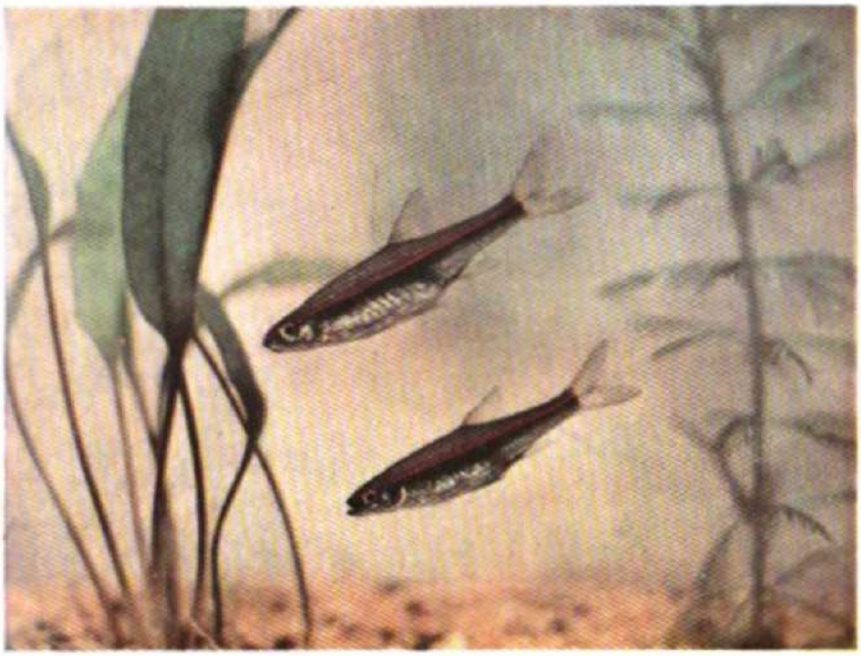
February 1958 *Two shillings*

FISHKEEPING

and Water Life



RED-STRIPED RASBORAS (*Rasbora pauciperforata*)

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VOL. 13 NO. 4
NEW ISSUE
FEBRUARY 1958

FISHKEEPING
and Water Life

IN THE SWIM

Variety at Olympia · Overseas Visitors · Above and Below · Beware of Copper · Big Barb's Popularity · Hungry Crabs

• **Backward glance.** The 1958 National Exhibition of Cage Birds and Aquaria at Olympia had an attendance of well over 24,000 in three days and more variety in the Aquaria Section than for some time.

The discerning aquarist was able to view the new Mock-metallic and Pseudo-matt Goldfishes, pictured in our last issue and again referred to by Miss D. Morris on page 189. There were also home-bred Neon Tetras and Black Angel Fish, American Guppies and the Veiltail Angel Fish of recent introduction.

• **From afar.** One of the principal delights of the Olympia show is the opportunity it gives for aquarists from near and far to meet. Long distance travellers this time were Ulf Hanoertz, the young Swedish aquarist who last year won £700 on Swedish television by answering questions on fish subjects, and Herbert R. Axelrod and Henry M. Arak from the U.S.A.

Nearer home, but still travelling a good distance, were representatives from Sunderland, Nottingham, Newcastle-on-Tyne and Bournemouth.

In the list of exhibitors we had the stalwart Portsmouth A.S. which carried off a third in club tropical furnished aquaria and a fourth in the club coldwater class. H. V. Jenkins' Shobonkins, all the way from Glamorgan, proudly swam around their show tank with a red prize ticket affixed. A fitting reward for their exhibitor's enterprise.

• **Variation.** An interesting judgment in the club tropical furnished aquaria was first place for an aquarium with a lowered water level to simulate the bank of a pond or stream. Moisture-loving plants grew above the water line whilst below were the customary submerged subjects.

We had this style of exhibit at Olympia for the first time last year when a similar aquarium was in second place. This time it took premier position. The exhibitors had corrected last year's mistake of using rockwork that was too overpowering.

When such an entry, unorthodox by normal aquarium standards gains first prize, it is bound to excite comment. I, for one, thought the design beautifully executed, though some

Three enthusiastic Goldfish fanciers pictured at Olympia. Left to right, W. Ducre (Lanark, M. Welch (Derby) and R. Birkenhead (Ilford, Essex).

have asked whether such a set-up is in the spirit of furnished aquarium competitions.

This seems a point that could be considered at the next judges' conference of the F.B.A.S. But I should like to put in a plea that we do not become so hide-bound by rules and regulations that scope for originality is lost entirely.

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● **Coining trouble.** In the cellar fishroom of Larry Kelleher there was a 45-gallon aquarium to which this aquarist introduced Guppies. They bred unmolested and periodically the surplus fishes were disposed of to a local store. A very convenient arrangement.

But then Mr. Kelleher looked at his tank again and saw there was a ½ in. gap between it and the cellar wall, an ideal place to pop down odd copper coins—a ready-made money box, in fact.

A little later the Guppies began to die; soon all were dead despite efforts to save them. There seemed no clue to what had killed them until the gravel was taken from the tank. Among it two pennies were found. It was copper poisoning.

A mishit with just two coins had resulted in the loss of a tankful of fish. Which makes Mr. Kelleher's story (recorded in the *New Zealand Aquatic World*) just about the most expensive tale of thrift I have heard for a very long time.

● **Barb popularity.** One of the unpredictables among new fishes has been the Tinfoil Barb (*B. schwanenfeldi*). In 1956 it was well in evidence on the show bench as befitted a new fish of attraction. I think if we are quite honest, though, we would agree that there have been other new species equally pleasing to the eye that have not caught on to anywhere near the same extent.

This fish seemed to be around in just as

H. C. Parsons of Aldershot showed this team of home-bred Black Angels at the Olympia show.

great numbers in 1957, a significant fact when it has yet to be bred in Britain. Certainly it shows well, responds most satisfyingly to good feeding and is very pleasing in a not unduly spectacular sort of way, but it is big, very big, by aquarium standards and that has spelt obscurity for many other tropicals.

But, when all is said, I must confess a real liking for the species for no better reason, I think, than for its clean contour and colour. Maybe others think similarly, and that is the reason why it is not being allowed to disappear into the limbo.

● **Marine interest.** Although it did not catch the judge's eye at Olympia last month, the marine aquarium set up by the Brockley Breeders' Circle in the club coldwater furnished aquarium class, proved a top attraction with the visiting public. Jim Vosper, secretary of this Breeders' Circle, was stewarding near at hand and was able to assure aquarists that keeping rockpool creatures, such as the crabs and anemones in the exhibit, was not difficult.

High spot, Mr. Vosper tells me, was when he fed the crabs with a meat sandwich on the Saturday afternoon. They responded excellently despite having gorged mussels earlier in the show. This was the first attempt by Brockley B.C. to show a large seawater tank and they were well pleased with the apparent interest in this branch of our hobby which has unlimited possibilities.

● **Colourful rockwork.** During the Olympia exhibition I met Capt. S. G. Klein from Tanganyika who had just brought to this country samples of ruby-bearing rock which actually form the weathered surface material from ruby mines in Tanganyika.

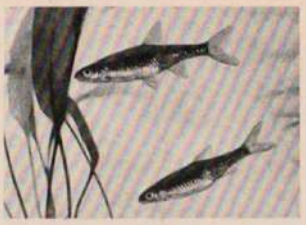
The colour of the material is red, green and black and it might have possibilities for aquarium decoration.

It is important to mention, however, that the rock has yet to be tested to find whether it is inert in aquarium water. Should this prove to be so it could then be made generally available to fishkeepers in this country and America, but its cost is likely to be quite high.

● **TV view.** In the chill days of mid-January, our hobby was represented on B.B.C. television twice in a week. First there was Mr. G. F. Boyce (South Western Aquarists) who, on children's television, told of the delights of tropical fishkeeping.

Two days later Capt. L. C. Betts appeared on the Twice Twenty Women's programme giving information on the correct culture of coldwater fishes, and he also made passing reference to tropicals. Mr. J. Goodman (Chiswick Aquaria) provided the fishes, etc., for Capt. Betts' appearance.— L.W.A.

TRY YOUR SKILL WITH RASBORAS (2)



Red-striped Rasboras, Rasbora pauciperforata, *which grow up to 2¼ in. long. Photograph taken by G. J. M. Timmerman.*

BETTY ROBERTSHAW tells how our cover fish, the Red-striped Rasbora, was spawned

THE spawning of the Red-striped Rasbora (*R. pauciperforata*) I had was more accidental than planned. The fish were a single pair at least four years old, and numerous attempts had been made through the years to spawn them. There was little difference in their body shape and doubt had crept in several times as to whether they were even a pair.

On this occasion there was a spare tank which happened to contain a peat bottom layering and softish water. It was full of odd scraps of *Cryptocoryne* plants and runners which were unplanted, and there was no swim space at all.

The parent fish were put in this tank with water readings of *p*H 6.7 and 88 p.p.m. hardness. On the second day the fish were noticed pushing through the plants and a great deal of side-by-side wriggling was going on.

Careful inspection of the tank showed no sign of eggs, but after half a day of this behaviour the adults were removed. Still no eggs could be seen. About a week later one or two fry were observed free-swimming in a bottom corner of the tank. They were fed Brine Shrimps which they took readily and very large quantities seemed to be consumed.

After three weeks the *Cryptocoryne* roots and shoots were removed, and it was seen that quite a number of fry were in the tank. The fry were moved after another week and counted in the process. There were 250 youngsters, all of which were raised to adults.

The *Rasbora* spawnings reported in my last article on this page took place in quite small tanks—16 in. × 8 in. × 8 in. In every case they were about two-thirds filled with water.

Tolerant Fishes

The temperatures were around 78 deg.F. and limited aeration in the orthodox manner was provided. When the fry were transferred at about four weeks of age they were netted out of varying waters and dropped straight into an ordinary furnished tank set up with hard tap water, but this did not appear to cause them the slightest discomfort.

It is difficult to arrive at any general conclusions from my results, but if does seem probable that soft and acid water might produce a distinct spawning urge in Rasboras, and it is notable that in the case of two of the species spawning was not completed on a single day but continued over a period.

Unfortunately one of the pair of *R. pauciperforata* did not survive for many days after being removed from the spawning tank, and we were unable to obtain any further information about the length of the spawning period at that time. In each of the instances given a single pair only was concerned, although opportunity of a shoal spawning was only provided in one instance. It is, however, quite possible that, after all, the use of a small shoal is of no particular advantage when breeding Rasboras.

From My Experience . . .

by R. W. ANDREWS

JUST after the war, when aquarists' requirements were still in very short supply, a friend called on me bringing a gift of two vivid red Ramshorn snails, which at that time were a definite novelty. This fact persuaded me to go against all my fishkeeping experience and I placed them in a living-room show tank to add a touch of colour, my thought at the

One of the hardy Ophiocephalus *species of fishes which, though interesting, are very pugnacious and unsuitable for a mixed collection. Photograph, W. Hoppe.*

time being that I would confine the snails to this one special aquarium. But nowadays I try to smile when visiting friends, after viewing my tanks, congratulate me on being the champion breeder of red snails!

I have never deliberately transferred any of the snails to another tank and, even when setting up a brand new aquarium, I have spent hours going over plant leaves with a magnifying glass to remove the snail eggs, yet the "red devils" eventually appear.

I did manage to keep the snail population to a minimum for a period of about two years, however. This occurred whilst I was maintaining a tank of Puffers and Scats. These fishes will eat crushed snail until they nearly burst and the resulting growth of the fishes made it a pleasure to go snail hunting. In conclusion, may I add that apparently my snails only retain their vivid red coloration by being fed on purchased *Tubifex*!

On the Prowl

Most aquarists take a pride in maintaining at least one show tank and hereby hangs the sad experience of a Midlands fish fancier. He acquired two unidentified, newly-imported fish of a medium size and believing them, by their appearance, to be of a scavenging type, placed them into his show tank which contained a shoal of young Neon Tetras. After a few days he became aware that his Neons were reduced in numbers and a close watch soon disclosed that the new fish were indeed responsible.

My friend, John Rudkin of Leicester A.S., moved the culprits and, knowing my interest in unusual fishes, passed them on to me, to be eventually classified as *Ophiocephalus obscurus* a near relative of the Snakeheads. On inspection the fish showed an elongated body, their large flat-topped head having a very wide mouth, above which a pair of fleshy horns stood out. These horns were, in fact, the anterior nostrils. The overall coloration was dark buff marked with irregular black patches.

The fishes' general appearance and movements are strikingly snake-like, another point being an apparent ability to take in atmospheric air. The fish do not appear to be of an active disposition, spending nearly all of the time lurking—as opposed to hiding—either within a flower pot cave or amid the plant thicket, their large eyes alert to every movement inside or outside the tank.

This latter sense becomes most marked when *Tubifex* is dropped in the tank when the immediate reaction of the fish is to dart forward, their cavernous mouths engulfing the worms in a rapid snatch, and then they make an equally swift retreat back into cover again.

I do not believe that the *O. obscurus* grows as large as the Asiatic Snakeheads, which fish incidentally I understand the Chinese used to drive out devils. Be that as it may, my species certainly ignore the previously mentioned "red devil" snails!

Prizewinning Aquarium Designs at Olympia

Roy Skipper photograph

First in the Inter-club Coldwater Furnished Aquaria

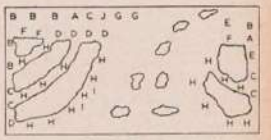
THE base of this furnished aquarium consisted of ½ in. well washed aquarium gravel. The rock used was bright red, brought from the banks of the River Dart.

Five medium-sized and seven small pieces of rock were introduced to create a small path leading from the front to the back of the aquarium, the larger pieces of rock being placed one on top of the other to give a step effect. Three pieces were employed in this fashion on the left and two on the right, with Willow Moss growing in between them.

In the planting, commencing at the front left-hand side, a small clump of Moneywort (*Lysimachia*) was used and behind that was Hornwort, *Egeria densa* and *Ludwigia*. Working along the back we had *Lagarosiphon major* (*Elodea crispa*), Hornwort, *Potamogeton* and Giant Sagittaria, in that order. In front of these plants was a line of Moneywort giving another contrast in colour.

On the front right-hand side Hornwort was planted and behind that *Myriophyllum*, *Lagarosiphon major* (*Elodea crispa*), *Egeria densa*, *Ludwigia* and then another clump of *Myriophyllum*. Two small Spatterdocks were also used in front of the rockwork on the right-hand side.

The two fish introduced were Bristol Shubunkins bred in May 1956.—J. H. FRANKLIN.



A = Lagarosiphon major. *B* = Egeria densa. *C* = Hornwort. *D* = Moneywort. *E* = Myriophyllum. *F* = Ludwigia. *G* = Giant Sagittaria. *H* = Willow Moss. *I* = Spatterdock. *J* = Potamogeton.

Leading Exhibit in the Class for Individuals

THIS year was my third attempt in the individual furnished aquarium class at Olympia and, profiting by mistakes I made in the past, I designed the aquarium layout as shown on the next page.

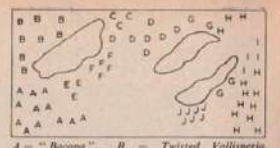
The rockwork was made by me from red coloured concrete, well seasoned and placed so that there was a channel between the two smaller rocks. The compost consisted of ordinary aquarium gravel, with a top layer of very fine sand and a sprinkling of fine red gravel blending the rocks with the sand.

The plants, positioned as in the diagram, toned down the effect of the red rocks, thus rectifying the mistake of last year when I had all-red sand and rocks.

Selection of Fishes

Fish again were chosen to tone down the reddish tone and they consisted of six *Hemigrammus rhodostomus* (Red-nosed Tetras) and six *Hyphessobrycon rubrostigma* (Bleeding Heart or Ruby Spot Tetras)

I then found that some other fish were needed to give more movement and, on introducing six *Brachydanio rerio* (Zebra Fish), the design sprang to life.—F. H. WATTS.



A = "*Bacopa*". *B* = *Twisted Vallisneria*. *C* = *Water Wisteria*. *D* = Cryptocoryne haerteliana. *E* = *Dwarf Sagittaria*. *F* = C. willisii. *G* = Najas. *H* = Ludwigia. *I* = Cryptocoryne cordata. *J* = C. beckettii.

First in the Inter-club Tropical Furnished Aquaria

Ray Skipper photograph

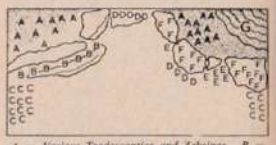
THE two rock formations in this unusual set-up, though appearing quite casual, were the result of a great deal of thought and a number of experiments. They consisted of 15 pieces of red-grey rock sent to me by an aquarist friend in Dundee, who, I believe, collected the rock near the River Tay.

They were cemented together to form two half hollow corner pieces which were filled with aquarium compost, and then planted with *Tradescantia* and *Zebrina* of various types. On the right side there was planted a Royal Fern (*Osmunda regalis*) and, on the left, a small fern-type plant (resembling parsley), of which the name was unknown.

The front of the rocks at the water line was planted with tropical Willow Moss (*Fontinalis gracilis*). All these plants I have found to be good bog plants, but I have never kept them long when totally immersed.

The left foreground was thickly planted with small green Cryptocorynes in a trough formed by a long smooth rock. On the left and right front corners, medium-sized Cryptocorynes were placed in small thickets. Between the two rock formations there was a clump of *Acorus*, some of which was well out of the water, a situation in which this plant thrives. In the rock crevices there were plantings of *Najas*.

The gravel was a mixture of red-black grey shale. To complete the tank, Neon Tetras and *Pristella riddlei* (and I only wish they had been of better quality) were introduced.—A. F. BALDOCK.



A = *Various Tradescantias and Zebrinas*. *B* = *Small green Cryptocorynes*. *C* = *Cryptocorynes*. *D* = Acorus. *E* = Najas. *F* = Fontinalis gracilis. *G* = *Royal Fern* (Osmunda regalis).

Interesting Dwarf Cichlids

Pelmatochromis kribensis pair; *male is to the right.*

Their care, maintenance and breeding habits explained by H. C. PARSONS

NEXT to Angel Fish, the Dwarf Cichlids have always been among my main aquarium favourites. Their brilliant colours and active manner more than repay the little extra care they require to maintain them in first-class condition.

In the notes below I shall attempt to describe the characteristics and breeding habits of four of the most popular of these fish which consist of three Apistogrammas (*A. ramirezi*, *A. agassizi* and *A. ornatipinnis*) and that beautiful African species, *Pelmatochromis kribensis*.

Ramirezis are probably the best known and most popular of the Dwarf Cichlids. When in good condition their variety of colour is amazing.

Much has been written about their care and breeding habits, so I would just emphasize a few points. They should be kept in clear, soft water at a temperature of about 80 deg.F., and approximately neutral *p*H. They like planted tanks, and I have never known these fishes to uproot plants.

I always place a bridge of slate for them to spawn under, but occasionally they prefer a good stout leaf, such as that of a *Cryptocoryne*.

I remove their eggs after they have been laid and put them in similar water to that in the breeding tank but with 4 drops of 5 per cent methylene blue solution per gall. Aeration is provided adjacent to the eggs which hatch in about 2½ days at 80 deg.F. First food for the fry consists of newly-hatched Brine Shrimps.

A male Apistogramma agassizi, *one of the loveliest Dwarf Cichlids. Photographs, G. J. M. Timmerman.*

The male *Apistogramma agassizi* is a most beautiful fish. Its shapely finnage and beautiful colours should ensure popularity. By comparison the females are rather drab being yellowish in general colour and considerably smaller. The male attains a length of 2¼ to 2½ in., which is larger than Ramirezis, and it is correspondingly more boisterous.

I breed the species under the same conditions as for Ramirezis, although my breeding stock has a preference for spawning on the glass of the aquarium, rather than on one of the slate bridges or the half section of a flower pot I provide.

This is a trifle awkward and necessitates removal of the parents to another tank. Otherwise they receive the same treatment as the Ramirezis. The hatching time is 2½ days, the first food is Brine Shrimps.

New Dwarf Cichlids

Apistogramma ornatipinnis is a relative newcomer to our aquariums; a good male will be 3 in. long and a female up to 2 in. Both sexes have a yellowish brown background colour, but the male is far more richly coloured with iridescent blues and greens in its body and fins.

I keep a dozen adults of this species together in a large tank where a fair amount of jostling goes on. Damage, however, appears to be confined to torn fins. The fish do a lot of digging when in breeding condition and plants suffer somewhat.

My fish always spawn under the slate bridges provided and I remove the eggs and give them the methylene blue treatment as previously described. One peculiarity arises with the young fish. They form and commence to wriggle in quite a normal way and after about eight days, when appearing similar to any other baby Cichlid of like age, they fall from their anchorage to the tank bottom. Here they continue to wriggle for a further seven days before becoming free-swimming.

This makes a total of 15 days before the fish take nourishment which is a very long time

compared with the other Dwarf Cichlids mentioned. If an attempt is made to feed after eight days from hatching, the food must be given very sparingly. They are fed on Brine Shrimp and are, I think, the most prolific spawners of the four species I am covering.

Top Favourite

Whilst I admit that Ramirezis are real little gems and that the male Agassizi has unsurpassed refinement, it is my view that *Pelmatochromis kribensis* is the most beautiful of all.

A well-grown male should be 3 in. long and the female, 2½ in. They are both lovely fish, the males being blue green with a delicate pink underbelly and a gorgeous shapely tail with up to seven ringed blue spots. The female sports an even rosier underparts and a brilliant gold-leaf line along the top of her dorsal fin.

Lively Fishes

They are happy, playful fish, making good community stock. *P. kribensis* like high temperatures in the eighties, and they live about two years.

I have had most success in breeding them by using slightly acid, soft water, with a layer of silver sand on the tank bottom. When digging prior to spawning they will uproot plants, but otherwise they appear to prefer a planted tank.

Half-section flower pots are my choice for the fish to spawn in. They should be pushed right down to the aquarium floor as this species will go to more trouble than most to hide its eggs.

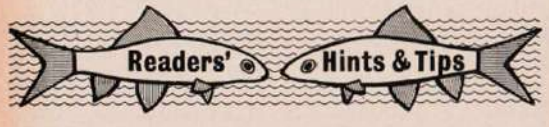
I always remove the pot with the eggs attached and treat with methylene blue and aeration. The fry hatch in 3-4 days and Brine Shrimp is the first food taken. The addition of fresh rainwater induces spawning with this species.

All these Dwarf Cichlids are easy to keep if the basic principles of fishkeeping are adhered to, but water temperature should generally be on the high side—from 78 to 84 deg.F. They will take any livefoods including *Daphnia*, White Worms, chopped Earthworms, chopped *Tubifex* (I always chop *Tubifex*), etc.

Community Breeding

I treat all my Dwarf Cichlids as community breeders, keeping three or more pairs in a 24 × 12 in. or larger tank, heavily planted with *Echinodorus rangeri*, Amazon Swords, or Cryptocorynes. It seems to me that more zeal is inspired in the fishes this way. There is nothing like rivalry to bring out the best in them.

I always keep the tanks with fry or young fish in them well aerated and, after Brine Shrimp, the foods are Dwarf White (Grindal) Worms and *Daphnia*, progressing to chopped *Tubifex* and, eventually, White Worms and chopped Earthworms.

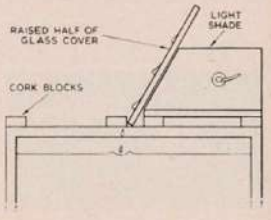


COVER GLASS ARRANGEMENT

THE cover glass for the aquarium is cut in two pieces lengthways. It is raised on small squares of thin cork cut from table mats. These are glued in the positions shown and can be painted if desired, although paint tends to make them hard.

At feeding time the front glass only is raised and it rests behind its cork blocks leaning on the top light shade.

The condensation on the underside of the glass then runs into the tank causing no drips to fall outside the aquarium.—(J. H. SPARKES, Paignton, Devon).



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MALAYAN SAND SNAILS

(Melanoides tuberculata O. F. Muller)

Useful Occupants of the Tropical Aquarium

by T. PAIN & J. A. WILLSON

The small M. tuberculata *shell* (¾ in.) *is from the authors' tanks, whilst the larger one* (1½ *in.*) *is from Palestine. This species' shells have* 10-15 *whorls.*

ALTHOUGH *Melanoides tuberculata** is commonly called the "Malayan" Sand or Burrowing Snail, it is found widely distributed throughout the old world tropics, being known in North and East Africa, Asia Minor, Iran, India, Burma, Southern China, the Malay Peninsula, Malay Archipelago, North Australia and various Pacific Islands.

It is generally found in fresh water, but occasionally in brackish water. *Melanoides tuberculata* does not even avoid hot springs with a temperature of 95 deg.F. or those having a high iodine content. It prefers slow running water, but can live in a stagnant, even polluted, medium. In Java it has been found living at an elevation of 2,000 ft.

It is of interest to note that fossil shells of this species have been taken in the Balearic Islands and Sicily, where *Melanoides tuberculata* no longer lives.

Food of the Malayan Sand Snail consists of green algae and organic waste matter. Carrion, e.g. dead fish, attracts *Melanoides tuberculata* from all corners of the aquarium. When very hungry they even attack live *Tubifex*.

Propagation is extremely rapid in a tropical tank. The offspring from 10 individuals amounting to about 1,500 snails in just over a year. They are not, as is popularly supposed, viviparous, their eggs being retained within the shell until they hatch. They are, therefore, referred to as ovoviviparous.

The young, newly-hatched snails spend the night within a pouch at the neck of the female. From a small 1 in. long, collected in Java, 15 embryos (length between 1/50 in. and 4/25 in.) were obtained. The very young shells differ somewhat in appearance from the adult, being strongly ribbed. This ribbing becomes much reduced and sometimes almost non-existent in adults.

The time taken to reach maturity is not known, the ultimate size attained by the animal depending upon available food supply, volume of water, etc. Shells of the adult snails in aquaria seldom exceed 1 in. in length but in a natural state up to 1¾ in. has been recorded.

Like our common winkle, *Melanoides tuberculata* closes the aperture of its shell with a calcareous plate called an operculum. This enables the snail to trap a small quantity of moisture within the shell and prevents dessi-

A distinct form of M. tuberculata (1¼ *in. long*) *from Iraq. Photographs by J. A. Willson.*

*This is the same species as is often called *Thiara tuberculata* in aquarium literature but the authors are convinced that *Melanoides tuberculata* is the more correct designation. Eds.

cation in the event of the temporary drying up of its habitat during periods of drought.

Variations in Different Localities

The very extensive distribution of *Melanoides tuberculata* in the old world tropics has resulted in the development of local races which have become isolated from the parent stock and have, in the course of development, acquired distinctive features. Many of these races have, in consequence, been described by conchologists as "species", "sub-species", "varieties", etc., but, on critical examination, they cannot stand as distinct forms, since in a large series from many localities they will be found to grade into each other.

In consequence of this, however, the literature on this species would fill folios, and the list of names (synonyms) it has received since O. F. Muller first described it in 1874 is a very considerable one.

Malayan Sand Snails are very useful to have in the tropical tank. They keep the compost scrupulously clean by turning it over when they burrow, and eating any algae which may have formed. Should a fish die and drop behind a rock, or into a clump of plants escaping the notice of the aquarist, these snails will consume it before it rots and pollutes the water. They do not damage the plants, or their roots, and they are unobtrusive. Indeed, they are seldom

The shell of this M. tuberculata (1¼ *in.*) *is deformed which may have been due to an accident when young.*

seen during the hours of daylight, or while the tank lights are on.

If the lights are switched on after the tank has been quite dark for a few hours *Melanoides tuberculata* will be seen all over the tank sides and plants, eating algae. They will quickly drop on the compost to bury themselves and escape the light.

There is one disadvantage associated with these snails; by their burrowing they tend to level out any ornamental "humps" or "hillocks" in the gravel unless this planting medium is held in position by rocks. Their many advantages make this fault a negligible one, and they are to be recommended for the tropical aquarium.

Should they become too numerous their numbers can be reduced by switching on the light, as described earlier, and taking out adult snails before they have time to bury themselves. Do not dig in the compost for them or sediment will be stirred up and it may be several days before the water clears.

Like all snails, *Melanoides tuberculata* should be kept out of fish breeding tanks since they might eat the eggs or young fry.

Self-Fertilization in Guppies

MANY readers will remember that way back in 1953 Dr. Spurway reported in *Nature* that female Guppies in her possession had given birth to young without being fertilized by a male. At the time it was thought to be an example of parthenogenesis (reproduction without sexual union—which in some animals is the normal method of reproduction). There were also a number of sceptics who stated that when keeping Guppies it was easy to overlook a male in a tank which would then fertilize the virgin female and apparent parthenogenesis would result.

In her latest paper* Dr. Spurway gives interesting details of families of Guppies which include 18 females that gave birth to young without the presence of a male. As all the fish were placed in individual vessels soon after birth there was no possibility of normal fertilization having taken place with the 18 fish.

Sections of the unusual females revealed that testicular tissue and sperms were present as well as normal ovaries and eggs. The fish were, therefore, hermaphrodites and the young had apparently been produced as the result of self-fertilization.

Another interesting fact recorded by Dr. Spurway is that unfertilized eggs may sometimes be extruded and not re-absorbed. In six cases these eggs were extruded together with live young but in most cases there were no fertile eggs with the infertile ones.

It would be interesting to learn whether Dr. Spurway's Guppies are very unusual or if hermaphroditism is more common than we realise. Unfortunately the methods adopted by most aquarists when breeding Guppies are unsatisfactory for a scientific study of such a problem.—R. J. AFFLECK, M.Sc.

* Dr. H. SPURWAY, *Nature* (December 7, 1957). Vol. 180. No. 4597, pp. 1248—1251.

Flowering bog Primulas form the main feature in this pondside planting.

MOISTURE-LOVING PRIMULAS

They bring brilliant colour to the pondside

by H. G. WITHAM FOGG

IT is hardly surprising, in view of the large number of Primula species, varieties and hybrids now in cultivation, that the Primula Family should be so well known. Even in the tiniest garden, where growing conditions are far from congenial, one can usually find a plant or two of the common Primrose, often existing in the most precarious situations.

The colourful primroses, polyanthus, cowslips and auriculas are other well-known members of this versatile Family and they are often found growing quite happily where there is little soil or moisture. Generally speaking, however, there must be an abundance of water available if the plants are to do really well.

Many species are most attractive in their manner of growth and in the colour of the flowers they produce, but none more so than the group usually known as the bog Primulas. These like a rich site, where the soil remains really moist without becoming sodden, especially during the Winter.

Where the soil is poor, it is a good plan, since these primulas are gross feeders, to add manure and rich compost, in order to satisfy all the necessary feeding requirements. Even when the plants are well established, an occasional top dressing of good, rotted manure and leaf mould will not only prevent the soil from drying out at any time, but will improve the quality of plant growth and the size of the blooms.

Primulas do object to sourness, so that, where there is any possibility of this occurring, it is wise, before putting in the plants, to take out the soil to a depth approaching 2 ft. and put in a layer of stones or something similar, to ensure porosity. The hole is then filled up with good soil and rotted manure. It is only necessary to add lime where it is not naturally found in the soil.

In preparing the positions for planting, it should be borne in mind that a much better effect can be obtained by placing each type of Primula in a separate group consisting of not less than three plants. Each group should be of a different height, providing a show which will increase the effect of those alongside it. Odd plants dotted here and there never produce a good show and look "bitty".

A very large number of different species have originated from the Continent of Asia and, for convenience, are usually referred to as Asiatic Primulas. It is obvious that, since such primulas originate in the mountainous regions of the Himalayas where there is so much moisture, they come under the heading of bog primulas. Another feature of some of the species is their cylindrical tap roots which, in some cases, go down 10 or 12 in. before

Primula florindæ *in blossom. This species bears large heads of yellow blossoms on 2½-ft. stems and is easily propagated from seed sown in boxes.*

they divide or make the mass of root hairs which all primulas have.

There appears to be renewed interest in primulas of all types and, although we cannot cultivate a large number of species in all the groups, provided suitable soil is available, it will be well worth while growing a selection of the Asiatic species. One has only to think of the interest shown in these by the public at the annual Chelsea Show and other big exhibitions, to realise that bog primulas are indeed popular.

Most of us, for space considerations alone, will have to restrict our range, but there are a number of Primulas which should be included, both because they are well known and because they present no difficulties in cultivation and propagation. Most of them can be increased by careful division of mature plants whilst, in many cases, they are easy to raise from seeds. Since the seed is small, shallow sowings must be practised.

Many of the Asiatic primulas belong to the Candelabra section, in which the plants produce flowers arranged in whorls at regular intervals up the stem. In some cases the flowers reach a height of 2½-3 ft.

With Heart-Shaped Leaves

Primula florindæ is undoubtedly one of the finest of all bog species, having attractive, heart-shaped leaves. During June and July, it produces really large heads of nodding, sulphur-yellow, fragrant flowers on 2½ ft. stems. Ideally, the plants should be placed so that the crowns are 2-3 in. above the water line, the roots actually being in the water. In such a place, *Primula florindæ* will thrive in full sun but, where growing in just a moist or damp place, some shade should be given.

This species is easy to raise from seed which, if sown in boxes in March, will normally germinate very freely. The seedlings should be pricked out into an open bed and subsequently moved to their flowering positions in early October.

Perfumed Primula

Another scented, waterside primula is Anisodora which, from June onwards has attractive wine-coloured flowers on 2 ft. stems. Although these are rather too dull looking for some people, they are actually most excellent as a foil to the brighter subjects.

Primula pulverulenta is another delightful plant, which produces whorls of deep rose flowers, each having a dark centre. Its 2½ ft. stems are powdered with white, giving them a lovely silvery appearance. From this species there has been developed a range of really beautiful pink, red and apricot forms, which grow 18-24 inches high and are generally offered as *P. pulverulenta*, Bartlet Strain. Red Hugh is a fine Candelabra hybrid, having

Postford White variety of Primula japonica. *There are considerable differences between the* P. japonica *varieties. Photographs by L. E. Perkins.*

large flame-red flowers of good form. All of these require the same upbringing as *P. florindæ*.

Primula sikkimensis is an excellent waterside species. The clusters of fragrant, soft yellow, nodding bells are carried on 2ft. stems during June and July and a group of plants, seen in flower, is an impressive sight. *P. secundiflora* has pendant bells which, in this case, are of a violet colour, and its foliage is evergreen.

Another Candelabra Species

Few primulas have gained wider popularity among a large number of gardeners than *P. japonica*, which is one of the best of the Candelabra type, growing about 2 ft. high. It was first introduced to this country from Japan nearly 90 years ago.

It is doubtful whether we now ever see the original *P. japonica*, for it has interbred with other bog primulas, which has resulted in many colour breaks. Some of these plants have been propagated and distributed under distinct names, so that, today, there are available many different plants, all of which may be described and grouped under the name of *P. japonica*, but which differ, to a greater or lesser extent, from the wild species.

It is not possible to refer to all of these named forms, but among the best are Postford White, with a pink eye, which is particularly fine and Brockhurst Crimson, which is bright red. Miller's Seedling is another fine Japonica. When seen in a mixture of colours, the Japonica hybrids present a really arresting sight.

An ideal situation for these Candelabras is one which is moist, but where there is shade, if possible from 12 noon until 2 p.m. The flowers appear from May and often go on until mid-July. Although particularly happy on the edge of a pool or in the bog garden, they will also do quite well in a shady, moist border.

Yet another really beautiful waterside and bog Primula is *P. beesiana* which, from May to June, produces whorls or tiers of fragrant, rosy-carmine flowers on 2ft. stems. It seeds freely and it is often possible to find strong seedlings around established plants. These seedlings will, however, produce flowers in varying shades of pink.

Slightly shorter growing is *P. bulleyana* from China. This carries its buff-orange flowers with great freedom and is another species from which it is often possible to secure attractive hybrids.

Of quite different appearance, *P. denticulata*, has stems 12-18 inches high, which are surmounted by clusters or heads of attractive lilac flowers. The form known as Cashmiriana has purplish-mauve flowers, while there is also a white type. All of these are quite happy growing in the herbaceous border as well as in moist positions.

P. helodoxa will, on occasions, produce stems 2½-3ft. high which carry several whorls of rich yellow flowers. *P. veitchii* has globular heads of rosy-pink blossom on 1ft. stems, while *P. waltonii* is a very free flowering species with well formed, ruby-red blooms on 18-in. stems.

These primulas provide colour and variety and never fail to create interest.

Fishes and Reptiles in Recent Imports

by P. MILLET

OWING to an almost universal human failing most people tend to value things more that have been brought from distant parts of the world, and to neglect equally interesting subjects that can be found nearer at hand.

This same attitude seems to exist where fishes are concerned. Aquarists are always on the lookout for "new" fishes from Siam, Brazil and darkest Africa, though few of them have ever even seen so-called tropicals that live in Europe itself and in the Asiatic and African countries bordering the Mediterranean.

Three such species come to mind and fishkeepers holiday-making in Southern Europe might be able to collect them and bring them home for their tropical tanks. These fish are *Valencia hispanica* which, as its name implies,

comes from Spain, and two species of *Aphanius*—*A. iberus*, also from Spain, and *A. fasciatus*, which can be found in a number of countries and islands around the South of Europe including Italy, Sardinia and Cyprus.

The last-named fish has been imported recently and is currently on offer. It is an attractive species in which the males are bright blue when in condition, and the females a paler greenish blue. Both sexes have several vertical darker bars, but these are more noticeable in the females.

Pair of Pterolebias longipinnis. *Male is the upper fish and has fuller finnage. Photograph, Gunter Senff.*

A. fasciatus can be bred in a tank which contains a good supply of bushy spawning plants and in water at a temperature of around 78 deg.F. The fry are quite large when hatched as the yolk sac is absorbed by the embryo fish before they hatch. Consequently the newly-hatched fry should be supplied with such food as screened *Daphnia* right from the beginning.

The parent fish, which may reach a length of 2½ in., must be removed as soon as the spawning is completed.

Should these fish not appear happy the addition of a teaspoonful of sea-salt to each gallon of water will probably improve their condition as, if specimens are not aquarium bred, it is possible that they were collected from brackish water in which this species is frequently found.

Two very rarely seen African *Nothobranchius* species have also arrived in a recent import. *N. guentheri* from East Africa is a very handsome fish. The males show a predominance of blue with red spots and the female is greenish. The tail and anal fins of the male are highly coloured, while those of the female are clear and colourless.

The fish may reach a length of 3 in., and it is possible to breed them in the same way as the Aphyosemions. *N. palmquistii* is the other species on offer. It is also a living jewel being very highly coloured. To date no information regarding its breeding has come to my knowledge.

Fishes that normally go through their life cycle from hatching to death in the course of one year are, to use an expression borrowed from gardeners, "annuals". The Argentine Pearl Fish (*Cynolebias bellottii*) is, perhaps, the best known of these, though many other aquarium fishes, including our own Three-spined Stickleback, usually behave in a similar manner when in the wild condition.

One of these fishes not often seen, is *Pterolebias longipinnis*, the male of which is spectacular to a degree having very highly developed finnage compared with the female. These fish can be spawned by the experienced aquarist. They must have old acid water, and a bottom layer of peat in which the female buries the eggs.

More Glass Angels

The Glass Angel *Gymnochanda filamentosus* (first referred to in the November issue) is now being imported in larger quantities and shows considerable hardiness compared with some of its relatives. Although the fish is reaching this country via Singapore, it appears that its natural habitat is Java. This species has been known to a few lucky aquarists in the U.S.A. for some time now, but regular imports should make it an established favourite in this country, for it has many features that place it apart from the usual run of aquarium fish.

Herpetologists will be interested in a consignment of Australian reptiles received recently by a well-known importer in the North-west. These have come from the desert 500 miles north-west of Alice Springs and comprise a selection of rare lizards some of which appear to be unknown varieties, if not species.

There are colour varieties of Gould's Monitor (*Varanus gouldi*), and specimens of very rare Spiny-tailed Monitors (*V. acanthurus*) which are probably the only specimens of their kind alive in Europe today.

Monitors are a successful group of large lizards that have managed to spread over three Continents, and include the world's largest living lizard, the Komodo Dragon. Many of the species do well in vivariums.

Also represented are some of the Skinks of the Genus *Tiliqua* including a rare Blue-tongued Skink, *T. occipitalis*, and a large specimen of *T. nigrolutea*. While some of the rarer lizards in this collection are already sold to the Royal Zoological Society of Scotland, no doubt others will reach the vivariums of fortunate amateur reptile enthusiasts.

FROGS AND TOADS

by JOHN CLEGG, F.R.M.S.

Illustrations by the author

The Common Frog, which has a smooth skin.

It will be appropriate in this article to break into our monthly discussions of the smaller pests that trouble fishes, with a seasonal warning of much larger enemies, viz., frogs and toads. These, of course, concern only the pondkeeper.

There are now in Britain three species of frog : The Common Frog, familiar to everyone but much less abundant than formerly ; the Edible Frog, a Continental species which has been naturalized in a few areas and persists in various parts of Surrey, West Kent and possibly Bedfordshire ; and the large, closely-related Marsh Frog, another Continental species, which from a few individuals introduced into a garden in Stone-in-Oxney in 1935 has increased in a spectacular manner in the Romney and Walland Marsh areas of Kent and Sussex.

Early Breeding

It is, however, the Common Frog which is likely to cause most trouble. It mates early in the year, sometimes, indeed, in the West Country as early as January, but in other parts from about the middle of February. Great numbers of both sexes congregate in the shallower margins of ponds, the males usually arriving first. They soon pair up, the males grasping the females in a tight embrace until the latter lay their mass of eggs, the males emitting their sperm as the spawn is ejected.

The mating instinct is exceptionally strong in frogs and unmated males frequently grasp any moving object within reach. Thus it is that in a garden pond fish may be seized and either seriously damaged or even killed.

Sometimes fish which have been attacked by frogs show extensive bruising on both sides of the body where the front legs of the frog have grasped them but, in other cases, the fish are killed quite quickly and without much superficial damage by being drowned in their own element, the frog having grasped the fish so that its gills were closed thus preventing it from breathing. Moreover, such attacks take place at a time of the year when fish are naturally in a somewhat poor condition.

Different Site Chosen

Toads spawn about a month later than frogs and, in general, they choose deeper water than do frogs. All the individuals from a wide area converge from their hibernation quarters to selected ponds and often other apparently suitable stretches of water on the way are passed by.

Toads seem to choose routes which have been used by generations of their kind and, if these have now been crossed by new roads,

A Common Toad, showing its warty and dull skin.

many toads meet their deaths by being run over when traversing the traditional paths.

This selectivity of toads for particular spawning sites means that there is less likelihood of these amphibians causing trouble in a new artificial pond than with frogs which are not so fussy in their choice of breeding places.

As with frogs, the male grasps the female in a tight nuptial embrace and, in the absence of females, will similarly seize fish or other passing objects.

The only practicable steps that can be taken to avoid damage by frogs and toads is, if the pond be small enough, to erect a temporary low fence of wire-netting or other material in the Spring. Otherwise a watch must be kept on the pond and any frogs or toads seen or heard netted—not by any means an easy task.

There is an additional reason for keeping toads out of garden ponds. Their tadpoles are said to be poisonous to some fish. This does not apply, however, to frog tadpoles which are relished as a welcome change of diet. The large, shapeless masses of frog spawn are well known. Less familiar is that of toads, which is deposited in thin strings, often many feet in length and usually wound in and out of water plants.

The distinctive features of frogs and toads can be seen in the illustrations. Frogs have a smooth and moist skin whereas that of toads is warty and duller in appearance. Frogs progress in a series of hops but toads, if not alarmed, crawl, their shorter legs not being such efficient propelling organs as those of frogs.

by DR. F. N. GHADIALLY

TO the aquarist, "nature" and "natural" are important words, for one can hardly discuss any piscine topic without some nature enthusiast reminds us that what we have done or intend to do is unnatural. The word "natural", of course, means very different things to different people.

When we talk of fish in their natural surroundings, we really mean fish in the wild state, in the rivers, ponds and the sea. Does it therefore follow that fish kept in aquaria are in unnatural surroundings ? Most of the fishes that we keep in our tanks have been aquarium-bred for scores, even hundreds, of generations. Surely to them the aquarium is their normal and "natural" habitat. If they were transported to rivers and ponds, that would be a very unnatural surrounding indeed for them.

The idea that this mysterious "natural" state is the ideal and that, as aquarists, it is our job to imitate nature, is, in my opinion, highly overrated. Learning from nature is, of course, a different matter. I like to know how fishes live and breed in the wild state. I like to know the temperature and the chemistry of the water they live in, but I have no intention of slavishly imitating these conditions in my tanks, because I do not think that would lead to success.

The problems facing me and nature are very different. I want to keep 50-odd fish in a small aquarium—in nature that quantity of water, on average, would house rather less than one fish. In nature, probably one or two fishes survive to maturity from a spawning, the rest are eaten up or destroyed by disease or starvation. I would like to do a lot better than that, I want to rear a few hundred fish from a spawning. I want to see them healthy and well-fed.

The problems are different, and hence the method of solution must be different, mere imitation is bound to fail. All the ingenuity of man must step in with his heaters, thermostats, pumps, filters, dried foods, cultured foods and what have you, to achieve this end.

A non-discerning admiration of nature is as detrimental to successful fishkeeping as would be the refusal to learn from observations made in nature.

Temperature Variation

We all know that most tropicals experience considerable fluctuations of temperature during the course of the day and that the surface layers of water in stagnant ponds are bound to be appreciably warmer than the water at the bottom of the pool. Based on these natural observations, some might advocate that these conditions should be mimicked in the aquarium. There are, in fact, some aquarists who believe that such fluctuations improve the health and vitality of fishes.

There is, however, no concrete reason to believe this to be so ; indeed, hundreds of aquarists maintain a more or less uniform temperature of about 78 deg.F. in their tanks and the fish are none the worse for it.

I fail to see why because a thing is natural it should also be the best for the creature concerned. The fish probably enjoy and benefit from variations in temperature just about as much as we enjoy fogs and blizzards but they live through them just as we do ; they have little choice in the matter. If an aquarist gives them perennial warmth and light wherein lies the objection ?

Some years ago, in order to utilize the heat that is normally lost from the electric lamps used to illuminate my aquaria, I fixed them so that the glass portion of the lamps was immersed in water. At first, I only burnt the lamps a few hours a day but as time went on I forgot to switch them off and in the end I left the lamps on more or less indefinitely day and night. In fact this went on for about two years, when I decided to end the experiment and try out a different lighting system.

No doubt, all this was entirely unnatural and according to some it might have a detrimental effect on the fishes and the plants and cause algae to smother everything.

However, these things just did not happen. Algae trouble was encountered but once the plants got really going algae disappeared from the tanks and only formed on the lamps. The fish and fry did very well indeed. I bred large numbers of livebearers and egglayers as well as ever before and the plants grew in abundance. In fact, with plants grown under such unnatural conditions (virtually no daylight reached the tanks which were housed in a cellar) I took many first prizes at shows and won the cup at the Manchester British Aquarists' Festival in 1952.

A well developed male Siamese Fighting Fish, a tropical species with which aquarists have effected great improvements by line breeding. Note the flowing finnage. Photograph, G. J. M. Timmerman.

At the moment I am busy returning to these "unnatural" conditions. In my new fishhouse the tanks have just been fitted with submersed lights which system has now been tried by many aquarists with success. So far nobody has reported any ill-effects to fish or plants. Thus we see that even a considerable deviation from natural conditions, like giving the fishes continuous light for a prolonged period, produces no detrimental result.

Most animals, including fishes, caught in the wild harbour a few or many parasites and suffer from one or more diseases. This is but natural for nature has to look after the welfare of both the pests and the fishes ! The aquarist, with only unilateral obligations, however, is not satisfied with this state of affairs so, with drugs, he kills off the parasites and cures the fish.

Quality of Wild Fishes

A few years ago I saw some Angels and Tiger Barbs that had been caught in the wild ; their colour was poor and the fins were tattered and scarred. The Tiger Barbs looked very thin and flat in the belly. This was exactly the condition they were in when caught from their natural waters and they would certainly have won no prizes at a show.

In the wild state there is fierce competition for available food, in fact the size of an animal colony is dependent upon the total available food. Starvation is the cruel, ruthless whip by which nature controls the numbers in an animal colony. Imagine what would happen if every fish in every spawning found food to grow up on and reach maturity ; the waters would be solid with fish.

Life is a constant struggle with the proverbial survival of the fittest, the not so fit and the small serving as food for the larger fishes. There is little doubt that the average expectancy of life for a fish in the wild must be much less than that in an aquarium maintained by a competent aquarist. The fact that some fishes in the wild grow to a larger size than aquarium-kept specimens does not militate against the concepts expressed here.

Sometimes nature can do better than we can, on other occasions we can improve on her work. The large numbers of colourful fishes, Fighters and livebearers in particular, bear silent but certain testimony to this fact. None but a fanatic would insist that the beautiful Veiltail Guppies and the colourful Fighters are not more attractive fishes than the wild specimens seen in nature.

The admiration of the unquestionable beauties of nature should not be accompanied by belittling the achievements of man. There is much we can learn from nature but we have a few tricks up our sleeves also !

BREEDING TROPICAL EGGLAYERS

by D. B. McINERNY

Methods to adopt for the first spawning attempt

I AM assuming that those who are following these articles will now have some good cultures of Infusoria and Mikro-worms, as recommended in the last issue, and are confident about keeping such cultures going steadily.

You may also have obtained an adult pair of Black-line Tetras (*Hyphessobrycon scholzei*) or the other species mentioned in my January article. The male and female will have been kept in separate tanks and well fed. Provided the female is very plump the first spawning attempt may be made but, if there is any doubt about her being really full of roe, it would be better to wait a little longer before proceeding. A failure is not only disappointing but could result in damage to the female and this would only set back everything for a week or two.

Assuming all is well we can now set up a breeding tank and one of 24 × 8 × 8 in. dimensions is ideal. It should be placed near a window where it will receive good light. Into it is put a 1 in. layer of well-washed 1/16 in. grade sharp sand.

Water is added, three gallons being sufficient to give a depth of 4 to 5 in. which is approximately 1¼ enamel bucketsful. If the water is poured into a 2 lb. jam jar standing on a square of glass in the tank, there will be a little or no disturbance of the sand.

Usually the quality of the water is a most important factor, but with easy fishes like Black-line Tetras, Black Widows, Beacon Fish, Pristellas, Salmon Discus or Glass Characins, the range of tolerance is wide enough to cover most tap water in this country, the average mains water being slightly alkaline and moderately hard. Even so a small amount of clean rain water, say one gallon, may be added. This not only reduces the *pH* and hardness but the change stimulates the fish.

Pristella riddlei, *sometimes called X-ray Tetras.*

Planting the Aquarium

Planting the tank correctly also helps. I have found that a satisfactory layout for most species is to line the back and sides of the aquarium with a row of Twisted Vallisneria (*V. spiralis* var. *torta*) or *Sagittaria natans*, spaced about 1½ in. apart.

Approximately 5 in. from each end of the tank a good bunch of *Limnophila* (*Ambulia*), *Cabomba* or *Myriophyllum* should be placed, consisting of about 10 stalks per bunch, and these should be tall enough to reach within 1 in. of the surface of the water.

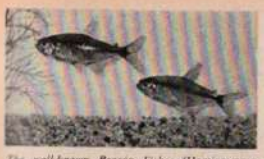
The rest of the tank is dotted here and there with short plants such as young Indian Ferns, Dwarf Sagittarias or small Cryptocorynes. This arrangement allows plenty of space for chasing and spawning.

Now set the temperature to 78 or 80 deg.F., a little warmer than the water in which the parent fish have been conditioned. Place the pair in the breeding tank about one hour before sunset, this gives them time to get accustomed to each other and become used to their new surroundings before darkness.

For those fishkeepers who work away from home a Friday or Saturday evening is the time to choose for the breeding attempt, then the next morning the aquarist is at home and free to watch the pair and remove them if they are incompatible or if they have spawned, after which the hungry fish will eat any eggs they can find.

The aquarist is advised to be about early, as the fish usually spawn an hour or two after dawn when the daylight is strong. Approach the tank slowly, make no violent movement and sit so that you can observe the tank comfortably at eye level.

If, after some time, the fish show no interest in each other, leave them and return half an hour later. Once they are spawning they are



The well-known Beacon Fishes (Hemigrammus ocellifer), *valued for their pleasing colour.*

usually far too engaged to bother about much else, and sometimes even a good thump on the floor will only deter them for a matter of seconds before the chasing is resumed. The male flutters around the female in great excitement, while she, though much more subdued, responds now and then.

Soon she will approach and hover near the tall clumps of plants; the male dashes to her and places himself alongside, pressing his underflank against hers and quite often tilting her over a little. Now both quiver their fins rapidly as the eggs are expelled and fertilised till, with a flip, they break apart.

Watch carefully and 10 to 20 clear eggs will be seen falling through the water. Some get lodged in the fronds of the plants and can be seen shining against the background of light entering the aquarium from the window.

The same act is repeated over and over again until some 100 to 250 eggs are laid. In their frenzy the spawning fish knock the plants and many eggs fall out of sight, but others take their place. After 1-1½ hours the female, having expelled so many eggs, is much slimmer, and her excitement begins to diminish. The male still continues to drive her, but now she tends to keep away from him, hiding under

Small shoal of Black Widows. They can be bred by the method fully described in this article.

low, hanging plant leaves or even cowering in a corner of the tank.

The fishkeeper should then intervene and half-fill two 2-lb. jam jars with the breeding tank water. Take the water gently from the surface. Then, with a soft net, slowly and very quietly drive one fish into it. When it is caught, place it in the jam jar. Catch the other fish and place it in the other jam jar.

Do not hurry over this operation, or many eggs will be knocked and damaged and even, perhaps, buried in the sand if the bottom is too greatly disturbed. The parent fish still in the jars are then floated back in their original tanks, and tipped out only when the temperature of the water has equalised.

Fungus Affecting the Eggs

During the day, some eggs will fungus and turn opaque white; these are probably infertile, but do not worry if there are still clear eggs among the plants. Twenty-four to 30 hours after spawning the eggs hatch and the tiny fry appear. They look like minute splinters of glass and may be seen, here and there, hanging tail downwards from the underside of plant leaves, or on the side panels of the aquarium. Seen against the window their bodies glisten as the light shines through them.

Black-line Tetras (Hyphessobrycon scholzei), *which are easy Characins to spawn. Photographs illustrating this article are by G. J. M. Timmerman.*

In a further 24 hours some babies will be seen swimming jerkily from one plant leaf to another whilst others will still be hanging on by the sticky thread attached to their heads. Now a little Infusoria may be given, say, half a 2-lb. jam jar full, but be sure the temperature of this is not cooler than the water in the breeding tank.

From the following day the fry will need two 2-lb. jam jars of Infusoria daily, one in the morning, the other in the early afternoon. A week later they will take newly-hatched Brine Shrimps and occasional feeds of Mikro-worms. Once past this stage they may be reared on a good, dried food of fine texture.

Cryptocoryne griffithii and its allies

Aquarists can help in sorting out classification difficulties with this popular aquarium plant

by Dr. H. C. D. de WIT

A plant of Cryptocoryne griffithii *Schott.*

FROM 1832-1845 William Griffith, a surgeon, worked in British India. Griffith was born at Ham Common in Surrey in 1810 and was an amateur botanist with a wide knowledge of plants. He amassed large collections of dried plant specimens on his long journeys through Afghanistan and the Malay Peninsula. His important herbarium is now kept at Kew.

After Griffith's death (1845) a large quantity of his highly valuable botanical notes remained unpublished until 1847-1854, when J. McClelland had them printed in four volumes.

As a result, descriptions by Griffith of two species of *Cryptocoryne* appeared in print in 1851; the first was *Cryptocoryne cordata* and the second, for which Griffith had no name in his MS., was indicated as "Cryptocoryne No. 5". This latter species was different, Griffith suggested, in having a very much shorter tube to its flower, the limb was narrower, shorter tailed and warty, not smooth as in *C. cordata*.

Griffith's view was shared by H. W. Schott, a director of the Botanic Garden at Schönbrunn (Austria), and this caused "C. No. 5" to be named *Cryptocoryne griffithii* Schott in 1856. Later authors supported Schott's decision, e.g., H. G. A. Engler, who published a revision of all *Cryptocoryne* species in 1920.

Greater Complexity

In the meantime, however, the problem of the de-limitation of *C. griffithii* and allied species had been made more intricate by the work of H. N. Ridley, a director of the Singapore Botanic Garden.

In 1900, the Botanic Magazine contained a coloured plate of a plant named *C. griffithii*, flowering at Kew. Ridley held that this identification was erroneous and that, actually, a new, undescribed species had been pictured. This led to the publication of *Cryptocoryne purpurea* Ridley in 1902. The characters which Ridley indicated as differences between *C. griffithii* and *C. purpurea* I do not think are convincing, though it must be admitted that he may have been right in distinguishing the two.

A Related Plant Named

In 1905 Ridley proposed still another, closely allied, species, *Cryptocoryne grandis*, as he named it, which occurred in Sarawak, and it is obviously closely allied to *C. cordata*, *C. griffithii* and *C. purpurea*. It is not surprising, therefore, that C. X. Furtado, a botanist working at Singapore, in 1935, reduced *C. grandis* to *C. cordata*.

These are some of the main facts to be considered when assessing the status of *C. griffithii*. Were Griffith, Schott, Engler, and others right when they accepted "Cryptocoryne No. 5" as a well-defined species, or is it preferable to accept one single species only, to be named *Cryptocoryne cordata*, Griff., and are the allied species, mentioned here, nothing but local varieties?

Aquarists may help to answer these questions by growing as many kinds of *C. griffithii* as they are able. When the plants flower the aquarist should carefully note anything that could be of interest and, by preserving flowering specimens either by drying them or placing them in spirit, make them available for later research.

One of the author's Mock-metallic Goldfish, pictured in its aquarium on the Goldfish Society of Great Britain's stand at Olympia where Pseudo-matt and Hammered Metallic fishes were also on view.

Two New Characters in Singletail Goldfish

DAPHNE MORRIS tells of test crosses she made

IN the Summer of 1954 a series of test crosses was made with the new varieties of Singletail Goldfish described in the last issue. The Summer was a poor one and no heating was available. Some of the failures recorded were due, in part, to cold killing the eggs. The results of some counts are too small and are misleading.

The difficulty of distinguishing between Pseudo-matt Goldfish and true Matts will for ever prevent accurate counts being taken. Some Matts are coloured and Pseudo-matts can be colourless or the colouring may fade. Only a test cross can prove the group of any fish having no reflecting tissue but to date no fish assumed to be Pseudo-matt has proved to be a Matt. The test matings are numbered 1-20.

1. In the first test cross a third generation Pseudo-matt male was crossed with a fourth generation Mock-metallic female. No eggs developed.

2. In the second mating a third generation Pseudo-matt male was crossed with a third generation Pseudo-matt female. The eggs did not develop but the temperature fell to 48 deg.F.

3. For the third test mating a first generation Nacreous male was crossed with a fourth generation Mock-metallic female. No eggs developed.

4. In this mating a first generation Nacreous male was crossed with a third generation Mock-metallic female. A few eggs appeared fertile but none hatched. Reference should be made to mating 11 for a repeat spawning from this pair.

Fifth Mating

5. Here two fourth generation Pseudo-matt males were crossed with a Nacreous female of the original generation. Their relationship was distant. Fertility was high but low temperatures caused many eggs to die. Counts at six weeks showed 56 Metallics and 164 Nacreous and Matt fish. In this case the Pseudo-matt males acted as Nacreous and the result was normal for a Nacreous × Nacreous mating.

6. When a first generation Nacreous male was crossed with a Nacreous female of distant relationship 10 Metallics, 4 Mock-metallics and 61 Nacreous and Matt fishes resulted. Although the Nacreous female was thought to be unrelated she was bred from a fish of Mr. C. F. Whitehead's strain. The small percentage of Mock-metallics was thus about the same as the original finding.

7. A first generation Nacreous male, crossed with an unrelated Metallic female, resulted in 242 Metallics and 245 Nacreous fishes. In this case there was no possible relationship.

8. For the eighth mating a fourth generation Pseudo-matt male was used and a fourth generation Pseudo-matt female. No Metallics were produced but there were 10 Mock-metallics, a single Nacreous fish (which could have been a Pseudo-matt), 21 Pseudo-matts and eight Matts.

Fertility was high but the alevins were weak.

The author, Miss D. Morris, talks with other Goldfish Society members at Olympia. L. to r.: Mr. R. E. Ivor, B.Sc., Mr. Owen Taylor (secretary) and Mr. J. Bundell. A photograph of the entire G.S.G.B. display appears on page 199.

The lethal effect of using a fourth generation female was apparent but sufficient fry lived to give a picture of the result of using this mating. The eight fish were pink and the 21, coloured. These latter were assumed to be Pseudo-matts.

9. Here a third generation Pseudo-matt male was crossed with a fourth generation Pseudo-matt female. The alevins hatched in five days. None became free-swimming and at the end of a week all had died.

10. When a fourth generation Mock-metallic pair were mated 154 Mock-metallics and six Pseudo-matts were produced. Note that a Mock-metallic mating in no way resembles a Pseudo-matt mating.

11. For the eleventh mating a first generation Nacreous male was crossed with a third generation Mock-metallic female. There were 26 Metallics produced and 45 Mock-metallics, 10 Nacreous fish, 52 Pseudo-matts, but no Matt fishes. This was a repeat of spawning 4.

12. With a third-generation Pseudo-matt male and an unrelated Metallic female, 48 Nacreous and 57 Metallic fishes were produced.

13. When a fourth-generation Mock-metallic male was crossed with a fourth-generation Pseudo-matt female only a few eggs hatched and just three fish lived. Two were Pseudo-matts and the other was a Mock-metallic.

14. Here a fourth generation Pseudo-matt male was crossed with a Pseudo-matt female of a similar generation. Only a dozen or so fishes hatched and these soon died.

15. The fifteenth mating took place in 1955 between a third generation Nacreous male and a third generation Mock-metallic. It resulted in 56 Metallics, 67 Mock-metallics, and 102 Pseudo-matts and Nacreous fishes. Many alevins were born with crooked spines. Swim bladder trouble took heavy toll. The Nacreous and Pseudo-matt fish were strongly mottled and their colours were bright and clear.

16. In this mating (1956), between fourth generation Pseudo-matt fishes 100 fry hatched but only seven lived. These were five Mock-metallics and two Pseudo-matts or Matts.

17. The remaining four matings took place in 1957, the first being between fourth generation Pseudo-matt fishes when about 500 alevins hatched. Some never became free-swimming and many had crooked spines. Others developed swim-bladder trouble. An accurate count could not be taken but surviving fry were composed of Mock-metallics and Pseudo-matts. Only two of the latter were colourless and may or may not have been true Matts.

18. When an unrelated Metallic male was crossed with a fourth generation Pseudo-matt female approximately 1,400 alevins hatched which were exceptionally strong and there were virtually no deformed fish or signs of swim-bladder weakness. An accurate count was not taken but there were approximately 45 per cent Nacreous fishes and 55 per cent Metallic. The female was the same fish as used in spawning 16.

19. The result of crossing a fifth generation Pseudo-matt male with a fourth generation Nacreous female was 21 Metallics, 46 Mock-metallics, 68 Nacreous fishes and 124 Pseudo-matts and Matts.

20. The final spawning was obtained by Mr. W. L. Wilson and was between a Nacreous male and a Mock-metallic female. A count was not taken but there were approximately 50 per cent Nacreous and 50 per cent Metallic fishes.

Conclusions to be drawn

The results of these spawnings clearly show the difficulties I have encountered in this strain but they have been more than offset by the fish produced, many of which have been outstanding.

The percentage of worth-while fish in each spawning has increased since I began to breed from combinations of the new groups and it seems likely that they hold the key to colours not previously seen in Nacreous and Matt Goldfishes.

The American Bull Frog (R. catesbiana) which grows to about 7 in. It is the species most commonly kept in Britain. Photograph by Robert Bustard.

Keeping Bull Frogs

Giants among this group of amphibians

by ROBERT BUSTARD

EVERY frog and toad collector at some time or other wants to keep Bull Frogs. They are giants among frogs and undoubtedly this is one of the reasons for their popularity. Another reason is the ease with which they can be kept in a vivarium where they feed well and will live for many years.

There are three species which are likely to be available from time to time. These are the Indian Bull Frog (*Rana tigrana*), the American Bull Frog (*Rana catesbiana*), and the African Bull Frog (*Rana adspersa*). They have several requirements in common, namely, that they like roomy vivaria which should be set up like a swamp and which should be heated, at least during the Winter.

The American Bull Frog is the hardiest in this respect as it is widespread in the United States and even occurs as far north as Southern Canada. This species can be hibernated during the Winter, if desired, a course which I do not recommend for the other two species.

Vivaria for these frogs must be roomy, as previously mentioned, and I suggest that an aquarium or other water-tight vivarium is used so that it can be kept humid, like a swamp, without difficulty. Nothing smaller than 24×12×12 in. should be considered, and the container should be larger if possible. I have kept adult pairs of *Rana tigrana* and *Rana catesbiana* in a vivarium of 36×20×20 in. dimensions and found this to be a suitable size for one pair.

If an aquarium is used, part of it can be filled with water and the other end can consist of damp mud with some moss and reeds or other marsh plants. A wall of stones can be built across the centre of the tank to keep most of the earth behind it.

Some herpetologists prefer to sink a large pie dish into the soil and use this as a pool. Such a system makes for much easier cleaning out and it is simpler to regulate the degree of dampness of the surrounding soil. I prefer this method as the pie dish can easily be disguised and quickly removed and cleaned.

If the pie-dish arrangement is not used it means that the whole set-up must be disturbed in order to clean it out. Many collectors will dislike pie dishes or other unnatural objects in their vivaria and they would be well advised to make a small pond of concrete. This is easily done and, if it is treated before use to neutralize the alkalinity of the concrete, it will be perfectly safe. The pool should be of good size—at least large enough for both Bull Frogs to be completely submerged at the same time.

Indian Bull Frog

We can now consider individually the species mentioned above. Comments on the African Bull Frog will be made in the next issue. First let us take the Indian Bull Frog (*Rana tigrana*) which commonly reaches 6 in. in snout-vent measurement and is said to even achieve 7 in. It is common in many parts of Eastern Asia. Above, the coloration is olive brown with darker markings. Below it is white. There is, of course, an intergrading on the sides where the general shade is greenish. This frog has a pointed snout.

Indian Bull Frogs are inclined to be nervous initially but, in suitable surroundings, they will soon settle down. If kept in an aquarium, the sides and the back of it should be covered over with cardboard or painted black as the

frogs will then have a feeling of security which they would never get if surrounded by glass on all sides.

The Indian Bull Frog is mainly aquatic and will spend long periods in the water. When out of water it will dig down into the mud until only its head is in sight and the colour of its back blends so well with the surroundings that it becomes very difficult to see.

The Indian Bull Frog has powerful hind limbs and can jump for very long distances. It has been said that it can jump as fast as a man can run and this is possibly true over short distances. I once had a specimen escape, and the speed with which it traversed the length of a lawn—in several tremendous leaps following immediately after each other so that it hardly appeared to touch the ground—was quite incredible.

These large frogs are quite capable of swallowing a fully-grown mouse—which is true of all the Bull Frogs mentioned. They will also take Common Frogs or large Earthworms and have insatiable appetites.

I have always kept my Indian Bull Frogs heated in the Winter—at a temperature of 65-70 deg.F. Heating is not necessary in the Summer but, if during cold spells they go off their food a little, heat can be supplied.

American Bull Frog

The American Bull Frog (*Rana catesbiana*) has much in common with its Indian relative. Like it, this species is largely aquatic and spends most of its time in the water or within easy reach. There are records of specimens living for years down wells where they were obliged to remain constantly in the water.

They achieve a size of about 7 in. The male has a pair of internal vocal sacs. In *Rana tigrana* these are external. In *Rana catesbiana* the tympanum is very large, the colour above being olive brown with darker markings and spots dark brown or black. Below, it is yellowish white with brown markings, notably on the throat.

R. catesbiana requires exactly the same treatment as *Rana tigrana*, and will eat precisely the same food. In a wild state ducklings are said to be eaten, and small snakes are also often taken. It is relatively hardy and can be hibernated if in good condition, although I prefer to keep my specimens warm during the Winter. Like *Rana tigrana*, it is a wonderful jumper.

Rana catesbiana is undoubtedly the Bull Frog most commonly available in Britain and is very popular as a pet. I think its large size is one reason and the fact that it is hardy. Its popularity is sufficient to recommend it as a very desirable vivarium inmate.

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Fish Philately

★★★★★★★★★★★★★

Pennant Coral-fish

SPECIES in the Family *Chaetodontidæ*, the Butterfly Fish, are mostly small and brilliantly coloured. The teeth are small and bristle-like, the dorsal fin is continuous and scaly and the ventral fins have one spine and five rays. The natural habitat of these fishes is rocky pools, pearl banks, and coral reefs in clear waters.

Apart from *Chaetodon*—the principal Genus—the Family includes *Heniochus*, to which Genus the species illustrated here belongs. It is the Pennant Coral-fish (*Heniochus acuminatus*, syns. *H. macrolepidotus* and *Chaetodon acuminatus*), whose popular name derives from the greatly-elongated fourth dorsal spine and attached membranc. The snout is somewhat elongated into a tube-like form with the jaws at the tip.

This fish, which reaches a length of 10 in., is coloured pearly white, with dark purple vertical bands and bright yellow on the pectoral, dorsal, anal and caudal fins.

The stamp on which the Pennant Coral-fish is depicted is the turquoise blue 1-escudo value from the beautiful series issued in 1951 by the Portuguese colony of Mozambique in East Africa. Each stamp in the set portrays, in natural colours, a different species of sea-fish from the coastal waters of the Indian Ocean.

JOHN WAKEFIELD

★★★★★★★★★★★★★

The cabinet which encloses a 24×12×20 in. tropical aquarium and has cupboard space below.

An Aquarium in a Cabinet

MORE and more fishkeepers are becoming conscious of presenting their decorative aquariums in as attractive a manner as possible. The angle iron frame is generally concealed behind fascia board or with a cabinet.

Mr. J. Bryson, who lives very near FISHKEEPING AND WATER LIFE's office in south-east London, adopted the latter idea. The frame and panelling of the cabinet was made by a joiner to Mr. Bryson's specifications but he polished it himself. The aquarium is 24×12×20 in. high and is put in through the top.

Heating Apparatus

The method of heating is unusual and effective. In a drawer immediately below the tank (which, incidentally, has a toughened glass base) is a sheet of asbestos on which is mounted an electric heating element giving an output of 200 watts. The heater is controlled by an outside adjustable thermostat on the back of the aquarium. Plant growth has much improved since this base heating was employed.

The problem with all deep aquariums had to be faced here; there was a temperature gradient of sometimes 20 deg.F. between the top layer of water (due to the warming influence of the canopy lights) compared with the lower stratas. Fluorescent lighting (20 watts, white) was tried and found efficient. The temperature variation from top to bottom does not now exceed 3 deg. and plants appear to find the fluorescent illumination to their liking.

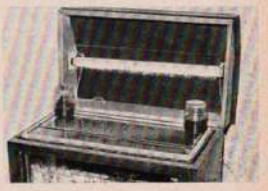
Preventing Rust

To prevent rust forming on the top angle of the iron an extra strip was welded on during construction of the frame and the entire top angle iron of the tank was covered with rubber sheeting stuck down with adhesive. The top glass drops inside this extra iron strip and is provided with a hole for feeding the fish.

It will be seen that Mr. Bryson has the secret of working in a restricted space and jars of Dwarf White (Grindal) worm cultures rest on the cover glass inside the light canopy, thriving in this warm situation.

The aquarium at present contains 23 Neons, a single Cardinal Tetra and three Catfishes—one *Plecostomus* and two *Octocinclus*.

Light canopy lifted to show the cover glass resting on rubber strips and also two worm cultures.



The Editor does not necessarily share the view of correspondents.

Plant Specialist Welcomed

SIR,—May I congratulate you on your really wonderful collection of practical articles in this January's issue ?

For years I have waited for articles on Cryptocoryne by that internationally known botanist, Dr. de Wit. Such clear, lucid and, at the same time, authoritative articles can only be written by one who has had a scientific training and long practical experience of his subject.

May there be many more to follow, please !

Forest Gate, FRANK ARNOLD.
London, E. 7.

Basement Fishrooms

SIR,—Several hobbyists over here are doing as a friend and I have done—we purchased our new homes with the principal thought that a large basement or cellar was a " must " !

With a great deal of room available in the basement we have proceeded to build a fishroom and, after installing the tanks and the fishes, we have made over the rest of the basement into a second living room or lounge.

My basement fishroom looks out into the rest of the cellar where there is a television set, phoograph, easy chair, couch, fireplace, bookcases and cabinets. A handy desk, filing cabinet, recessed overhead lighting, etc., are quite customary.

Gas heat from the main house furnace, controlled by a thermostat, keeps all quite warm—above 70 deg.F.

Ohio, DON R. ABEL
U.S.A. (Member of the Board of the International Federation of Aquarium Societies).

Conserving Electricity

SIR,—I was very interested to read in a recent issue that Dr. F. N. Ghadially is at present working on plans for a cedar wood sectional fishhouse, insulated with fibre glass and a hardboard lining.

I erected such a fishhouse just over a year ago. In my structure in. rebated tongued and grooved red Canadian cedar wood was used. The heating is supplied by tubular heaters and lighting by low voltage, the transformer being supplied by Mr. J. E. Edwards who made low voltage lighting popular with aquarists (June 1954 issue of WATER LIFE and subsequent correspondence).

A great advantage of this form of lighting in a fishhouse is that there is no need for glass in the roof, with its consequent heat loss, and the whole roof is insulated with fibre glass and a hardboard lining. The four sides of the house are similarly insulated, making a completely insulated interior, which holds the heat remarkably well.

In conclusion I would recommend that any aquarist who is thinking of carrying out any form of insulation should try fibre glass, as it is cheap, easy to fix, fire and vermin proof and properly used will save many units of electricity.

Catford, J. E. CORNEN
London, S.E.6. (Catford A.S.).

Reactions to Olympia

SIR,—I recently had the pleasure of setting up a furnished aquarium at the National Exhibition of Cage Birds and Aquaria. I should like to offer my thanks for the excellent facilities afforded—clean tank, adequate supplies of hot and cold water, etc.

Leyton, W. J. CHESNEAU
London, E.10. (Secretary, Walthamstow A.S.).

SIR,—Thanks for an excellent show at Olympia. I thoroughly enjoyed it.

Ashtead, C. J. HENTY
Surrey. (Secretary, Kingston A.S.).

For Your Bookshelf

The Reefs of Taprobane*

DURING the last few years the hobbies of underwater fishing and photography have grown tremendously, though only the most hardy of us will indulge in them in our own chilly coastal waters. We can, however, share these sports with the authors of the many books that have been published on these subjects during the past decade.

The present work deals with the reefs on the coast of Ceylon, and describes not only the animal life there, but also the shipwrecks and archaeological remains found in these waters. The author is an experienced skin-diver who also has the unusual ability to write his experiences in a particularly charming and vivid manner.

Two features of this book make it of interest to aquarists. The many underwater photographs in colour show tropical marines in their natural surroundings, and include a picture of a diver catching the poisonous Scorpion Fish, *Pterois volitans*, for the aquarium market.

The other interesting feature is an account of the collecting of freshwater tropicals for export to Europe. The face mask has revolutionised this type of fishing in Ceylon and, with its aid, one sweep of a handnot will sometimes bring up £10 worth of Barbs and Rasboras. The lucky fisherman, however, runs such occupational hazards as meeting with large leeches and crocodiles !

The author makes his subjects very interesting, and the many photographs are superb.—J.S.V.

*By Arthur C. Clarke. 232 pages, 28 plates and endpaper maps. Frederick Muller, Ltd. 25/-.

Midlands Miscellany *by W. L. Mandeville*

EVERY year, since 1865, The Birmingham & Midland Institute—to which the Midland Aquarium and Pool Society is affiliated—has held a "conversazione" for its 2,000 members. This "Festival of the Arts and Sciences" costs about £1,700 to stage, and is an occasion when the City of a-Thousand Trades reviews its illustrious past, and indicates its future plans.

The exhibits this year ranged from "Transport through the Ages" to "Nuclear Generating Stations" and included an aquatic display by the Midland Aquarium and Pool Society. Here the emphasis was on instruction, each of the 30 tanks being fully set with one species of plant only—differing in each tank—and housing a pair of fishes. Thirty species in all were exhibited, with fully descriptive labels on each tank.

Mr. "Dick" Smith, organising secretary of M.A.P.S., did the research work, and hand-printed the display cards. The donkey-work was done by the faithful few, guided as usual by Mr. J. Froggatt, and the fishes expressed their appreciation by breeding, to the amazement of several hundred observers. Shubunkins, Jewel Cichlids, Barbs and Anabantids were busy spawning and hatching throughout the four-day display.

Courtesy

Good manners are the lubricants of life and Mr. Henry Court of the Coventry society is well aware of this. Every meeting finds him hovering between the gate and the meeting room to guide newcomers to the venue, and to welcome visitors.

At the end of the proceedings, he appears quite unobtrusively at one's elbow, chats amiably on the way to the waiting car, to send the visitor on his way with a cheery wave, thereby turning a possible return visit into a certainty.

Inquisitiveness

There is no stronger impulse in the human make-up than inquisitiveness. This trait was turned to good account at the recent dinner of the Walsall Society. Instead of the usual typed slips indicating one's seat at the table, "place-cards" were used bearing the guest's name, and an illustration showing the guest's "other interests". These hand-painted momentoes were the work of the President, Mr. S. Millis-Clarke, and revealed not only his considerable artistic ability, but also the intense interest he has in the membership.

Guests were able to mill around prior to the feast, ostensibly looking for their places, but really getting to know the activities of their fellow-members from these revealing cartoons—each one different.

Members of this society now know that their President and Mrs. Huxley, the treasurer, who refreshed his memory, may appear quietly dignified at meetings, but that they have eagle eyes and alert ears at every assembly.—W. L. Mandeville, 327 Queslett Road, Gt. Barr, Birmingham.

Scottish Commentary *by K. A. M. Robertson*

ONE of the most successful clubs in Scotland at present is Greenock Aquarium Society. This particular society is comparatively young as it was only founded some six or seven years ago. It can always be depended upon to supply a team when there is an inter-club event due to take place and is generally a force to be reckoned with, especially in the inter-club furnished aquarium classes at shows.

In fact the honours in the furnished aquarium class of the Scottish A.S. event have gone to Greenock for three consecutive years. Major awards have also been collected over the country and as far north as Aberdeen.

One of the main reasons for this excellent record must be the unceasing activity on behalf of the Society by the secretary, Mr. D. O. Carr. He holds the combined post of secretary/treasurer and is generally considered one of the foremost aquarists in Scotland. Mr. Carr is also a keen herpetologist.

Allied Organizations

Sometimes there is a tendency by aquarium societies to forget the assistance that can be given by such organizations as zoology departments in universities, Corporation botanical departments and biological stations, both marine and freshwater. Most of these bodies in Scotland are only too pleased to assist societies at show times and also to supply lecturers on request.

In return there is the occasion when, for instance, a botanical garden will be on the look-out for a particular aquarium plant or a Zoology Department will be taking a survey of fish in an area. Often aquarists can be very helpful in supplying either material or information which will save considerable time or expense to the organization concerned.

Furthermore, if aquarists find any form of aquatic life which they know is foreign to the area they can forward specimens, or if this is not possible, at least report the facts to the organization most likely to be interested.

A recent instance of this was when one of the Scottish A.S. members found Miller's Thumb (or Bullhead as it is more commonly known in some districts) in quantity near Glasgow, whereas most of the reference books state that Miller's Thumbs are not found in Scotland.

This point was brought to the notice of Dr. Slack of the Glasgow University's Zoology Department who was most grateful as the Department was, at that time, carrying out a survey of this particular fish.—K. A. M. Robertson, 32 Edzell Drive, Newton Mearns, Renfrewshire.

Societies and individuals in the areas of our correspondents are invited to contact them with news highlights.

News from the North-West *by "Aquaticus"*

YOU would expect there to be more than about 18 fishkeepers in a city like Chester, the county town and capital of the English-Welsh borderland. And, of course, there are; in fact there are at least 200 people who have a fish tank in Chester, but only 18 are in the seven-year-old Chester and District Aquarist Society.

This is a very different state of affairs from the boom days of four or five years ago when the society had about 100 members and prospects were very bright : meetings were held at the public library or other dignified centres, and societies existed in neighbouring towns like Crewe, Wrexham and elsewhere.

It is not that the hobby of fishkeeping has receded. Although the societies at Wrexham and Crewe died out, and Chester's less enthusiastic members fell away to leave only about two of the originals still with the society (notably Mr. J. Bowyers, a past chairman, and without whose generous work as secretary the society might not have survived), societies still flourish at Warrington, Birkenhead, Colwyn Bay and Llandudno.

Chester, like so many clubs, is apparently passing through one of those phases when the nucleus of real workers is keeping things going until the tide turns again. Personally, when I see good societies meeting their difficulties with such unselfish and consistent interest, I feel it is time the local authorities gave more encouragement.

The club's monthly meetings are held on the second Thursday of each month in the club-room over Mr. Bowyer's pet stores and fish shop.

Perhaps many of the 200 missing fishkeepers have not joined because they fear that unless they own a big fishhouse and can talk in technical jargon about fish they have bred, there is no room for them ? Far from that, the society exists for people to come and ask questions and seek help.

Many a person has bought a tank and some fish to amuse the children or decorate the drawing room, and a few elementary difficulties over water temperature, or food, or choice of subjects, has resulted in his giving up the hobby instead of coming along to the club-room as a seeker after advice from people only too willing to help.

Only six of the 18 members are ladies, and they are members' wives. The teachers who would find so much practical advice for keeping tanks in their classrooms either do not know about the club or for some other reason have not become members. "The schools aren't interested in the society ", Mr. Bowyer told me recently.

Four members have fishhouses and another has one under construction. The chairman, Mr. F. Oldbury (a rating officer who may issue you your ticket at Chester General Station) has about 15 tanks and, like all the other members, is a tropical enthusiast.

Pleasant Atmosphere

Although unable to have visiting lecturers, owing to the difficulty of late trains back to neighbouring towns, the Chester society's meetings have a more homely, chatty nature as the members discuss their own interests and problems until they know almost every fish everyone else keeps as if it were their own. For instance, one member gave a talk recently on breeding, another demonstrated glazing and Mr. Sholbroock, an architect, turned his building skill to tank construction.

The club's annual show is, of course, the main event of the year. This was formerly held in the Drill Hall, or the Town Hall, but costs eventually made this prohibitive and, with great success, they have joined in recent years with the cacti society to make a joint show. Both financially and from the public interest, this has been a valuable move by the society.—"Aquaticus", 47 Woodsorrel Road, Liverpool, 15.

South-West Viewpoint *by H. C. B. Thomas*

ARE you still keeping all those resolutions you made a month ago ? If not, and if you still want to feel "good", may I suggest one that you can add to your list and one that is not too hard to keep ? Here it is : "I promise to attend every possible meeting of my society."

I know this sounds very simple but the presence of half a dozen extra members at a meeting can make all the difference between a flat meeting and an enthusiastic one. If meetings are badly attended then the tendency is for members to stay away when the weather is at all poor and to salve their consciences by saying, "Well, there is never anyone there anyway".

Now if this is the state of things but a few extra members turn up, the attitude is much more likely to be, "It was certainly nice to see old X. again, must get along next month too".

A well-attended meeting is also an inspiration to the visiting speaker and to the committee who arranged the programme.

My previous remarks were inspired by the recent A.G.M. of the Bristol Society when I estimated that 50 per cent of the members were present, which I thought was a very good showing. The general rush is to give the A.G.M. a miss.

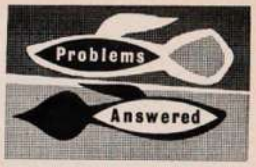
George Harper is the new President of the Bristol Society, and the new secretary is Mr. R. W. A. Savage, 36 Sevier Street, Bristol 5. At the meeting Mrs. Grinsted received a hearty vote of thanks for her services as secretary.

The Bristol & Bath Section of the Guppy Federation hopes to hold its first show in 1958 about May. I heard a whisper that the rules for this show may have something to say about late entries.

Roy Bryant won the Section Cup for the member gaining the most points in open shows. He also took one of the two silver pins gained by the Section.

The new Tropical Study Group is getting down to business at its monthly meetings and a call has already been made on its panel of speakers.—H. C. B. Thomas, 2 Grove Park, Bristol 6.

Queries are answered free of charge by experts. They should be sent to "Fishkeeping", Dorset House, Stamford Street, London, S.E.1, with a stamped addressed envelope for the reply. All queries are answered direct but a selection is published here.



Trouble with Tropicals

I have recently started tropical fishkeeping using an 18 × 10 × 10 in. aquarium but have been unfortunate with my fish and several have died, usually during the night. The temperature is maintained about 75 deg.F. The fish are fed on a well-known food and boiled water was used in the tank.—(F.O.T., Chesham, Bucks.)

From the information given, we feel that the cause of death of your fish is probably overfeeding with dried food. If too much dried food is given the excess falls to the bottom of the tank and decomposes, forming a high concentration of bacteria which will kill the fish. The effect of this would be more pronounced during a period of darkness.

Dried food should be fed in fairly small quantities and never more than can be taken by the fish in a period of five minutes. With the small tropicals this is quite a small amount and it can be given three times a day.

Your other conditions appear to be quite satisfactory, and we would suggest that the tank be emptied, the compost either replaced or thoroughly washed and boiled, and the tank set up once more when no further trouble should occur.

Growing Indian Fern

Could you provide me with some guidance on growing Indian Fern ? It is a plant which has always appealed to me but I have only had slight success with it.—(K.R., Doncaster.)

Indian Fern is rather a difficult plant to get established but, once this is achieved, it proves very prolific. In general the conditions required for good growth are : LIGHT : shaded natural light coming mainly from above the tank. Full daylight in the Spring and Summer months is far too bright and heavy shading is essential, but during the Winter months all available light should be admitted.

TEMPERATURE : 65-75 deg.F. WATER : soft, slightly on the acid side (*p*H : 7-6.8).

COMPOST : Any ordinary aquarium compost is suitable as the plant extracts much of its food from the water. It is usually better to let the plant float on the surface at first until the new plants have thrown out healthy bunches of roots and have grown leaves about 1 to 1 in. long.

The young plants can then be placed in the compost but very great care must be taken to ensure that the crown of the plant is well clear of the compost, otherwise the base will rot away.

Difficulties with a Small Pond

I have a very small, shallow pond in which I had some Carp and a Rudd. They have died from Fungus but I am anxious to restock in the Spring. Would you recommend Golden Orfe for this purpose ?—(E.M.P., Nr. Chelmsford, Essex.)

You do not give the size of your pond but say it is a very small, shallow one. It sounds very much as if you are overcrowding with fishes and disease invariably follows overstocking. You should try to estimate the volume of water in the pond (approximately six gallons to the cubic foot) and allow 10 gallons of water for each 5-in. fish, 8 gallons for 4-in. specimens, and 6 gallons for 3-in. fish and under, always remembering this ratio and reducing the population as the fish grow bigger.

If the pond is 18 in. or less in depth it may be that it is too shallow, especially if it is exposed to the elements. Should this be the case, buy 2-in. fishes in early Spring and a percentage should acclimatize themselves to rigorous Winter conditions.

Goldfish, Carp, Rudd and Tench are all suitable. Golden Orfe are not recommended as they will not survive in a shallow pond.

Fungus only attacks fishes in poor condition so be sure to feed the fishes with chopped Earthworms, mosquito larvæ and live *Daphnia* when available. If the pond lies fallow this Winter and you empty and refill in the Spring, it should be ready to receive new stock.

Kissing Gouramies

I have two young Kissing Gouramies (approx. 1½ in. long). The smaller one continually chases the other. Is this usual ?—(C.B., Blackburn, Lancs.)

Kissing Gouramies are not always peaceably inclined toward their own species and it quite often happens that two of them take a violent dislike to each other and one then tries to maintain its position as master of the tank and thus resorts to bullying.

Water Analysis

SAMPLES **should be sent (NOT delivered by hand) in a clean pint bottle, well packed, to Fishkeeping Analyst, 12 Featherbed Lane, Addington, Surrey, together with a fee of 5s. per sample. Name and address of the sender and details of prevailing conditions should accompany each sample sent. Post-mortem examinations of fishes cannot be undertaken under this service and corpses must not be sent to our Analyst with samples of water.**

Aquaria Section at Olympia Forms a Colourful Display

Stoke Newington and Hendon Share Trophy Honours
Miniature Gardens a Popular Feature

Part of the Aquaria Section photographed before the show opened. Throughout the three-days' duration of the exhibition considerable interest was shown in the fish and reptile exhibits.

THE Aquaria Section (promoted by FISHKEEPING AND WATER LIFE) of the National Exhibition of Cage Birds & Aquaria has become an accepted part of the aquarist's show season. Held in January, it forms a fitting finale and, in so doing, has developed a character of its own.

For three days many thousands of visitors throng the National Hall at Olympia, London; a considerable number are not aquarists, and by presenting fishkeeping to them in an attractive manner excellent publicity for the hobby is achieved. For this reason the prime emphasis is on set-up aquariums.

Clubs and individuals responded as enthusiastically as ever for the exhibition on January 9-11 this year, and 55 entries were made in the three furnished aquaria classes plus a further 10 in an inter-section competition, run by the Guppy Federation.

In the club tropical furnished aquaria there were fewer outstanding entries than usual, though the overall standard was high. For the first time Hendon A.S. topped the prizewinners and won a FISHKEEPING AND WATER LIFE Trophy with an aquarium having a lowered water level.

Above surface it was planted with ferns, Tradescantias and Zebrinas; the one weakness was below the water-line where the fishes did not contrast too effectively. Only one point behind were Hampstead A.S. with an effective design and very good fishes.

The club coldwater furnished aquarium class had an increased entry and quality which would be difficult to improve upon in the Winter season. Stoke Newington A.S. had rich planting and quality Shubunkins in a

Mrs. I. D. Smith standing beside the Guppy Federation's unusual special display for which she was responsible.

design which won them a newly-presented FISHKEEPING AND WATER LIFE trophy. Walthamstow used Golden Orfe in their second prizewinning set-up.

The competition for individual furnished aquaria, both coldwater and tropical, was particularly well supported with 17 entries. The standard of the exhibits compared favourably with that in the club classes.

First prize was awarded to Mr. F. Watts, at his third year of competing. Natural planting and well-blended rock and gravel gave him valuable points. Second and third places went to coldwater tanks, Mr. R. C. Harvey being the runner-up and Mr. R. Mayersbeth the third prizewinner.

Entries in the tropical breeders' classes were not so numerous as in 1957, no doubt due to the new F.B.A.S. ruling of 6-18 months for competing teams of fishes, but there were some commendable exhibits on view and certainly the larger fishes were of greater interest to visitors.

Neons Win First

A worthy first went to Mr. J. Wylie in the egglayers with a beautifully matched team of Neons. Second were some *Corydoras myersi* of Mr. W. A. Bone's breeding and third place was occupied by boldly coloured Aphyosemions from Mr. B. Calrow.

The remaining four teams in the cards (Leeris, Glass Neons, Lemon Tetras and Tigers), were all of top quality; in fact, there was such close competition in this class that only 5 points separated the 1st and 7th prizewinners.

Out of the cards, but nevertheless a top attraction, was a sextet of home-bred Black Angels from Mr. H. C. Parsons.

The breeders' livebearers were led by very large Black Swordtails from Mr. L. Bowd. Black Mollies were second for Mr. J. Horne, whilst strong Berlin Swordtails came third for Mr. J. Northam. Sixth-place takers were some colourful Guppies entered by Mr. Frank Alger, secretary of the American Federation of Guppy Societies.

There was increased representation in the coldwater breeders' classes where Mr. H. V. Jenkins took first place in the Singletail class and Mr. C. Rosewarn's Veiltails were first and second in the Doubletail class.

An innovation this year was the competition for miniature gardens with a pond motif and, whilst just nine of the original 17 entries were staged, it proved one of the most popular features of the Aquaria Section. Exhibitors here had obviously spent a great deal of time and trouble to get artistic effects, and it is to be hoped that such competitions will become regular features of aquarium exhibitions throughout the country. The first

three prizewinners were of an exceptional standard and all in the cards made pleasing exhibits.

Award of Merit for first place in the club points competition went to Hendon A.S. with 46 points. Runners-up (WATER LIFE Diploma) were the Goldfish Society of Gt. Britain with 38.

The hobby's specialist organizations co-operated to the full with displays in the Aquaria Section. Mrs. I. D. Smith, of the Federation of Guppy Breeders' Societies, was responsible for her Federation's exhibit which consisted of ten inter-section furnished aquaria, judged by Messrs. H. S. White and A. J. Holloway, and a model roundabout, complete with flickering lights, showing the recognized Guppy outlines.

The Goldfish Society of Gt. Britain, with Mr. R. Birkenhead in control, designed an attractive stand on which were shown the comparatively new Goldfish varieties known as Mock-metallics, Pseudo-matts and Hammered Metallics.

Each year the British Herpetological Society gets more and more variety in its exhibits—no easy task at a season when many of the creatures are hibernating. This year their vivaria contained such contrasting reptiles as the Mississippi Alligator, a Common Snapper, several varied Terrapins, a Starred Tortoise, Armadillo Lizards, a Boa Constrictor and Algerian Skinks. Mrs. Monica Green, the society's secretary, was responsible for the display.

The Federation of British Aquatic Societies showed some fishes that had taken best-in-show honours during the 1957 season. They included a Piranha belonging to Roy and Gwen Skipper which is always a major attraction when its man-eating propensities are pointed out. Roy Skipper also co-operated by supplying colour transparencies of fishes, etc., which were on display in a special cabinet.

Aquaria Section trade exhibitors reported good business. They were T.F.H. Publications (London) Ltd. on whose stand there were Angel Fishes of the Black, Black Lace and Veiltail varieties, Sterling Fisheries with a wide selection of fishes and accessories on offer and McLynn's Aquatic Foods displaying their fish foods in plastic packs.

It would be impossible to name all the stewards who

APPRECIATION

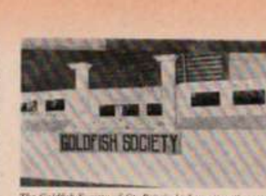
To Mr. V. J. Singleton of Singleton Bros. (Instruments) Ltd., London, S.W.1, who kindly loaned aquarium heaters and aerators.

To the National Aquarists' Society from whom aquaria and staging were on hire, and to Mr. E. B. Lee of Lee, Reid & Co. (London) Ltd., who co-operated with the N.A.S.

gave freely of their time to make the exhibition a success; they were many in number and all were enthusiastic. Mrs. W. M. Meadows once again gave invaluable service as chief steward, and there was full support from the Aquaria Section show committee.

Collectively the Aquaria Section gave brilliant colour to the exhibition and, with an attendance exceeding 24,000 over the three days of its duration, brought the fishkeeping hobby to the notice of many newcomers.

Some of the helpers. L. to r., R. Hamley, B. Meadows, Mrs. E. Riddle, Mrs. W. Meadows (chief steward), Mr. and Mrs. E. Walker-Bagg, E. H. Riddle and J. E. Searle.



The Goldfish Society of Gt. Britain had an attractive stand at the exhibition on which three comparatively new Goldfish varieties were shown.

CLASS RESULTS AND VIEWS OF THE JUDGES

CLASS A1, CLUB TROPICAL FURNISHED AQUARIA (23): 1, Hendon A.S. (79 points); 2, Hampstead A.S. (78); 3, Portsmouth A.S. (77); 4, Walthamstow A.S. (76½); 5, Hendon A.S. (76); 6, Walthamstow A.S. (71); 7, Hendon A.S. (70).

Officiating in Class A1 were **Messrs. C. W. G. Creed and H. R. Holland.** Mr. Creed comments: "The club tropical furnished aquaria this year did not provide an 'original' aquarium but the prizewinners have set up tanks that were greatly admired.

"The winning exhibit, with the top half set out as a terrestrial waterside and the lower half as a river bed, proved most attractive. The failing here was that the fishes were not chosen with sufficient colour to show themselves against the 'river bank'.

"Mention must also be made of the second award for its attractive rockwork and shoal of very fine Zebras. Most of the other entries needed a little more care with the arrangement of the rockwork and plants."

Mr. H. R. Holland writes: "The standard was generally somewhat below average for this exhibition. The first prizewinner was an exception to this and showed a fairly new and pleasing variation but the fish would have enhanced this exhibit more if they had been of a variety with fuller colour. Whilst this half aerial tank is a pleasing variation of the stereotyped formal tank there is still much room for improvement in this field.

"The 'bread-and-butter' Zebra Fish in the second prizewinning tank helped to bring it into the awards. There were some really good rocks and excellent plants and fish in the show but they just did not seem to be combined in the same tank. Possibly a club can only produce an everyday variety of fish, but one would consider it possible to get near maximum points for plants and rockwork. A real club effort for plants and rockwork will greatly assist in this direction."

Club Coldwater Class

CLASS A2, CLUB COLDWATER FURNISHED AQUARIA (13): 1, Stoke Newington A.S. (87); 2, Walthamstow A.S. (83); 3, West Middlesex A.S. (82); 4, Portsmouth A.S. (78); 5, London Transport (C.R.S.) A.S. (76); 6, Bethnal Green A.S. (71); 7, Hendon A.S. (70).

Judging class A2 were Capt. L. C. Betts and Mr. C. J. Saunders, B.Sc. Capt. Betts had this to say: "The entry for this class seemed to be up to the usual standard with the added advantage that those hastily assembled entries, common at many shows, were missing. This is as well because poorly conceived entries tend to make mediocre exhibits appear better than they really are. The winning tank was well executed with a nice balance between fish, plants and rockwork. The plants were of good quality combining the many shades of green in a delightful way.

"The second place was taken by a nice team of four medium-sized Golden Orfe whose colour blended pleasantly with the well-planned background. The rocks

were well chosen although the fine sand compost could be misleading to the novice.

"In the third place was an entry that exploited the three-dimensional motive very successfully. It was a pity that below-average quality fish down-graded an exhibit which could have had a higher place."

Mr. Saunders, added: "There was a goodly entry with several very attractive layouts; the general standard was, in my opinion, slightly better than last year. However, the same very obvious mistakes were made by some of the competitors.

"The first of these was the use of poor quality plants. Appreciating the fact that it is a difficult time of the year for coldwater plants, it is better to leave a plant out rather than include one of poor quality. *Vallisneria* was noticeably poor, while blanket weed was visible in some cases entwined around plants. There is also a tendency to overplant with fast and free-growing plants which is not good for permanency.

"In at least two cases the exhibit was spoiled by very poor fishes. It was noticed, however, that previous advice and criticism had been noted with respect to overcrowding and no tank was overpopulated."

Individual Furnished Aquaria

CLASS A3, INDIVIDUAL FURNISHED AQUARIA (17): 1, F. Watts (82); 2, R. C. Harvey (81); 3, R. Mayersbeth (77); 4, W. L. Wilson (75); 5, C. T. W. Blagrove (74); 6, H. Groves (73); 7, W. G. Farr (71).

The judges of class A3 were Messrs. J. H. Gloyn and B. Meadows. Mr. Gloyn writes: "In this class the general standard continues to improve and a number of the entries compared favourably with many of the club exhibits. This year the entries followed the traditional layouts, experiments being conspicuous by their absence. One or two exhibitors lost points by placing too many of the larger fish in their tanks, and others would have gained by a little more attention to the tidiness of the plant layout.

"The condition of the plants generally was very good considering the time of the year. Quality of the fishes was also quite good. The winners are to be congratulated, and I feel sure that several who did not gain awards will do so before very long."

Mr. Meadows adds: "The support given to this class was very encouraging and if this trend continues we shall be able to consider two classes for individual furnished aquaria—tropical and coldwater. The standard was higher this year and was, I think, approaching the quality of the club exhibits.

"The winning tank was a pleasing picture with the rockwork matched by graduated compost of the same shade. There was a very good selection of good plants in it and the fish were of very fine quality and condition.

"The runner-up was a very good coldwater effort, in which a nice Shubunkin was shown to advantage with rockwork and compost matching in a setting of good plants."

Breeders' Classes

CLASS A4, BREEDERS' TROPICAL EGGLAYERS (18): 1, J. Wylie (88); 2, W. A. Bone (87); 3, B. Calrow (86); 4, R. Walford (85); 5, Mrs. B. Robertshaw (84½); 6, Mrs. B. Robertshaw (84); 7, W. A. Ryan (83). Messrs. C. W. G. Creed and J. H. Gloyn were the judges.

CLASS A5, BREEDERS' TROPICAL LIVEBEARERS (11): 1, L. Bowd (88); 2, J. Horne (84); 3, J. Northam (83); 4, W. G. Phillips (82); 5, L. G. Ayres (81); 6, F. Alger (79); 7, I. G. Flintham (77). Messrs. R. G. Mealand and H. R. Holland were the judges.

CLASS A6, BREEDERS' SINGLETAIL GOLDFISH (8): 1, H. V. Jenkins (80); 2, Miss D. Morris (78); 3, Miss D. Morris (73); 4, M. D. Chase (71); 5, M. D. Chase (70); 6, T. Sherwood (63); 7, T. Sherwood (55). Capt. L. C. Betts and Mr. B. Meadows were the judges.

CLASS A7, BREEDERS' TWINTAIL GOLDFISH (9): 1, C. Rosewarn (79); 2, C. Rosewarn (78); 3, R. H. I. Read (77); 4 (tie), both J. Goodman (70); 6, S. C. Halsey (64); 7, M. D. Chase (57). Messrs. A. Boarder and C. J. Saunders, B.Sc., adjudicated.

First prizewinner in the miniature gardens class was Mr. W. Puddicombe with this well thought-out design.

Miniature Gardens

CLASS A8, MINIATURE GARDENS, WITH A POND MOTIF: 1, W. Puddicombe (82); 2, B. Meadows (80); 3, F. Oliver (79); 4, Mrs. I. D. Smith (75); 5, M. D. Chase (74); 6, D. J. Robinson (73); 7, J. Horne (68).

Mr. A. Boarder, the judge of this class, writes: "This was a new feature of the exhibition, and proved a great attraction for the visitors, the only grumble being that there was none of the gardens for sale!

"It gave me great pleasure to judge the class, and I consider that the standard of most of the exhibits was very high. The stipulation in the show schedule was that they were to be judged for attractiveness.

"The first prize entry was very nice indeed and a particularly pleasing feature was the painting of the path and garden carried down over the front edge of the container. The actual garden showed a well-executed path leading up to a seat under a tree.

"The second-prize exhibit was an excellent entry but lost a few points owing to the fact that the front edge of the container was so high that it hid a large part of the foreground of the garden. This exhibit was very close to the winner.

"The third-prizewinner was rather spoilt by the grass verges which were anything but green. Also the path in the garden disappeared in a bush and led nowhere.

"The entry which took fourth prize was very attractive with a rather formal pond and a very fine statue in the centre. It was a pleasing effort but was rather spoiled by the contemporary wallpaper which covered its container.

"Fifth prize went to a very formal type of garden but the metal container detracted from its general appearance and there was lack of colour in the exhibit. The entry which gained sixth was a very nice rockery effect, beautifully executed, but the container was too heavy for the size of the garden. A good effort took seventh prize and this had a small greenhouse and formal-type beds. Unfortunately the concrete looked too new and unweathered."

Guppy Federation's Class

FEDERATION OF GUPPY BREEDERS' SOCIETIES INTER-SECTION FURNISHED AQUARIA (10): 1, Portsmouth (71); 2, Portsmouth (64½); 3, Eastern Counties (64); 4, North London (63); 5, Eastern Counties (62½); 6, Basingstoke (57½); 7, North London (56).

Presentations to Retiring F.B.A.S. General Secretary

MR. R. O. B. LIST, who retired from the position of general secretary to the Federation of British Aquatic Societies at the F.B.A.S. annual general meeting on December 21, received a clock and a cheque in appreciation of his services to the hobby during his lengthy period in office. Mrs. List also received a gift.

Mr. S. Atkins, Mr. C. W. G. Creed and the F.B.A.S. Council organized the presentation, and subscriptions came from home and overseas. German aquarists, who were unable to subscribe to the fund owing to currency restrictions, sent bound volumes of German aquarium literature, and these were also given to Mr. List, who will continue to serve the Federation as a Council member.

Mr. List's successor as general secretary is Mr. F. Rose, 33 Nassington Road, London, N.W.3 and he will be assisted by Messrs. L. Coatman and K. J. A. Pye. Mr. C. W. G. Creed was re-appointed vice-chairman, and council members elected were Mrs. W. M. Meadows, Mr. Filmer, Mr. Patch and Mr. L. Coatman.

There were no nominations for the post of engagements secretary but, since the A.G.M., Mr. A. H. Gale, 18 Chesterfield Grove, East Dulwich, S.E.22, has agreed to take on these duties. Mr. C. Matthews offered to continue as treasurer and this was agreed to.

It was reported that affiliated societies numbered 93 (plus three overseas organisations) in 1957 compared with 98 in 1956. In the treasurer's report a surplus of £13/6/1 for the year was shown. There was a credit of £11/14/2 in the hospital tank fund and a credit of £6/11/- in the World Federation Fund.

Mr. L. Coatman gave the engagements secretary's report. There were 94 London and 80 provincial bookings in 1957.

Mr. J. H. Gloyn, in presenting the judges and standards report, told of the contemplated new pointings for coldwater fish. These were:—Type and colour, 40 points; Finnage, 20 points; Body, 20 points; Deportment and general condition, 20 points.

He also spoke of a new Award of Merit which will be presented for "any outstanding achievement of interest or benefit or use to the bobby".

Mr. A. E. Izzard

IT is with sincere regret that we record the passing in December of Mr. A. E. Izzard of Angel Electrical Industries Ltd.

Mr. Izzard, who was keenly interested in fishkeeping, had close associations with our hobby and was vice-president of the Enterprise A.S. up to the time of his death, apart from being connected with one of the largest manufacturers of electrical aquarium equipment. Our condolences are extended to his wife and family.

Investigations by the Goldfish Society

EXPERIMENTS in which members of the Goldfish Society of Gt. Britain will participate in 1958 will concern the temperatures at which spawnings occur, continuous recording of tank temperatures and the amount of food consumed by fish.

First meeting of the society is on March 15 in the George Hotel, Hammersmith Broadway, London, when a talk on "Colour Patterns" will be given by Mr. R. E. Ross, B.Sc. and Mr. R. J. Affleck, M.Sc. will speak on "Shapes in Singletails". The table show will be for light Singletails.

On May 2, at the same venue, members will hear Capt. L. C. Betts speak on "Imperfect Fish" and Mr. Affleck discuss, "Heads of the Basic Varieties".

Co-operation for Taunton Show

ON January 10 and 11 Taunton A.S. presented the third public exhibition it has held in the last nine months which consisted of 25 coldwater and tropical exhibits.

Mrs. H. G. S. Cox was congratulated on her arrangements for the tropical section. She also obtained the co-operation of the Plymouth Laboratory of the Marine Biological Association, who loaned sea creatures such as Hermit crabs, star-fish, anemones, sea-ferns and other sea-worms for the exhibition.

Mr. M. Finn, A.R.C.A., who is on the staff of the Somerset College of Art, judged the tropical tanks in order of artistic merit. His placings were:—1, Mr. R. Saunders; 2, Mr. D. Baysdon; 3, Mrs. H. G. S. Cox.

Judging for the best fish in show was carried out by Mr. G. A. Murdoch who gave the premier position to a Tiger Barb owned by Mr. E. Egglestone. From this Mr. Egglestone won the Mrs. Murdoch Cup, which was presented at the club's A.G.M. on January 15. At the same time the Aggregate Cup was awarded to this year's winner, Mr. R. Saunders.

Among business conducted at the meeting was the election of officers for the ensuing year:—secretary, Mr. R. Saunders; chairman, Mr. E. Egglestone; treasurer, Mr. C. Scott and show secretary, Mrs. H. G. S. Cox.

Workers Honoured

AT the Hendon society's annual dinner, dance and social held in January the President's Trophy for "club spirit" was awarded to Mr. Tom Tapner, who is the storeman of the society's show equipment.

It is Mr. Tapner's claim that every item in the stores (including 700 tanks) is clean and ready for service at all times, and this has proved an every night of the week job for him.

The Memorial Trophy for the member who has done the most for the hobby in the past year was awarded to Mrs. Betty Robertshaw, who is the club's secretary.

In deciding the award, it was shown that Mrs. Robertshaw had probably the most comprehensive file of facts on fish breeding in the country, and has collated experiences from the world's fish magazines, with club and personal experiments.

Quality Fish Shown by Friends A.S.

AT a coldwater fish show, arranged by Friends A.S. (South-west London) recently, first and second awards went to Mr. H. St. Ledger with 86- and 83-point exhibits. All fish benched for the competition received maximum points for condition.

On December 12 the society had its "hard luck" show for members who have not taken any awards in any classes throughout the year. Although there were only 20 entries the quality of the fishes was astonishingly high with the first three places going to Dwarf Gouramies and Pencil Fish entered by Mr. B. Scutts and which gained 93, 92 and 91 points, respectively.

New Facility for Members

A NEWSLETTER is now being produced by Brockley Breeders' Circle. The first two issues contain useful information which members are encouraged to keep for reference. Material for the newsletter (of which Miss D. Goff is the editor) is taken from lectures by visiting speakers and talks by the society's own members.

Guppy Federation's Officials

OFFICERS of the Federation of Guppy Breeders' Societies nominated for 1958 were Mr. W. Howe, vice-president; Mr. A. G. Ashman, general secretary; Mr. R. Alley, overseas secretary; Mr. R. Forest-Jones, B.Sc., show secretary and Mr. P. Rodsall, show organizer.

The show organizer and overseas secretary were not resigning as stated in the November F.G.B.S. bulletin and referred to in last month's FISHKEEPING. The nominations, as given above, were due to be confirmed at the Federation's A.G.M. on February 1.

Annual show of E. Midlands Section was held on November 30 when the section's secretary, Mr. L. Matthews, won three silver pins, bringing his total to 20 and qualifying him for a coveted gold-jewelled pin.

Club items for the March issue should arrive not later than Monday, February 17.

● A number of changes in the officials of **Glenrothes A.S.** are reported. Mr. D. Watson is now the treasurer and Mr. H. M. Scott, 52 Croft Crescent, Markinch, Fife, the secretary. Interclub table shows have been arranged between the Kirkcaldy, Leven and Glenrothes clubs. Two classes of fish will be shown at meetings which will be held in alternate months.

● Officers of **Erith A.S.** for the current year are chairman, Mr. E. Croucher and secretary, Mr. B. I. Bothwell, 46 Shipgiewell Road, Erith, Kent. The society's annual trophies were presented at the January meeting. They went to Mr. A. Percival (Points Trophy), Mr. G. Baker (livebearers), Mr. E. Croucher (eggla yers and plants) and Mr. D. Cooper (Swordtails).

● A new secretary was elected at the A.G.M. of **Hornsey A.S.** He is Mr. B. R. Ramsey, 11 Weybridge House, Woodberry Downs, London, N.4. Other officials appointed were President, Councillor G. Watson; chairman, Mr. F. Putterill; vice-chairman, Mr. G. Rutt; show secretary, Mr. E. Smith and treasurer, Mrs. B. Putterill. A social evening has been arranged for February 18 and visitors will be welcomed.

● Mr. G. W. Hedger, 67 South Avenue, Southend-on-Sea, Essex, is the new secretary of **Southend, Leigh A.S.**

● Meetings of **Burton A.S.** are held on the second Wednesday of each month in Room 3 of the Workingmen's Club, Orchard Street, Burton-on-Trent. Officers elected at the A.G.M. were chairman, Mr. W. G. Fretwell; treasurer, Mrs. K. Durlow and secretary, Mrs. T. Henshaw, 58 High Street, Newhall, Burton-on-Trent.

● The **Peterlee Aquarist Society** has recently been formed with Mr. J. Hewlisce as chairman, Mr. H. Robson, treasurer and Mr. John Edwards, 47 Acre Rigg Road, Peterlee, Co. Durham, secretary.

● Mr. W. J. Chesneau, 44 Capworth Street, Leyton, London, E.10, was appointed secretary of **Walthamstow A.S.** at the club's A.G.M. on January 15. The chairman for 1958 is Mr. H. Lobley and the treasurer, Mr. D. Goldsworthy. The new show secretary is Mr. G. Howe.

● As a result of the A.G.M. of **Bristol A.S.** the following persons will officiate for 1958. President, Mr. G. Harper; vice-president, Mr. Macloughlan; secretary, Mr. R. W. Savage, 36 Sevier Street, St. Werburgh's, Bristol; treasurer, Mr. F. S. Lannox and reporting secretary, Mr. V. Capaldi.

● A full programme of lectures and table shows has been arranged by **Bexhill A.S.** for its meetings which are held in the Merrythought Cafe, Western Road, Bexhill, on the first Thursday of each month. Local fishkeepers, who are interested in the society, should contact the secretary, Mr. J. Holder, 19 Selwyn Road, Eastbourne, Sussex. The club is in a strong financial position and has half-a-dozen keen, new members.

● At the recent A.G.M. of **Riverside A.S. (Hammersmith)** Mr. Barnes was appointed chairman; Miss Watson, vice-chairman and treasurer; Mr. E. Daynes, show secretary and Mr. T. Thewless, "White Building", Barley Mow Passage, London, W.4, secretary.

● The **Kingston A.S.** welcomes prospective members to its meetings. The secretary is Mr. C. J. Henty, 120 Craddocks Avenue, Ashtead, Surrey. Mr. R. H. I. Read lectured on "Breeding Fancy Goldfish" at the January 2 meeting and, on February 6, there was a talk on "Water Properties". Members will try their hand at judging at the February 20 fixture.

● Over 30 children attended the party arranged for them by **Corby A.S.** on January 11. A film was shown at the January 22 meeting.

● There was a slight reorganization in the committee at the **Coventry A. & P.S. A.G.M.** The following officials were appointed. President, Mr. P. O. Smith; chairman, Mr. G. Glover; secretary, Mr. F. Prescott, 3 King's Grove, Coventry, and joint show secretaries, Mr. F. Randall and Mr. J. Ellis.

● Ninth annual show of **Bethnal Green A.S.** will take place on September 5-6 of this year. The club's annual social evening will be held on March 29. Clubs interested in these events should contact the secretary, Mr. A. H. Scott, 80 Ellerman Street, Poplar, London, E.14.

● The cup awarded annually to the **Herne Bay A.S.** member gaining most points in monthly table shows has been won by Mr. J. Pascoe. Officers elected at the January 16 A.G.M. were chairman, Mr. W. Lee; vice-chairman, Mr. J. Pascoe; treasurer, Mr. S. Barnes and secretary, Mr. J. Miles, 21 Sunnyhill Road, Herne Bay, Kent. The retiring chairman, Mr. J. Weaver, has presented a new trophy for monthly competition. Meetings are held on the third Thursday of each month at the Railway Hotel, Station Road, Herne Bay.

● A full programme for 1958 has been arranged by **Staines A.S.** It includes several table shows and talks. At a recent show with Spelthorne A.S. Staines won by a narrow margin. The secretary of Staines A.S. Mr. P. Whitehead, was re-elected at the club's A.G.M.

● At the annual social evening of **Hampstead A.S.** on January 18 trophies and awards of merit for 1957 were presented by the Mayor. Mr. P. R. Utton won the trophies for Carps and Minnows, Characins and plants, Mr. T. Pilgrim those for labyrinths, livebearers and breeders' exhibits, Mr. L. Coatman the trophies for Catfish, Cichlids and Tropical points and Mr. L. G. Lawrence the cups for coldwater points and best fish at the annual show. A number of the F.B.A.S. officials were present at the social where Mr. Gordon Murray was the master of ceremonies.

● Members of the Tavistock and Exeter societies were expected to be present for the **Plymouth A. & P.S.** annual dinner and dance held on February 1. Recent programme of the Plymouth club has included a film show, and a "Speak Your Mind" session in which members participated.

● The breeding programme for 1958 was discussed at a recent meeting of **Bristol Coldwater Fish Breeders' Group.** Shubunkins and Red-scaled Veiltails were the fishes mainly considered.

● As a result of the A.G.M. of **Romford A.S.** the following officials were appointed for 1958; President, Mr. Hammond; chairman, Mr. Thompson; treasurer, Mr. Wilson and secretary, Mr. O'Farrell, 9 Wych Elm Close, Hornchurch, Essex.

● New secretary of **Lambeth A.S.** is Mrs. C. G. Rundle, 7 Luxor Street, Camberwell, London, S.E.5.

● A progressive year with increased membership was reported at the A.G.M. of **Colwyn Bay A.S.** when Mr. A. L. Clayton was appointed chairman; Mr. J. R. Reed, vice-chairman; Mr. W. Barton, treasurer; and Mr. H. Warsop, 8 Abergele Road, Colwyn Bay, N. Wales, secretary.

● Present secretary of **Bournemouth A.C.** is Mr. N. Walker, 24 Denmark Road, Poole, Dorset.

● A **West London Guppy Breeders' Society** was formed in December. Meetings are held on the last Monday of each month at Westcott Lodge, 11 Lower Mall, Hammersmith, W.6.

● Mr. B. A. Curtis spoke on "Livefoods and Filtration and Aeration" at the January 8 meeting of **Guildford A.C.** The club's A.G.M. takes place on February 12.

● Present secretary of **Sheffield A.S.** is Mr. R. P. Middleton, 37 Tavistock Road, Sheffield 7.

● The coming fishbreeding season was discussed at a recent meeting of the **Carassius Club (Portsmouth).** Plans were made for the loan of two good fish to members and a share-out of the resulting fry.

● Twenty-one members and friends of **Aylesbury A.S.** attended the society's annual dinner which was held recently.

● Mr. J. Atkinson received the Phil Smith Novices Tropical Trophy at the A.G.M. of **Dunstable A.S.** on January 7. Mr. W. Holdstock won the Mrs. E. A. Green Cup for most points gained in table shows. Winner of the trophy for most points gained at junior table shows was Roger Bates.

● The **Independent A.S. (Islington)** is enjoying a successful season and is now stronger in membership and enthusiasm than ever before. Regular lectures are given by Mr. E. H. Riddle. Meetings are held every Monday at the Islington Men's Evening Institute, Hornsey Road, London, N.7, and prospective members will be welcomed.

● A number of Solford members attended a recent meeting of **Middleton A.S.** addressed by Middleton's secretary, Mr. Partington.

● Mr. W. Hall was re-elected chairman of **Streatham A.S.** at the club's A.G.M. and Mr. Leadbetter was re-appointed treasurer. The new secretary is Mr. G. Stringer and Mrs. M. D. Hall takes over as show secretary and publicity officer.

● The inaugural meeting of **Oxrun Social & Athletic Club (Shaw) A.S.** was held in the late Autumn when Mr. D. G. Powell was elected chairman and Mr. P. Dixon, secretary and treasurer. Meetings are held on the first and third Wednesdays of each month and members of other societies are given a cordial invitation.

● Another society to have a new secretary following its A.G.M. is **Leyton A.S.** He is Mr. F. E. Bland, 121 Forest Lane, Forest Gate, London, E.7. Other officials elected were Mr. J. Procter, chairman; Mr. A. Offord, vice-chairman; Mr. J. Kaston, treasurer and Mr. A. Watson, Snr., show secretary. The table shows for 1957 resulted in Mr. P. Jenkinson winning first prize. Meetings of the society are held on the second Monday of each month at Leyton Town Hall.

● In recent months the **Rolls-Royce Ltd. Hillington Aquarium Club** have paid a visit to the Royal Scottish Zoological Park in Edinburgh and heard a lecture by Mr. J. Stewart of the Scottish Aquarium Club on "An Aquarist in Malaya".

● Mr. W. L. Mandeville from Birmingham will address the February meeting of **Nottingham A.S.** Mr. C. D. Roe spoke on "The History and Development of Fishes" at the January gathering.

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continued next page

Fish—*continued*

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continued next page

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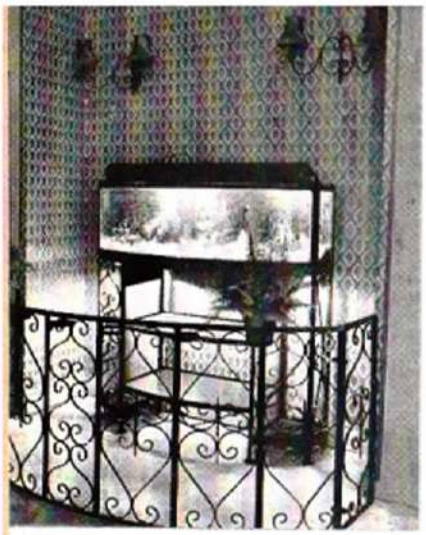

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