts.; Barbys: 1 and 2, Mr. R. Luff (steel barb) and cyprinoids barb; 73 pts.; 3, Mr. Woodward (blue barb); 73 pts.; Goldfish: 1, Mr. Webb (oldspine morone); 73 pts.; 2, Mr. Thoen (severum); 72 pts.; 3, Mr. Davidson (I.O.W.); (Angel); 69 pts.; Characins: 1, Mr. Webb (anostomus anostomus); 78 pts.; 2, Miss Chris Smith (Surpae); 74 pts.; 3, Mr. Davis (I.O.W.); (rasbora); 73 pts.; Guppy: 1, Mr. Patrick; 69 pts.; 2, Mr. Stevens (I.O.W.); 69 pts.; 3, Mr. Davidson; 68 pts.; Livebearers: 1, Mr. Cain (Simpson award); 78 pts.; 2, Mr. Barber (Marigold platy); 75 pts.; 3, Mr. Luff (red swordtail); 74 pts. The Hounslow society rose quart on Wednesdays, fortnightly, at the Trematol Army Centre, Harworth Road, Hounslow.

THE Nelson A.S. held their 5th open show in the Romney Ballroom, Nelson, recently. There were 237 entries with 18 societies competing and Mr. Mallinson, F.N.A.S. of Burslowwick and Mr. Clapp, F.N.A.S. of A.V.A.S. were the judges. The award for the best fish in the show went to Mr. Davidson of Derby and the section winners were Mr. Bibby (Barley) (two sections), Mr. W. Taylor (Gurami), Mr. Wilkinson (Haffoc), Mr. Davidson (Derby) (four sections), Mr. Muller (Mansfield) (two sections), Mr. Harrison (Auriborough), Mr. Williamson (Osneston), Mr. Roe, Dickens (Nelson), Mr. Wolstencroft (Heywood), Miss Davidson (Derby).

THE Bracknell A.S. held their annual general meeting recently, when a successful year was reported and officers elected as follows: Chairman, I. Jordan; secretary,

K. Phillips, 40, Pendennis Road, Blackhall, treasurer; C. Dixon—Committee: D. Dove, T. Duffy, P. Doty, Mrs. L. Jordan. The Home Aquarist Cup, presented by D. Dove, was won by J. Peters who also won the Aquarist of the Year Cup, presented by J. Norris.

The Blackpool Open Show will be held on 23rd September, in the Victoria Hall, Blackpool. The club meets on the first and third Thursdays each month except August. New members will be made welcome, also old members. The society meet at the Red Lion Rooms, High Street, Blackpool.

FOR the first meeting of the Blackpool & Fylde A.S., in March, an auction was held. Under the rules of the auction 10% of the price the article brought went to the club, but most members gave the whole proceeds.

At the second meeting Mr. Vic Fleckner, a vice-president, presented the Junior trophies, the fish of the Year going to Alastair Keith Gouss. This was followed by a talk given by Mr. Norman Hadley on goldfish, with the help of an episcopus, and proved most interesting when Mr. Hadley brought a feature showing photographs of variety shows of the club and Belle Vue, also founder members of the club. To members who have not been in the club a long time the difference of the shows proved that this hobby is one of hard work and much imagination to keep alive the growth of fishkeeping and the clubs. Visitors can be assured of a warm welcome and should contact G. Howard, Secretary, 58, Sandford Avenue, Blackpool.

DUE mainly to the recent increase of membership over the past months, the Independent A.S. open-auction show for coldwater classes, held in March, produced a larger number of exhibitors than was anticipated, and at the final call-over there were over 50 entries. This show followed a lecture given the previous week on coldwater species by Mr. F. Riddle, and it is hoped that the interest now being shown in keeping foreign and native coldwater species will continue to increase, as in the past these classes have been poorly represented at shows. Results were as follows: British native and foreign coldwater: 1, 2 and 3, Mr. J. Kettle; 4, Mr. J. Clark. Common goldfish: 1 and 2, Mr. J. Clark; 3, Mr. J. E. Chapman; 4, Mrs. Ratcliffe. Fancy goldfish: 1, 2 and 4, Mr. J. Kettle; 3, Mr. L. Edney.

Following the Whitsun holidays the club intends to stage a best pairs competition (Male and female fish), a lecture on live foods by Mr. Arnold, the well-known food culture expert, and a table show for plants, birds, insects and conyroids etc.

If any prospective fish keeper is interested in the above, the Independent A.S. cordially invites them to pay a visit any Monday evening at 7.45 p.m. For details ring Mr. F. Tomkins, ANC 0860.

THE Uxbridge & District A.S. invited High Wycombe along to enjoy the benefit of a lecture on coldwater fishkeeping by Mr. A.

Booster, at one of their recent meetings. A verbal account of interest by club members had been evident in recent months and, judging by the questions put to Mr. Booster, it may be safe to assume that this interest has now been encouraged a stage further. There is the likelihood of a coldwater section being started in the near future if through enthusiasm it materialized.

Members brought their prize fish along when club member Mr. Handy gave a demonstration on fish photography. Mr. Handy arranged a specially constructed tank with an adjustable focussing device which enabled fish to be photographed almost on studio lines. These studies will be shown during one of the winter meetings when the subjects will be discussed and their merits assessed.

More recently a number of members visited High Wycombe as guests at a table show they staged and were most pleasantly entertained by lavish hospitality. It was remarked that if High Wycombe feed their fish as they do their guests, Uxbridge will be in for some stiff competition when they meet High Wycombe on 28th May.

AT a meeting of the Tottenham and District A.S., it was agreed that, due to the lack of facilities for showing coldwater fish, an open show would be held on 3rd and 4th September, at Woodside Park, Wood Green, for coldwater species, and that this show will be the coldwater section of the annual Tottenham show which will be held on a date to be fixed. Further details will be available in the near future.

The club meets regularly on the second and fourth Thursdays in the month at the T.L.R. club in Tottenham High Road. Any persons interested in furthering their hobby, will find a full and interesting evening consisting table shows, discussions, and lectures.

RECENTLY at the Thurrock Aquarist Club meeting, the show secretary, Mr. E. Wood, gave a talk on handling the wagg scorpion. He gave information on all types of set-ups for breeding barbs, danios, swordtails, etc. It was an extremely good and interesting talk and much appreciated by the younger members of the club who are on the threshold of handling these fishes. At the next meeting the chairman, Mr. R. Nicholas, gave a very interesting talk on algae, with some useful tips on its control. In addition there was a table show for A.O.V. trophies for which there were 17 entries. This class was judged by Mr. P. Hockley and Mr. B. Barber, and the results were as follows: 1, Mr. R. Nicholas, 23 pts. (male loach); 2, Mr. B. Tasker, 17 pts. (female guppy); 3, Mr. D. Durrant, 13 pts. (male thich-top).

THE Feltham A.S. is holding their 5th open show on Saturday, 3rd July. The Society are hoping that aquarists in London and S.E. England will come along to support the show. Entertainment, refreshments and a 'Club Shop' will be amongst the many attractions. Show information and information can

be obtained from the show secretary, M. R. Thomas, Esq., 34, Benetford Road, Coofton Park, London, S.E.4.

AT the February meeting of the Lisarvis Major A.S. members enjoyed a talk by Mr. P. Scophar, on different methods used to keep fish in the home, during the early days of fishkeeping. Members from Barry and Cardiff societies enjoyed the hospitality of the members, watching the coloured slides, with a 1936 recording, on collecting brine shrimp and brine shrimp eggs in Arizona. This programme was held from the Hoodon society. The results of the April show were as follows—Egg-layers: 1 and 2, A. Ibbertson; 3 and 4, K. Farran and 4, J. Sanders. Livebearers: 1, A. Ibbertson; 2 and 3, J. Sanders; 4, K. Farran and 5, M. Marchey.

AFTER a very successful first year Stone A.S. held an annual dinner and prize presentation. The chairman, Mr. C. G. Brindley, reported that the society had come a long way since its inception and with a membership of over 30 it had been possible to hold meetings twice monthly.

At the annual general meeting in March the following officers were elected to serve during 1955. Chairman, Mr. C. G. Brindley; vice-chairman, Mr. B. G. Langley; secretary, Mr. C. Barlow, 16, Almslow Way, Walton, Stone, Staffs.; ass. secretary, Mr. P. N. Christie; social secretary, Mr. P. Harding; show secretary, Mr. K. J. Harvey; committee, Mr. M. Fink, Mr. C. Cartledge; Auditor, Mr. L. P. Carrin. The club holds meetings on the second and fourth Tuesdays of every month, the further details write to him, secretary.

NEW SOCIETIES

ON the 29th March, a new society, known as the Huddersfield Tropical Fish Society was formed. The officers elected were: Chairman, Mr. E. Webster; vice-chairman, Mr. I. Binner; treasurer, Mr. J. Potts; secretary, Mr. J. B. Wain, 960, New Hey Road, Gadsden, Huddersfield. Meetings every second Monday at 8 p.m. at Waverley Hotel, Manchester Road, Huddersfield, Yorks.

OVER the recent months an aquarist society has formed in Worcester, under the name Worcester A.S. Meetings are held every other Thursday evening at the Labour Club, New Street, Worcester, commencing at 8 o'clock. Any aquarist, old or young, experienced or otherwise, can be assured of a warm welcome, and should contact Mr. P. Price, 64, Bankwood Hill, Worcester, secretary.

Crossword Solution

D	U	C	K	W	E	E	D	I	C	I	C	L	E
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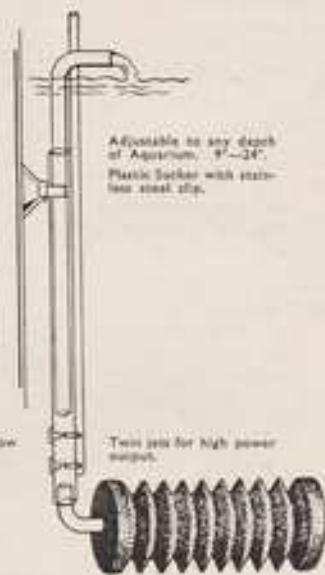
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