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VOL. 13 NO. 5
NEW ISSUE
MARCH 1958

FISHKEEPING
and Water Life

IN THE SWIM

Goldfish for Juniors · From Africa
Labeo Spawned · Black Fighters
Australian Reptiles · Deep Freeze
Combined Shows · Devon's New Club

• **Young blood.** With an eye to the future and a show of good judgment, the Goldfish Society of Gt. Britain is inaugurating a Junior Section this year. The first meeting will be in the New Parish Hall at Hammersmith Broadway, London, at 6 p.m. on May 30.

This is an important date for all young coldwater fishkeepers. The Society's President, Mr. R. J. Affleck, M.Sc., will give an introductory talk and specimen fish will be on view.

• **African Tooth-carps.** Now that the lovely *Nothobranchius* Tooth-carps are available in Britain the article on page 227 by Gerry Rowe from Tanganyika is of topical interest. To know how a fish lives in its natural haunts is a great help when we try to breed it under aquarium conditions. Although we do not necessarily have to reproduce slavishly the conditions it is used to in the wild, certain basic principles can be learned which will save us a great deal of time.

W. C. Cleveland (W. Croydon, Surrey) wrote me a short while ago to say that he had had *Nothobranchius neumanni* (illustrated in Gerry Rowe's article). His specimens grew to 1¾ in. and had bluish-grey body colour with scales edged carmine red. The eyes were brilliant green and the caudal fin was carmine red.

Mr. Cleveland hazarded a guess that this species had a life span of only 6-8 months. The fish spawned in his aquaria but no young resulted. This, Mr. Cleveland thought, was because he did not drain off the water after the eggs had been laid, as recommended by Gerry Rowe in this issue.

• **Red-tail Success.** James Ellis of North Hollywood, California, has had Red-tailed Sharks (*Labeo bicolor*) spawn. Seven Red-tails were in a 35-gallon tank planted with Amazon Swords and Cryptocorynes and with alkaline water of *p*H 7.8 at 80 deg.F. Two of the fishes took up a side-by-side position and laid adhesive eggs which fell to the bottom. The other Labeos followed the breeding pair around the tank but took no interest in the eggs.

Spawning continued for about two hours. Unfortunately all the eggs were fungused in seven hours. Nevertheless this achievement is a real one by which Mr. Ellis adds to our knowledge. It was recorded by Diane Schofield in the December issue of "*All-Pets Magazine*".

Red-tailed Shark, a species which has been spawned in the United States. Photograph, L. E. Perkins.

• **Black Magic.** Not a stone's throw from the FISHKEEPING & WATER LIFE's office in S.E. London lives D. Williamson, an aquarist who is intrigued by black colouring in fishes. He had some of the first Black and Black-lace Angel Fish to come into Britain but had the misfortune to lose the all-black specimens just as they were getting to a mature size. He has bred the Black-lace fishes with moderate success.

About the time he was having trouble with the Black Angels in 1956 he produced a Fighting Fish (*Betta splendens*), which showed a fair percentage of black colouring; it was a male with the lower part of its body and bottom

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fins very nearly a full black, although the upper body and dorsal fin showed a distinct reddish-purple tinge.

A visit to Mr. Williamson last Summer proved that he had made good progress in his pursuit of the Black Fighter. He then had very few fishes where all the fins were black, although the bodies still carried some red, green or blue.

News then was that the latest spawnings contained about a dozen fish with evidence of black, that the black fishes definitely seemed more pugnacious than the usual colours and that they appeared to be rather smaller. Mr. Williamson wonders whether this smaller size has resulted in other breeders throwing away promising specimens believing them to be runts.

This aquarist now has a Black Fighter from Germany which he hopes to cross with some of his own fishes as there are signs that his strain requires fresh blood to maintain its vigour.

● **Rare Reptiles Bred.** P. Millet reported in the last issue that a North-west importer had recently brought in a consignment of rare Australian reptiles. One of them was the skink species, *Tiliqua occipitalis*. Robert Jackson, the importer concerned, now tells us that one of these skinks has given birth to five living young which he is rearing successfully.

R. Skipper picture of the tropical loach, Botia modesta. *See "Sturdy Loach" paragraph below.*

● **Sturdy Loach.** That green-grey tropical loach with the red fins, *Botia modesta*, seems to be a tough customer. Helen R. Gibson (Newcastle-on-Tyne) tells of an incident that occurred when she was transferring a *B. modesta*, with other loaches, from her fish-house to an aquarium in her home.

The night was a snowy one and on the journey from the fishhouse to her home Miss Gibson lost the *B. modesta* from its container. A frantic search revealed the fish half buried in the snow and apparently dead. It was placed in a bucket of water at 75 deg.F., whilst the other loaches were introduced to their new aquarium.

The bucket was then carried away to be emptied but it was noticed that the *Botia* was breathing rapidly. More out of sentiment than with any high hopes, the fish was put in the tank with the other loaches.

Next morning it was swimming about as though it had never left its aquarium and it has shown no ill-effects since.

Statistics are that the temperature of the water from which it jumped was 80 deg.F. and that the air temperature outside, where it lay in the snow for about 1½ minutes, was 17 deg.F.

● **Pooling Resources.** Many clubs would like to stage a competitive show but are unable to do so because of the financial burden involved. C. Henty from Ashtead, Surrey, puts forwards a personal idea, not new, but certainly relevant as we look forward to the Summer and Autumn exhibitions.

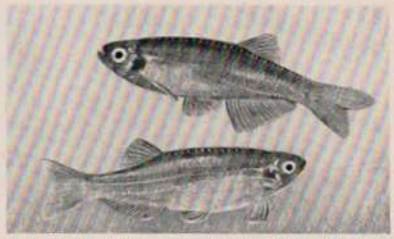
"Could not several clubs in a particular area team together to make a fully comprehensive show possible?" he asks. Readers will recall that it was just such a viewpoint that Cecil W. G. Creed expressed in our January issue.

Several folk seem to have similar feelings and it is now up to each club to share its aspirations with its neighbours. The result could be a greater number of exhibitions—a happy prospect—and, even more important, fish shows staged with the costs divided and less worry for the individual organisations concerned.

● **Devon Activity.** After many years' service to societies in London and the Home Counties, Mr. H. N. Allies last Spring took over as Aquarium Curator at Paignton Zoo, Devon. Not surprisingly he has now formed an aquarium society in the town.

The inaugural meeting of Paignton Aquarists' Society took place on January 24, when 18 members were enrolled. Mr. H. N. Allies, East Lodge, Clennon Park, Paignton, is the secretary. Mr. N. H. Dixon, F.C.A., the President, Mr. O. H. Jackson, the chairman, and Mr. G. Pullin, the treasurer. Meetings are held on the second and fourth Tuesdays of each month, commencing at 7.30 p.m., in the Paignton Zoo Restaurant.—L.W.A.

TWO DISTINCTIVE TROPICAL FISHES



Pair of Brachydanio kerri. *The authors have spawned this species.*

A Danio and a Characin comparatively new to Britain

by ROY & GWEN SKIPPER

PHOTOGRAPHED here are two tropical fish species that are comparatively new to this country. One is the Characin, *Hyphessobrycon griemi*, and the other is *Brachydanio kerri*. Readers will recall that we mentioned these fishes in our article on pages 205-207 of the October 1957 issue and a full description of them was given by P. Millet in the January 1958 number, by which time they were obtainable in Britain.

Sex differences in both species appear to be indicated by proportion only, coloration and markings being identical in the male and female. In the photographs the male is the upper fish.

Our *B. kerri* and *H. griemi* now appear to be mature and the *B. kerri* measure 2 in. long. The *H. griemi* are 1¼ in. long in the case of the males, and 1¼ in. in the females. Both species enjoy the company of other small Characins and Rasboras. They are happy at a temperature of 72-75 deg.F.

Feeding presents no difficulty as they readily take proprietary dried foods, chopped White Worms, *Daphnia*, scraped meat, etc.

Just as we write in mid-February we have our first spawning of *B. kerri*. The eggs were non-adhesive and hatched in six days. The water in the breeding aquarium was not specially selected but was merely what happened to be available; its *p*H was 6.0 and its hardness, 80 p.p.m. There was a pebble bottom to the aquarium and two pairs of adult fish were used.

The newly hatched fish are ¼ in. long and very dark in colour, making them easy to see. The young appear to number about 200 and are taking a proprietary liquid fry food as their first nourishment.

Pair of Hyphessobrycon griemi. *The female is the larger fish, below. Photographs by R. Skipper.*

FISH ENEMIES

Dragonfly Nymphs

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

Illustrations by the author

A long-bodied Dragonfly nymph. This type can be troublesome in garden ponds.

RETURNING once more to the smaller denizens of ponds, the next creatures that call for consideration are the early stages, or nymphs, of the various kinds of dragonflies. The beautiful adult insects are well known to every frequenter of the water-side but it often causes surprise to the uninitiated to learn that the early stages of these insects are somewhat ugly creatures that spend varying times up to three years at the bottom of the pond.

Three Dragonflies

Three types of dragonflies are recognizable: the large, long-bodied kind, often called Hawker Dragonflies; the shorter, broad-bodied type and the slender Damselflies which flutter feebly near the water's edge. Each of these three has its characteristic kind of aquatic nymph and two are illustrated. All are carnivorous, devouring any small creatures, including small fish-fry, that they can catch.

For such sluggish creatures it is amazing how efficient is their catching technique. They do not normally chase their prey but lie in wait for it and when any suitable meal is within reach, powerful hinged jaws, usually folded away under the head and called the "mask", are shot out and the victim secured by the pair of claws at the end of the structure. In this merciless grip it is then brought into contact with the mouth-parts and devoured.

Nymphs of the first two kinds of Dragonflies mentioned are the only ones that need concern the pondkeeper. The small Damselfly nymphs are unlikely to do much harm. All of them cling tenaciously to water-plants and in this way can be introduced on newly-introduced plants.

The small Damselfly nymphs, which are unlikely to prove very harmful to fishes in ponds.

Method of Egglaying

Adult dragonflies are on the wing in Summer and may frequently be seen laying their eggs over garden pools. Some merely dip the tip of their abdomen under the surface of the water as they fly over; others rest on aquatic plants and deposit their eggs more leisurely in slits made in submerged stems.

It would be as well to net any adult insects seen flying over garden pools—but it will not be an easy task for some of the dragonflies have compound eyes made up of some 8,000 separate eyes so that they have, literally, eyes all over their heads!

BREEDING TROPICAL EGGLAYERS

The Nigger Barb (Barbus nigrofasciatus), *one of the easiest Barb species to breed.*

LARGE AND SMALL BARB SPECIES

by D. B. McINERNY

SINCE most Barbs are colourful, peaceful and active, they are extremely popular and therefore well worth breeding. Moreover, once the fishes are large enough many species are ready spawners and the fry are not too difficult to raise.

With the larger Barbs, such as *Barbus everetti*, *B. filamentosus*, *B. lateristriga*, etc., males and females should be at least 3 in. long, though 4 in. is better. The sexes should be kept segregated until the females are full of eggs.

Such large fishes require plenty of room for spawning and, as it is quite possible that many hundreds of fry will hatch out, our normal breeding tank of 24×8×8 in. is too small. From experience I find that a tank roughly 30×12×12 in. is about right; this is thoroughly cleaned and 1½ in. of well-washed ⅛ in. grade sharp sand is spread over the bottom.

The tank is filled to capacity with seven-eighths clean rainwater and one-eighth fresh tapwater. It is then well carpeted with short Cryptocorynes, or young Indian Ferns (these should have good roots or many will be dislodged and float to the surface).

Two good clumps of *Myriophyllum* or *Cabomba* are put near the centre of the tank, but about one foot away from each other. Adjust the water temperature to 80-85 deg.F.

Because some of these large fish are very excitable it is best to place them in the breeding tank on a Saturday morning, as it is quite possible that the water change may stimulate them to spawn within half-an-hour, and the aquarist will need to be at hand to remove the pair immediately the spawning is over. Should the breeders get a fright and just sit in opposite corners, there is still a chance that next morning (Sunday) they will have settled down and plucked up enough courage to breed.

It is worth watching for a while, but do not sit too close or move violently enough to scare the fish. Once spawning has begun you need not be so careful as the pair then seem oblivious to everything else.

First the male begins to take an interest in his mate, and is likely to be ignored but, becoming more agitated, he begins to mouth her, and forces her out of the corner in which she is nestling. Soon he is driving her round

the tank, touching his body against hers as she swims. Then, as soon as she takes refuge in a corner again, he will bump her with his mouth to get her moving. If she refuses to be ousted he bites gently at her undersides and vent, often tipping her tail up until she swims off. Now he dashes after her and bumps his flanks against hers.

Soon the female will start to mouth him in return and, when swimming, will waggle her body alongside his. The activities of the pair increases as soon as spawning begins. They rush towards one of the feathery clumps of plants and press their flanks together, tremble and vibrate their bodies rapidly till, with a flip of their tails, they break apart. Dozens of small eggs may be seen falling on or near the plants but hardly have they passed from view when the pair return and repeat the egglaying process.

In an hour or less literally hundreds upon hundreds of eggs are laid. The pair buffet the plants in their frenzied dashes round the tank and short-rooted plants will often be uprooted and float to the surface, leaving little cover below; in fact, it is possible that the tank which looked so elegant a short while before may soon appear a shambles.

This does not matter provided the aquarist is watching and sees that the pair are still engrossed in spawning and paying no heed to the eggs but, once the spawning is over the excitement dies down, then the fish will turn their attention to eating the newly-laid eggs.

Immediately they start to grub about the sand they must be removed. This is most important. I have taken out the pair at the first opportunity and raised over 2,000 fry but, when leaving them for an hour longer, possibly only 10 to 15 eggs remain to hatch out.

This is because the parents take up big mouthfuls of sand, sift and swallow the eggs and then spit out the sand, only to grab another mouthful immediately. They appear as efficient at this task as any mechanical dredger!

Hatching of the Eggs

Once the parents have been taken out it is very often impossible to see a single egg in the much disturbed tank but they will hatch in 48-72 hours and then hundreds of tiny fry may be seen hanging on the sides of the aquarium, from plant leaves or rising and falling in attempts to get off the sand. They will require an abundant supply of Infusoria for the next few days, and copious amounts of Brine Shrimp after that, so before spawning these larger species make certain that the food position is adequate.

In a week or 10 days some Mikro-worms may be given, and a week later some fine dried food should be added to the menu, increasing the amount until it becomes the main item of the diet.

Breeding the Smaller Barbs

With the smaller species, such as *B. conchonius*, *B. nigrofasciatus*, Schuberti Barbs, *B. stoliczkanus*, *B. tetrazona*, *B. titteya* and *B. oligolepis*, etc., the standard 24×8×8 in. tank is satisfactory. It should be filled with seven-eighths rainwater and one-eighth tap-water and be planted as previously described. The water temperature should be 80-82 deg.F.

The parents are placed in this tank the evening before as spawning usually takes place early next morning in good light. Much the same actions take place as those described for the large fish, but the smaller Barbs are not so boisterous, and everything is more subdued. Since they do not disturb the plants so vigorously, eggs may be seen shining in the feathery clumps of plants.

If no eggs are seen the shape of the female is a sure indication of whether a spawning has taken place. She should be really plump before the egglaying and if she is slim after the pair have been together remove both fish at once as the spawning will have taken place. The eggs of the smaller Barbs hatch in 24 hours, so the fry should be seen hanging from plant leaves and stuck to the sides of the aquarium the morning after spawning.

Strangely enough these baby fish are quite as large, if not larger, than the babies of the bigger species, and will only require a little Infusoria. As soon as they are free-swimming, or two or three days after, the majority will take newly-hatched Brine Shrimps.

Of the smaller species the Nigger Barb is the easiest to spawn and raise. Be careful with *B. tetrazona*, the Tiger Barb, if spawning has not taken place next morning. Keep an eye on the female fish as the irate male may well damage her during the ensuing day. In any case, with all the Barbs, if spawning has not taken place within three days, do not wait longer, but try another pair.

Young Barbs grow quickly at first, then they seem to remain stationary for a while before shooting ahead once more. This seems general so do not blame yourself for this temporary halt in growth.

Lastly, keep an eye open for velvet disease, as young Barbs seem very prone to this parasite, but it can be quickly and easily cured.

Net the youngsters and place them in a bare tank, add a handful of cooking salt to every four gallons of water in the tank. Give aeration, if possible, and if the fishes are not completely cured in two or three days a little more salt should do the trick.

Recently arrived in Britain

Lovely Nothobranchius Tooth-carps

GERRY ROWE (*Tanganyika*) *tells how they live in the wild and why they make fine aquarium inmates*

FISHES of the Genus *Nothobranchius* have been comparatively little known to the aquarium world but I understand they have recently become available in Britain. I have been fortunate in living in Tanganyika, where they are common, and have had the opportunity of studying them at first hand. These fishes are worthy of some attention as they are among the most beautiful of small freshwater fishes.

Male Nothobranchius guentheri, *a species of tropical Tooth-carp that has been included in recent imports.*

The *Nothobranchius* are Cyprinodonts—Egglaying Tooth-carps—and, like *Cynolebias*, live only for one year during which time their whole life cycle is completed. This short life cycle has been brought about by the fact that they inhabit pools and streams which dry up completely for part of each year but, even when this does not happen, they will die on completion of their allotted life-span. As this is so, the aquarist who wishes to keep them must be prepared to breed a new generation each year, but for those who can do so the beauty of these fishes will repay them handsomely.

Numerous Variations

There are many colour varieties of *Nothobranchius* which are probably of comparatively few species. In the vicinity of Dar-es-Salaam, the capital town and main port of Tanganyika, there are at least ten differently coloured forms. At present, classification is somewhat confused but the work of revision is in hand.

In general, the males are brilliant in their coloration—one common species, for example, has a beautiful greenish-blue body, each scale of which is edged with red; the finnage is deep red. Others are similarly distinctive, and there is a species with a blood-red mouth, and another with bright yellow fins. The females are rather drab, of a grey colour and with spots of black on the rear part of the body; their fins are also shorter.

In the wild, *Nothobranchius* are found in seasonal pools and streams where the clarity is nil. Beds of most of these pools are clay which is also suspended in the water. The water becomes so opaque that a fish cannot be seen through more than an inch or so of it. The average pool would be some 20 ft. in diameter, and have a maximum depth of about two feet. As the pools dry up, the water becomes little more than very thin mud, but even then the fishes manage to survive until the last of the water vanishes.

In these waters there are rarely any other species of fishes but there are Water Scorpions, snails, often tadpoles and almost always small Water Boatmen which latter the *Nothobranchius* eat with great relish and which probably form an important item in their natural diet. Little plant life is present in these places, other than clumps of rushes in which the fishes seek shelter from the hot sun,

Male (left) and female Nothobranchius neumanni, *a species which is referred to on page 221 of this issue. Drawings of type specimens by courtesy of the British Museum (Natural History).*

although they can stand a wide temperature range.

When the water is plentiful and deep, temperatures are fairly low but, when only a few inches remains, temperatures go soaring and I have caught large numbers of fish in water only about two inches deep which felt almost hot to the hand. One day I recorded a water temperature of 84 deg.F. when the air temperature was 85 deg.F.

Nothobranchius also tolerate widely varying qualities of water. At the commencement of a rainy season, imagine fishes in a few inches of water. As the rains develop so the streams and pools build up very rapidly with a resultant equally rapid change of chemical composition and hardness of the water. Similarly, on cessation of the rains, the hot tropical sun makes short work of drying up these haunts with an increase in dissolved solid content, and variations in other characteristics.

That the fish can live in very foul conditions is shown by the fact that I have caught healthy specimens in the shallow, warm water referred to above which was also very badly fouled by the excreta of cattle that used the pool.

In such ponds as these very large numbers of *Nothobranchius* are often found. In the pond which I normally visit, at each sweep of a net (some 18 in. across) five or six fishes can be caught. In stream beds, this is not the case. Here, numerous small pools are left behind as the waters subside, each holding a few fishes. In one such pool, not more than six square feet in area and only two inches deep, we have taken over 20 specimens, all perfectly healthy except for torn fins.

The large species range up to about 4 in. overall maximum size but others reach only 1½ in. or so. A strange thing, which is often noticed in the larger ponds, is that the males and females are clearly separated, often being found at opposite sides of the pond. It is possible that the females avoid the attentions of the males who are extremely ardent.

Promiscuous Spawners

Even as soon as the fishes are caught, they will court and sometimes spawn in the carrying jars and continue immediately when placed in a tank. After prolonged spawning it has been noticed that these fishes become very emaciated and die; life is prolonged by keeping the sexes separate.

In the aquarium, *Nothobranchius* are not especially easy to keep but given the right conditions they will live well over six months. Old water is definitely preferred, and it sometimes helps to add a very little salt. The natural waters are not brackish and heavy additions of salt are neither necessary nor desirable. It is recommended that *Nothobranchius* be kept on their own for a few days prior to placing them with other fishes. As with most species, they will eat anything small enough to enter their rather large mouths—including other fishes. During these few days they will become used to aquarium food; livefood is decidedly to be preferred but they will take wheat-germ dried food readily and will eat most other foods. On later introduction to other fishes, they are then normally peaceful.

When first obtaining any specimens, it may be seen that their fins are frayed as *Nothobranchius* do not always travel well. The addition of a small quantity of acriflavine (about 1 mg. powder to 10 gallons water) to the travelling water helps, and this treatment may be applied, if required, in the aquarium.

Fighting Males

The males of some species fight extremely fiercely and can severely damage fins. The remedy is to provide plenty of plant cover, or to keep several males together when the aggressor will find so many opponents that, although a little sparring may take place, no serious harm is likely to result.

On wild-caught specimens, the gills may become swollen and inflamed and I would suggest that the fishes should not be overcrowded during this introductory period and that aeration be employed until they settle down.

In the aquarium, *Nothobranchius* quickly become tame and will take food from the hand. They may even be lifted right out of the water in the hand. As the life span draws to a close, very obvious senile decay sets in.

There remains but the problem of replenishing stocks, and the consideration of the breeding habits of *Nothobranchius*. As I have explained, the waters in which these fishes live dry up completely for part of the year. This period may be up to six months or even longer. To ensure the continuation of the species, two kinds of eggs are laid simultaneously; one lot hatches immediately, whilst the others drop into the mud where they remain. The mud dries out and the eggs hatch in the next period of rain; a light dampening by a shower does no harm and the eggs will hatch only after heavy rain has refilled the pool.

Hatching then takes place quickly, and it has been seen in the aquarium that some specimens grow rapidly to reach maturity in a time which may be as short as 14 days, whilst others may take months. Presumably this is Nature's provision against the pool drying up before a new lot of eggs are laid. This I have also seen in Nature where a few very large specimens can be caught only three or four weeks after water has reappeared.

During the dry season, the mud becomes rock-hard and some of this can be placed in an aquarium and covered with water when any eggs present will hatch after four weeks or so. In the United States, it has been recorded that eggs have hatched after a period of from 216 to 252 days and one egg was still alive after 300 days.*

Breeding is not difficult to bring about as *Nothobranchius* will spawn continuously throughout their life. The aquarium should have shallow, old water and should receive no direct sunlight. A few plants may be added, and the bottom of the tank covered by a layer of marl or mud, or even sand. The male and female will lie close together on the aquarium floor, the male holding the female tightly by wrapping his long dorsal fin over her back. With a violent trembling the eggs are laid and drop into the bottom covering.

The spawning is easily achieved but the hatching and rearing of the fry is not quite so simple. Some eggs may hatch after a time, but it is suggested that better results may be obtained by allowing the water to evaporate completely. Then, after a period of complete dryness, slowly add water over a period of several days when the drought-resistant eggs should hatch after four weeks or more depending on temperature.

Whilst in a dry state the eggs should not be allowed to become chilled—in the full sun of the Tropics the enclosing mud must have a temperature from about 75-85 deg.F. During hatching, temperatures may be held at around 75 deg. as it is thought that higher temperatures have a delaying effect on the development of the eggs.

Once hatched the fry may be treated as other species. If success can be achieved in this, the aquarist will have an addition for his collection which, for colour and interest, will be hard to match.

*Information supplied by Mr. W. White, B.S., Pennsylvania, U.S.A.

Automatic Fish Feeder

Daily supply of food given by a mechanical device

by A. ALDAYA

MR. ARTHUR BUTTON, of Corby (Northants), has solved the problem of feeding his fish while away from home.

Mr. Button, who works in the instrument section of a local steelworks has made an automatic fish feeder. He thought up the idea shortly before going on holiday recently and experimented with one or two gadgets before coming up with the final design.

Shaped like a water wheel, with a back and front, the feeder is broken into segments which can be filled with as much or as little food as is required. The wheel is turned slowly by a Government-surplus 'clock' that turns one full revolution every seven days.

As it revolves it spills out each day's ration of food through a small hole at one end of each segment.

Mr. A. Button holding the automatic feeding device by which his fish received food whilst he was on holiday. Dried food was tipped into the aquarium at daily intervals over a period of a week, the wheel rotating slowly to make this possible.

"I only just finished the gadget before going on holiday", says Mr. Button, "and I had not time to test it. When I came back from my holiday all the segments were empty and the fish (coldwater, including two Goldfish) were swimming about quite happily".

Cryptocoryne affinis

A tropical aquarium plant generally known under a different name

by Dr. H. C. D. de WIT

Cryptocoryne affinis. "a" *shows a flowering plant* (× ½); "b" *is the upper part of the flower just before opening* (× ¾) *and* "c" *shows the opened* "hail" *or* "kettle" *of the flower* (× 1½).

AMONG post-war novelties, *Cryptocoryne hartteliana* Jacobs. ex. Milk. proved to be a most successful aquarium plant. But first of all we should ascertain its correct name. Mr. H. Haertel (Dresden) imported an unnamed species of *Cryptocoryne* just before the outbreak of the second world war. The plants were grown at Kiel and Mr. Jacobsen, a superintendent of the botanical garden there, being unable to discover the scientific name, used to refer to them as *C. hartteliana*.

In 1949 Mr. Milkuhn published (*Wochenschrift*, 43, p. 288) the name and described the species in accordance with the International Rules of Botanical Nomenclature. So *C. hartteliana* Jacobs. ex. Milk. became established. Nobody had seen it in flower and so Mr. Milkuhn had to be satisfied by describing the leaf.

When I saw plants for the first time I adopted the view that *C. hartteliana* had not been previously described under another name (*Het Aquarium*, 24, 1953, No. 2). I was led into this error as I received very large and luxuriant specimens and I had no experience of its variability at that time. Actually, the correct title is *Cryptocoryne affinis* N. E. Brown ex. Hook. f., a name dating from 1893.

C. affinis is one of our very best aquarium plants. It grows exceedingly well (but only submerged) so long as a moderate amount of artificial light is available. Daylight is not well tolerated in our latitude and, in greenhouses, the plants ought to be kept in deep shade.

It is an unexplained fact that *C. affinis* has not been seen in flower—as far as I know—in the last four years.* They are grown in thousands and for some reason they remain sterile. One might try to discover the cause by experimenting with different amounts of light and alternating periods of darkness and light.

If it flowers, however, the species is most charming. The inflorescence may reach a length of more than 30 cm. (12 in.) and the upper part shows a spiralling triangular ridge (see the diagram). Finally this ridge splits along the rim and, through a narrow gap, the velvety, glowing black-purple inner surface of the twisted but erect limb becomes visible.

C. affinis has oblong, dark velvety green leaves, which are very easily distinguishable by the clearly marked greenish-white nerves on the surface. The blade is usually more or less regularly bullate. Depending on the amount of light, the lower surface of the leaf-blade may turn deep wine-red.

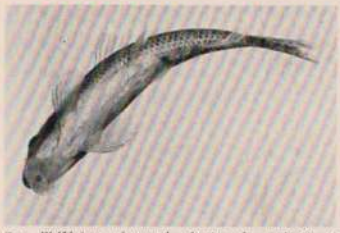
In the course of time *C. affinis* forms a dense "bush" in the aquarium, its height ranging between 8 and 35 cm. (3-14 in.). It increases rather quickly.

*In 1955 (August-September, 1955, issue of WATER LIFE, p. 191) Frank Arnold, Forest Gate, London, E.7, reported the flowering of "*C. hartteliana*" in his tanks. —ED.

Tropicals that Attract Attention

A selection of fishes from current importations

by F. MILLET



Gene Wolfsheimer photograph showing the underside of the so-called Siamese sucker fish, Gyrinocheilus aymonieri.

DURING the last twelve months British aquarists have been extremely fortunate in that so many new fish have been on offer to them. New fish have appeared in traders' tanks so regularly that the unthinking aquarist is apt to be rather hurt when he visits his favourite aquarium shop and finds nothing new on offer.

Readers of my articles will have seen that most of the recent "new" fishes have come from Siam and West Africa; parts of the world that, hitherto, have not been fully exploited from the aquarist's point of view. For the time being it would appear that the collectors in these countries are concentrating on sending further consignments of recently introduced fish that have proved popular, such as the Siamese sucker fish *Gyrinocheilus aymonieri*. In doing this they are acting wisely from two points of view. They know they will find a ready market in Europe for their fishes, and aquarists like to be able to replace, or add to, fishes that they may have lost for one reason or another.

The continual exploitation of new species that are on the market for merely a week or two, and are never replaced, is not very good from either the aquarist's or trader's outlook, though naturally some new species are needed and are always welcome in order to keep our hobby in a virile state.

Considering the difficulty of importing certain unusual fish it is surprising how well the aquarist in this country is served by the importers and, although I have seen no fish entirely new to the aquarium world recently, there are many that are so little known to the average aquarist that they are well worth mentioning and, it may be added, keeping!

One of these species is *Barbus ariulus*. Though known to science for over a century, it has only reached the aquarist fairly recently. In suitable surroundings it may reach six inches in length though the average aquarium specimens are much smaller. It is an attractive fish of typical Barb shape. It has a silvery underside with the olive sides and back marked with black bars and patches. There are red patches on the anal, caudal and dorsal fins of specimens in tip-top condition.

Development of the Dorsal

The adult males can be distinguished by the fact that the rays of the dorsal fin project beyond the fin like those of *B. filamentosus*. This secondary sexual characteristic appears between the age of one year and 18 months.

The species has been bred and should offer no difficulty to the aquarist who has experience with breeding Barbs. Its original place of discovery was Travancore in India. *B. ariulus*

The unusual Half-beak, Dermogenys pusillus.

are said to enjoy a fair amount of vegetable matter in their diet and, unless this is provided, they may eat the softer plants in the aquarium. Needless to say, breeders should be removed from the tank as soon as spawning is completed.

A fish that appears fairly regularly, but is never in plentiful supply, is currently on offer in London. This is the Half-beak *Dermogenys pusillus*. Although this fish has a reputation for being difficult to keep, it is well worth the attempt. Whilst not beautiful it is attractive in its way. It has a silvery belly, an olive green back, and reddish fins. The prolonged lower jaw that gives it its English name distinguishes it from any other aquarium fish.

Half-beaks are livebearers, but are not easy to breed though, if their needs are understood, there is much more chance of success. They should be given temperatures around 78 deg.F., and shallow, brackish water is essential. If sea-water cannot be added they must have a tablespoonful of salt to each gallon.

The males reach a length of about 1¼ in., though the females can attain 3½ in. They will only eat livefood near the surface of the water so *Daphnia*, mosquito larvæ and Glass Worms are obviously better food than *Tubifex* or White Worms. The adults must be separated from the young. True albinos with pink eyes are offered from time to time, and are worth acquiring though probably they are weaker than the normal fish.

It may come as a surprise to some readers to

Orange Chromide, one of the smaller Cichlid species, although not a dwarf. Its adult size is in the range of 3 in. New York Aquarium picture.

know that these fish have been used in Siam for many years as fighting fish, and that fortunes have been won, and lost, wagering on the results of such wrestling contests for, unlike the true fighting fish, these fish "wrestle" and do no bodily damage to each other. The males grasp each other by the jaw and twist and turn until one fish retires from the combat.

They are carefully bred for this purpose, and kept separate in pottery jars, for in glass containers they are apt to damage the projecting "beak". Such fish, that have been bred for their fighting qualities for many generations, are more pugnacious than their wild cousins, and a good wrestler will continue for an hour when a wild fish will give up in a matter of minutes. Bad fighters are discarded for breeding purposes.

A well-known Siamese breeder of these fishes, once his country's ambassador to the U.S.A. and Great Britain, stated that in certain conditions virgin females could produce young. This has not yet been observed scientifically, so yet another problem is set to the serious aquarist. Can this happen? If so, in what circumstances?

Chocolate Gouramies

Another fish on sale in London is the famed, and difficult Chocolate Gourami, *Sphaerichthys osphromenoides*. This handsome chocolate and gold fish has brought despair to some of the world's most experienced aquarists, yet others have probed its secrets and have bred it successfully.

As mentioned in the October, 1957, issue, there still appears to be some doubt as to whether it is a bubble-nest breeder or a mouth-breeder, or whether there are two similar species breeding in two ways! A rich prize, however, should await the first British aquarist who breeds and rears the fish in commercial quantities.

It is found in Malaya and Sumatra, and is very fussy about water quality and temperature. It likes it as warm as 90 deg.F., and must have very acid water such as that from a well-established tank with a peat subsoil.

An unusual Pencil Fish seen in the Midlands is *Nannostomus beckfordi*. While reminiscent of *N. anomalus*, this fish is fairly distinctive, and has pretty red patches on its dorsal, anal and caudal fins, and a dark stripe with an upper bright streak running from head to tail. It should breed in a similar manner to *N. anomalus* if given soft acid water at around 80 deg.F., with suitable spawning plants.

As with most fish, the parents should be removed after spawning, and the eggs and young fry shaded for a few days.

An old favourite that is rarely seen nowadays is the Orange Chromide (*Etroplus maculatus*). Its home is an unusual one for a Cichlid, for it comes from India. Reaching a length of 3 in. this fish can be bred, but not as easily as some of its family. It likes a fairly high temperature around 80 deg.F. for breeding and will tolerate a fair amount of salt in the water.

Accounts of its breeding vary considerably. Some authorities say that it lays its eggs in

flower pots, or under stones, others say that it will deposit them on plants, and yet others state that it digs a depression in the gravel and lays its eggs in this.

We can assume, therefore, that this fish has catholic tastes and will adapt itself to its surroundings. It is not, perhaps, so pugnacious as some Cichlids, and has been known to spawn in a community tank. It is a handsome fish and well worth keeping.

Other, not so common, fish seen recently include the Dawn Tetra, *Hyphessobrycon eos*, and true *Barbus hexazona*, a "Tiger Barb" which has six vertical bars instead of five. The male can be distinguished by its red anal fin. This Sumatran fish can be bred in the normal Barb way, but is not so easy as some.

Occasionally fish importations include plants of special merit. One of our leading plant growers has received a consignment of plants from Ceylon which includes a very beautiful newcomer, *Lagenandria lancifolia*. This plant, which is an aroid, has dark green spear-shaped leaves with a silver edge. As far as I am aware this is the only tropical aquarium plant with a variegated leaf, so for that reason alone it is worthy of cultivation. Like the larger *Echinodorus* species, *Anubias* and some Cryptocorynes, it does better if it has a little peaty soil around its roots.

BUENOS AIRES TETRAS

A pugnacious disposition limits these colourful fish for aquarium use

G. J. M. Timmerman photograph of Buenos Aires Tetras (Hemigrammus caudovittatus).

WITH most of tropical aquarium Characins we associate a size of 1½-2 in. but, in the case of our cover fish, the Buenos Aires Tetra (*Hemigrammus caudovittatus*), the maximum length is 3½-4 in. Matching this larger size is a more aggressive nature and Buenos Aires Tetras are frequently guilty of fin-nipping so are not the best of community fishes, especially with species smaller than themselves.

Attacks in the Breeding Tank

The female *H. caudovittatus* carries this worrying trait a stage further and, when in breeding condition, will attack males of her own species. For this reason the two sexes should only be put together actually for a breeding attempt.

The breeding aquarium should be no less than two feet long and well set with fine-leafed plants on which most of the adhesive eggs stick and among which the male parent can hide when its mate becomes too boisterous. Even so the male is sometimes killed.

Immediately spawning has finished the parents are removed. The eggs hatch in two to three days and the young are not difficult to rear.

The general body colour of the fish is silver and a black diamond-shaped mark is present on the tail-fin base. This dark mark runs into the fin itself. Fins, especially the dorsal, caudal and anal, are red or orange. An adipose is present. Females are generally slightly larger than the males and are fuller bodied.

Wide Temperature Range

The species has a wide temperature range and thrives at 65-85 deg.F. From 72-75 deg.F. is recommended for breeding. Buenos Aires Tetras are ready feeders and enjoy all the usual livefoods and some vegetable material.

As their name suggests, they come from the Buenos Aires area of Argentina.

From My Experience . . .

by R. W. ANDREWS

I ALMOST always have a few Siamese Fighting Fish (*Betta splendens*) in my aquaria. This species has an appeal for me, not only because of the male's fine finnage and beautiful coloration, but mostly because of the high degree of individualism which both sexes appear to possess.

This outstanding characteristic shows itself in many forms and seems to develop very early in the Fighter's life. Just one instance I will recollect concerns a most interesting incident, which I chanced to observe in a tank containing a number of young, half-inch-long Fighters.

Two of these fish were facing each other in the centre of the tank with every suggestion of immediate aggression; their finnage was stiffly erect and their gill covers fully raised. Encircling the two would-be antagonists completely was a ring of every remaining *Betta* in the tank. All these fishes had their heads facing inwards, obviously waiting for the fight to commence!

This unusual tableau was retained for over a minute, when suddenly one antagonist made a forward pass at its opponent, who retreated and, when pursued, swam wildly away. At this, the whole circle of spectators scattered madly about the tank.

I have bred and reared many Bettas and one thing I have constantly noticed is that, during the early stages of development, a certain number will grow twice as quickly as the others. If these better-developed specimens are farmed out to other tanks, another group will almost immediately start showing more advanced growth than their companions. If these are transferred as well, then yet another batch will shoot ahead. This situation will continue until only the true runts remain.

Precautions with Worms

Tubifex worm feeding has long been a controversial subject in aquarists' circles. Personally, I have always used this type of livefood, but I take care to follow two golden rules in my worm feeding routine. I commence by placing a workable lump of *Tubifex* on to a four-inch square of plate glass; then, with tweezers, I pull apart and spread the worms over the glass.

Now comes the first rule, that of picking out any of the worms which appear all black in colour. Experience has proved this type to be extremely active and wiry in body; also it is usually of an extra length to the normal red *Tubifex*. My record black specimen, when extended, measured 4¼ in.

Chopping Operation

It can be well imagined what damage such a single worm could do to the gills of quite a sizeable fish. After removing the undesirable black worms, the second rule is applied by chopping the remaining worms with a razor blade to the appropriate size for the fish to be fed. Incidentally a further reason for removing the black worms is their ability to avoid chopping by coiling themselves up into a tight, wiry ball.

The procedure described here may seem to involve a lot of trouble but actually the whole operation can be swiftly accomplished with a little practice. Perhaps I should add that, fortunately, the majority of *Tubifex* purchases contain very few of the unwanted worms but just one black specimen could cause the mysterious loss of a valued fish.

Knowing Tooth-carps

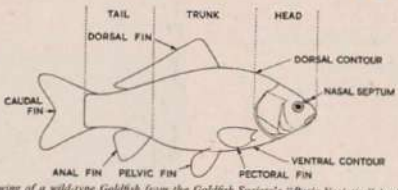
Rivulus species do not appear to find much favour among aquarists in general but I, personally, have found that these fish possess many interesting points, not the least of which is that no special set-up is needed for spawning them. The medium-sized eggs are deposited conveniently on to surface plants, thus being ideal for transfer or collection.

Rivulus are inclined to be predatory by nature yet some of the species, in particular *R. urophthalmus* and *R. hartii*, can show a marked friendly disposition towards their owner!

Even Stroking Allowed

This typifies itself when the fish is indulging in the apparent pleasure of resting on a surface plant, with its back above the water level, basking in the rays from natural sunlight or even artificial electric lighting. At such times it is often possible to lightly stroke the fish's back without causing any display of fright.

EXTERNAL FEATURES OF GOLDFISH



Drawing of a wild-type Goldfish from the Goldfish Society's "Basic Varieties" booklet.

Development from wild-type fish

by R. J. AFFLECK, M.Sc.

IN the rivers of China there occur fish with a dull, olive colour known to zoologists as *Carassius auratus*. These are the wild-type Goldfish. Many years ago some Chinese noted specimens which were different in colour from the normal fish. These specimens were segregated and, as the new character was one which could be inherited, the Chinese were able to build up a strain of fish which differed from their wild-type relatives and thus, over a number of years, large numbers of Goldfish were produced. As time passed, further freaks arose which, in turn, were segregated and eventually gave rise to other varieties.

Sex tubercles present on the gill covers of a mature male Goldfish. Photograph, L. E. Perkins.

While, to the layman, a Goldfish is just a pretty fish, a fancier will surely consider all the varieties as one of man's triumphs, for from an inconspicuous fish he has nursed and guided its evolution for more than a thousand years. The Chinese have a reputation for being perseverant, artistic and lovers of what appears to the Westerner as grotesque or bizarre. We must expect, therefore, to find that some varieties are fascinating rather than lovable.

Wild-type Fish

A wild-type fish, four inches long, is shown in the upper illustration. It will be noted that, although the body is relatively streamlined, there are regions where the contours are comparatively straight, particularly on the underside. In a river the amount of food available is limited and, as a result, most wild fish tend to be "thin".

When a wild fish is placed in a pond or large aquarium and given more than sufficient food it will eventually become plump and resemble its domesticated cousins seen at exhibitions.

The mouth is terminal in position and protrusible. This arrangement enables the fish to seize comparatively large portions of sand and mud as it grubs about the bottom in search of food. After food particles have been sorted the unwanted material is spat out.

Above the mouth are a pair of nostrils.

Externally each one consists of two openings separated by a septum but internally each hole is divided into a number of compartments.

In the wild fish the eyes only project very slightly and do not spoil the general streamlined form. Eyelids are absent so that the fish must sleep with its eyes open. The iris and eyeball contain reflecting tissue and therefore appear shiny.

The shiny gill cover, or operculum, is supported by four transparent bones which have a backing of reflecting tissue. Its outer margin has a thin flexible edge which forms a watertight joint when the operculum is closed.

Disposition of Scales

The trunk and tail regions appear to be covered with scales while the head appears naked. In reality the scales are situated beneath the outer layers of the skin and are only visible because of the transparency of the outer tissues.

The sketch shows the shape of a four-inch fish but this alters with age. A young fish is comparatively slim but as the fish becomes older the relative depth of the body increases.

Fins consist of thin transparent tissues supported by bony rays. Each ray consists of a number of small bones placed end to end and decreasing in section as the extremity is approached. Many of the rays are branched. In all fins each ray is a double structure with the two parts lying side by side.

Muscles are attached to the fins and, by contraction, are able to move them. The main movements of the dorsal and anal fins are confined to erecting and closing them down against the body but with the pectoral, caudal and, to a lesser extent the pelvic, fins considerable flexibility of movement is exhibited.

At the vent there are three small openings; the first is the anus or end of the digestive tract; the second is the opening from the reproductive organs and is visible only during the breeding season; while the third opening is from the kidneys.

Sexing Goldfish

The sex of a Goldfish may be determined comparatively easily in the breeding seasons when, in the males, very small white pimples called tubercles develop on the front edge of the pectoral fins and on the opercula.

Tubercles have been known to occur on females but their occurence is extremely rare. At this season females become swollen with eggs. Out of the breeding season the male may be recognised by the first ray of the pectoral fin which, in adult fish, is noticeably thicker than that of a female.

★★★★★★★★★★★★★★

Fish Philately

★★★★★★★★★★★★★★

Paper Nautilus

THIS 15-dinar stamp, printed in royal blue with white lettering on a black label at the foot, is another of the lovely set issued by the Yugoslav government in 1956 to illustrate the varied marine fauna to be found off the Adriatic shores of the country.

The stamp depicts a cephalopod, the benign species of Octopus known as the Paper Nautilus (*Argonauta argo*). Only the female of the species has the brilliant, paper-thin shell from which the popular name derives.

It was once believed that this Nautilus, in common with certain *Crustacea*, assumed the abandoned shell of some other marine creature. The elegant and moderately elastic shell is now known to be its own work.

On calm, clear days, the female Nautilus comes to the surface and floats along on its shell like a small ship. Normally, it dwells on the sea-bed, propelling itself along in a deceptively slow and languid fashion.

When necessary, however, it is capable of great speed, produced by a form of jet propulsion as it expels water backward through a wide siphuncle—plainly visible on the stamp—as other octopuses do.

A wealth of pigmented cells in the skin of the Paper Nautilus enables it to adapt its body colour to changes in environment.

JOHN WAKEFIELD

★★★★★★★★★★★★★★

Do it yourself

Aquarium behind a facia

by H. R. R. ODAM

ORIGINALLY I made the shelf and drawers illustrated as a stand for a 30 in. × 15 in. × 12 in. aquarium which was completely boxed in but recently I have changed the tank for the 30 × 12 × 18 in. one shown in the photograph.

Although I wanted to build a surround for the aquarium, builders were expected to repair a large crack in the wall behind, so a permanent cabinet was out of the question. After a lot of thought the set-up shown was made. It took one Saturday to construct and anybody could make a similar facia using only a saw, screwdriver and rule.

With 1 in. × 1 in. quartering I built a close-fitting frame, 30 in. high, to slip over the tank from the top. From the frame to the left-hand wall a panel was made taking lighting, aerating and table lamp socket switches. Across the top there is another panel with a 12-in. flap hinged to it. On the right-hand wall there is a 12 in. × 32 in. panel, having a door and fixed to the wall with a piano hinge.

Light Supports

A crosspiece of 1 in. × 1 in. wood supports three lights—40-watts each. Over the bulbous part of each lamp I have fitted car headlamp reflectors. The top of the facia is open, and light from the stem part of the lamps shines up the wall. This illuminates the picture which is a needle painting of a garden and attracts a lot of attention illuminated in this way.

Behind the door on the right is the mains socket and aerator and all the books and papers I wish to keep handy.

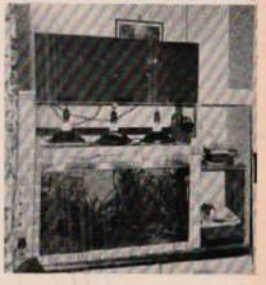
The tank is covered with glass in the usual way and, by lifting the flap of the facia, I have plenty of room to service the tank.

Another strip of wood across the frame makes a stand for the house-plants. The whole set-up, with the exception of the tank, can be removed and replaced as it is only held by pieces of wood forced in between the wall and the frame.

Facing Materials

The panels are of hardboard and the brick-work is of self-adhesive plastic which can be stripped and replaced without damage, if required.

Above: the facia aquarium described by Mr. Odam. Below: The top flap lifted for servicing.



A PLAN FOR BREEDING QUALITY GUPPIES

The author standing beside one of his Veiltail Guppy exhibits which took a special and first prize at an annual Guppy show held in London.

No expensive set-up needed but start with good quality fishes

by W. G. PHILLIPS

STROLLING around the Guppy Federation's annual show at the London Zoological Gardens I overheard a visitor say to his friend, "If I could produce Guppies like some of these I would take up breeding Guppies, instead of the fish I keep now". Certainly to breed a reasonable quantity of good Guppies is a challenge even though the aquarist may have achieved some success with other varieties of tropical fish.

The choice of the Guppy variety matters little. What is important is the quality of the fish you start with and then not so much the fish themselves but the stock they were bred from. Show-type Guppies have been developed by man from mutations and from the cross-breeding of different strains. If careful selection is not practised then the resultant crosses are likely to produce undesirable types.

Young male Guppies, unlike many egg-laying fishes, are not living replicas of their parents. They have to be at least four to five months old to become that and the number of quality fish at this age can be very disappointing until the desired characteristics become more or less fixed by judicious in-breeding.

For many years I have had a lot of pleasure out of breeding and trying to improve a different variety of Guppy each year; the rarer the variety the better I have liked it and whatever success I may have had has been achieved by the procedure I shall describe here.

Paul Hahnel, the well-known American Guppy breeder, when he paid me a visit, said he attributed most of the success he had with his Guppies to their feeding and their environment. How true that is. If the temperature is too low and the water is not right the fish will not eat, and if they do not eat they naturally do not grow. Guppies, strange as it may seem, are rather fussy regarding water. Being river fish, they like clean, oxygenated water.

Minimum of Three Tanks

Three tanks are the minimum required to concentrate on one variety; four are better. Guppies do not need large tanks; two 18 × 9 × 9 in. and one 36 × 9 × 9 in. (which can be divided if and when necessary) do nicely with one 40-watt heater in each of the small tanks and two 40-watt heaters (one at either end) in the larger one. A thermostat controls the temperature and cuts out at about 77 deg. F.

A thermometer is also necessary and one in each tank is desirable. Aeration is appreciated by most fish but is not essential unless the fish are crowded. The back, bottom and ends of each tank are painted on the outside. All tanks are, of course, fitted with cover glasses.

It is most important that an attempt is made to save every youngster born and this is not possible if plants are relied upon to provide cover for the very young fry. I use a breeding trap made by sticking a rubber sucker centrally on one end of the small tanks about 2 in. up from the bottom. A square piece of glass, the width of the tank, is placed so that it rests on the knob of this sucker. The glass rests at an angle of approximately 45 deg. with another sucker to support it on the front and back of the aquarium (this arrangement was shown on page 19 of the November, 1957, issue).

After the aquarium has been filled for several hours the pair of fish you intend to breed from are placed in the larger portion of the tank, which should be clean and bare of sand.

Any plants that are used in the breeding tank should be grown in pots and be free from snails or their eggs. The reason for using plants in pots is that they are easily removed when it is necessary to net the fry. Snails should be excluded as they have an unfortunate habit of finding their way up into the trap and can then stop the new-born fry from dropping through the bottom out of reach of the female parent.

Removal of the Male

About the twenty-sixth day (no later) after the fishes have been put in the tank the male should be removed and placed in the other small aquarium. The female is then transferred to the trap. This is best done towards evening. Add a few *Daphnia*, cover the top of the trap and await results.

The young should be delivered in 28-30 days after fertilization. Where a fish has not been mated previously fertilization does not always occur as soon as the pair are put together and then sometimes you have to wait several days longer than the time quoted before the youngsters are born. There is no need to be concerned if this should happen, however, as females have lived in this kind of trap for nearly two months without any apparent ill-effect.

When the fish are born they drop through the gap formed by the thickness of the bottom sucker and are thus out of the reach of the female fish.

Day after the Young are Born

The day following the birth of the fry, and not before, the female is removed to join her mate. The square of glass and the side suckers, forming the trap, are then taken out.

For the next week or 10 days the fry are fed several times a day on newly-hatched Brine Shrimps and from then on with screened *Daphnia* and a little fine dried food.

When the youngsters are three weeks old the plants in pots are removed and every single fry is netted, a few at a time. If the female was at the least four months old when mated there may be anything from 60 to 90 or more baby fish. They should be placed in large, square jars or other containers and fish that are definitely males are transferred to the large tank to grow on. The parent male now goes in with them and the parent female is disposed of to avoid cluttering up tank space with unwanted youngsters.

All definite females can be transferred to the now vacated, second small tank. The remainder, the doubtfuls, go back to the tank where they were born.

In all probability you will only be able to pick out very few males so each week go through the same procedure as it is here that all your work can be ruined by overlooking a poor quality male. The late maturing males are the borderline type and have footed many

Male Flagtail Guppies, a variety which originated in America but which Mr. W. G. Phillips has developed. Fishkeeping *photographs.*

until it was too late to do anything about it.

Having sexed the young and got all the males in the larger tank (which, by the way, can be planted but only along the back and across both ends, leaving as much space as possible clear of sand and plants), from now on dispose of any slow-growing or deformed fish.

Your space is limited and you do not want more females than males. In any case only the very best are used for future breeding and you cannot and should not attempt to make the final choice until the fish are at least four months old.

You may or may not have quite a number of good quality fish, much depends on how their forebears were bred. If you have a young male better than the parent male mate him to the two best females in one of the small tanks, after you have again fixed up a trap in each, and follow the procedure previously directed. If, however, your parent male is better then use him with two of his female offspring.

Now the number of times you can continue in-breeding depends on the results you achieve. If you notice you are losing size or vitality then bring in another female, of the same strain but from a different source, or obtain a different male. Various other animals have been inbred, brother to sister, for very considerable periods but for the amateur handling small fish that is rarely possible.

Whilst the selection of the right males is nearly always easy from the characteristics they exhibit, there is little to denote in the female what characteristics she is carrying. There are, however, a few points the breeder can watch for, depending on the variety or strain. For instance, the female of all Sword-tails or Lyretails should have plain (clear) fins.

Females of the Cofertail variety show a semblance of colour in the dorsal and caudal fins. Likewise, the females of fish with fully developed tails (such as the Scarf-, Veil-, and Flagtails) have colour, or at least a semblance of colour, in their fins. The latter three types have different shaped dorsal and caudal fins, the tail fins being much more square cut than in other female Guppies.

These points are important and only females with the specific characteristics should be chosen for future breeding. At no time should any but strong, healthy fish be bred from, no matter how good they are in all other respects.

Gadget for Removing Pests

by W. A. BONE

THE gadget illustrated was designed and made in sheer desperation after numerous pests had developed in a breeding aquarium. It is useful for removing planarians, *Hydra*, snails and snails' eggs, or indeed anything that adheres to a flat surface in the aquarium.

It is made of metal and this is necessary because the working edge must be razor sharp and flat. First a piece of ¾ in. tubing about 1½ in. long is cut in half.

The front edge is bevelled from the inside and a large hole is made in the base of the half-circle. Over this hole a piece of gauze is soldered on the outside, covering the hole completely, and the end pieces are soldered on, making sure the sharp edge stands proud of the ends. The mesh of the gauze must be small enough to prevent the pest from getting through.

The handle is of stiff wire and made to the required length. I suggest ⅛ in. wire is used for this purpose. After the handle has been bent into shape it is soldered to the back of half-circle on the outside.

a=side view. b=underside view with the gauze soldered in position. c=sectional side view showing razor-sharp edge.

The gadget is used by placing it underneath the pest and against the glass. The scoop is then drawn slowly upwards and the unwanted animals are contained in it.

Leeches and the like will cling to the apparatus but, if there is a basin of very hot water handy, shake the scoop in it.

Green Shore Crab.

Marine Aquarium Keeping

CRABS IN A SEAWATER DISPLAY

by J. S. VINDEN

RELATED to the Hermit Crabs, discussed in January, and good marine aquarium animals, are the little Porcelain Crabs of the *Porcellana* Genus. They are nearer to the Hermits than to the true crabs, have small bodies and large claws, and spend much of their time clinging to rocks and shells with their legs.

There are several species, the most common of which is perhaps the Broad Claw, *Porcellana platycheles*, and on rocky coasts this can be found under stones between the tide marks. It is covered with hairs that get matted with mud and other materials which serve to disguise the animal, so it is frequently overlooked. The undersurface of these crabs is smooth and white like porcelain, and it is from this peculiarity that they take their common name.

Care must be taken in collecting these animals, for they cling so tightly to the rocks that there is a danger of their parting with their legs if picked up too roughly. They are mainly filter feeders and should be provided with very fine food. There are other members of this Genus but they are mostly small and inconspicuous.

Easiest Crab of all

In true crabs the abdomen is small and is tucked forward under the thorax. It cannot be seen at all if the animal is observed from above. The commonest of the true crabs, and the easiest for the beginner, is the Green Shore Crab (*Carcinus mænas*). It is lively in a tank and will eat very nearly any dead animal material.

It is suggested by W. B. Johnson that since this crab scatters particles of food around, it might be advisable to feed it in a separate container and to rinse it under the tap before returning it to the aquarium. Like all the crustaceans the Green Shore Crab moults periodically and, unless some safe retreats are provided, the soft shelled crab will be attacked and eaten by its fellows.

All crabs in the same tank should be of an even size and, moreover, not too many should be kept unless there is plenty of space. They climb rockwork easily, so the tank must be covered to prevent their escaping. Provision should be made for them to leave the water should they so wish. They become rather tame and will learn to feed in one spot.

Small Mussels

Very small mussels up to ¼in. long may be gathered on the shore and put in the tank with the crabs. When hungry the crabs will open a small mussel in a clever fashion and help themselves to the contents. This method of feeding prevents the risk of polluting the water with carrion.

Like Hermit Crabs, they steal food from anemones if they are hungry. They are rather destructive creatures in a tank and can move quite heavy objects such as oysters from spot to spot. They may also demolish carefully built piles of rockwork unless these are fairly substantial.

If a crab goes off its food it may mean that it is about to moult, for they are inclined to fast for some days before casting their "shell". Should there be a risk of a newly-moulted specimen being injured it is best to remove the fasting crab to a separate container before the moult takes place, as freshly-moulted crustaceans of any sort should not be

handled. In cold weather shore crabs are inclined to bury themselves in the sand and feed little.

Spider crabs make good aquarium animals. The most frequently found of these is the Common Spider Crab (*Hyas araneus*). It has a small body, rather triangular shape and long spider-like legs that give it its name. Although many of its relatives are more like spiders than *Hyas araneus* they are not likely to be encountered between the tides.

Choose Immature Specimens

Small specimens should be obtained as the adult animal can reach a span of 12 in. from toe to opposite toe. They are variable in colour but are usually some tone of brown. These crabs have the interesting habit of disguising themselves with any available material such as seaweed and pebbles. The body is covered with hooked bristles to which these objects are secured. In captivity, if not unduly disturbed, they feel secure and give up this camouflaging activity.

They are somewhat nocturnal in habit but show some sign of activity during the day. They may be fed in the same way as shore crabs, and are also said to consume a certain quantity of vegetation which should therefore be provided. In common with other crustaceans they like a clean tank with well aerated water.

The familiar Edible Crab (*Cancer pugurus*), if a small enough specimen can be obtained, is said to be slightly less pugnacious than the shore crab. No risks should be taken in this direction, however. Small Edible Crabs may be found in rock crannies near low water, but they usually live a little further out.

Swimming Crabs

Beautiful and interesting crabs are the so called swimming crabs, *Portunus*, of which we have several species around our coasts. The common species is *Portunus puber*, the Velvet Swimming Crab. Fully grown it is perhaps too large for a small tank and rather agressive in its habits. Smaller and duller in colour is *Portunus portunatus*. Other species may be encountered but some are rare. A near-relative is *Polybius henslowi* which is the only crab that really does swim, for its two rear pairs of legs are flattened and can be used as paddles.

On our southern shores the handsome Red Angular Crab (*Gonoplax rhomboides*) may, with luck, be discovered, but it is rather rare. In the tropics crabs can be found in odd places, even up trees. While this country cannot rival this tree climbing feat, it does offer some surprises. We have the Pea Crab (*Pinnotheres pisum*) in which the female is invariably found living inside the shells of living mussels or sometimes other bivalves. The male is much smaller and wanders from shell to shell paying court to the females.

The Pea Crab is not likely to be found in mussels living high up the beach, but in those that are rarely uncovered by the tide. The only specimens I have found have been in mussels bought at an inland fish market. The mussels originally came from Conway, and out of the many pounds I have opened and cut up for fish food I have found but three Pea Crabs.

How to Identify

To list all the crabs found on our coasts would be tedious and serve no purpose. Those wishing to identify any particular species can do so with the aid of one of the standard books on British crustaceans.

Nearly all crustaceans of suitable size make attractive aquarium exhibits. Sometimes there is a high mortality amongst newly-caught specimens within a day or two of their introduction to the tank, but those that survive the first week may then live for many months.

Clean, well-aerated water is an essential. A varied diet (not carrion) and general cleanliness will go a long way towards success. Remember that nearly all of them are, by nature, fighters, so unless you want a practical demonstration of the "survival of the fittest" in your tanks take great care that your specimens are evenly matched and that they are well fed, provided with hiding places, and are not overcrowded.

Velvet Swimming Crab (Portunus puber), *a rather large and aggressive species but the commonest of the swimming crabs.* *Photographs, H. Bustin.*

Springtime tasks for the pondowner

by CAPT. L. C. BETTS

W. J. Howes photograph

WITH Springtime just around the corner, it is natural that water gardeners should begin to turn their thoughts to ponds and pools. The first tiny water-lily crown is beginning to show and on the bright, sunny days the fish lazily start to shake off the effects of the Winter hibernation.

This Winter hibernation is a very real and necessary part of the life cycle of a temperate water fish. Being cold-blooded, it has the effect of influencing their body metabolism so that in the warm weather it accelerates and in the cold weather it slows down thus forming a life cycle which develops vigour and health in the fish.

This awakening from the Winter sleep should be gradual and it is a great mistake on the part of pondkeepers to encourage their fishes by feeding them before the hard weather is over.

To do this before the water temperature starts to rise permanently, is to cause the fishes to draw heavily on their store of fat before they are able to replace the loss, thus leaving them debilitated and an easy victim to the countless disease spores which abound in every body of water.

Anyway, when the water is around freezing point, the fishes are unable to digest food even if they are able to swallow it.

Starting to Feed

The best time to start feeding is when the water holds an average temperature of 45 deg.F. and then the food is best limited to small pieces of chopped Earthworm which is nourishing, non-costive and fairly easily digested. At first, food can be given once a week and then gradually increased to daily feeds by which time the water will be around 55 deg F.

As the days lengthen and the fishes become more active it will be noticed that some fishes are not as active as the rest, whilst others swim in an unbalanced fashion or even on their side. These are the fish that have not wintered too well and are finding difficulty in adjusting themselves to the changing season.

Do not be in too much of a hurry to give them treatment as very often some extra special attention by way of tasty Earthworm titbits will pull them round. The shock of salt-bath treatment to a sick pond fish can cause its death and medicinal baths strip the fish of their natural mucous covering, without which they are more easy prey to disease.

Some fishes will be covered with a white fungus which can, if left unchecked, prove fatal. Here a salt bath will remove the Fungus but it is drastic bearing in mind that the fish is already weak.

My conclusions are that Fungus only attacks a fish which is in a weakened condition and the best treatment is to improve the living conditions and strengthen the fish so that it can build up a thick mucous protection to fight off the Fungus in its own natural way.

The incidence of Fungus in members of the Carp family is a sure indication that the fishes are not being maintained properly. I have yet to find a case of Fungus in a well maintained pond or aquarium.

What of the plant life? If the pond was not "spring-cleaned" in the Autumn, then this should be done around Easter, before the weather gets too warm. Empty the pond of

water and take away any surplus detritus and humus.

If the bottom deposits smell strongly, then there is no alternative but to take up all the plants, clean the pond and re-plant. It is to be expected that the mud on the bottom will smell a little "watery", in which case a flush through with mains water will prove beneficial.

Check on the slow-growing plants to see that they have enough room and are not being choked, and rigorously pinch back the coarser types to prevent them overrunning all else.

Water-lilies should receive attention at this stage for, after three or four years unchecked, they, too, tend to spread and choke one another. If the rootstock has more than three crowns, the latter can be separated into pairs by severing the parent stock with a spade and re-planting.

At this point it is also a good idea to remove some of the larger sucker roots and wash away the adhering mud as this mud is often anaerobic and poisonous to the fish. If you are only interested in the lilies, then the mud can remain.

There is an old idea that ponds look after themselves and need no attention. If yours is larger than half an acre, there may be some truth in it, but if it is a small, decorative garden layout like hundred of thousands of others all over the country, a little attention, as I have briefly outlined, will bring big dividends and an attractive, healthy pond.

AFRICAN BULL FROG

"Life gets tedious," seems to be the view of this well-fed African Bull Frog as it looks out on the world at large. Photograph by the author.

by ROBERT BUSTARD

THE African species, *Rana adspersa*, is undoubtedly my favourite Bull Frog. This is because it has a broad head and not a pointed snout. It is often referred to as a "box-headed frog". The mouth is huge as is the frog itself which reaches a snout to vent length of fully 7 in. Specimens in good condition are so fat that they are nearly "round" and a 7-in. specimen would measure between 5-6 in. in breadth!

This frog is very attractively marked, being a fine dark green colour above with ridges or folds of raised skin running down the back and along the sides. Small sections of these may have creamy markings. The sides give way to a yellowish colour and, below, the frog is creamy white.

The underside of the throat has greenish-brown markings and, in the region where the limbs join the body, the colour is orange-brown. This is most noticeable with the fore-limbs and these markings can be seen from the side. The ground colour of green can vary from pale to dark green or grey-green since this frog, like most others, can vary its colouring considerably.

Small specimens are particularly pleasing, having a fine bright green colour. They become duller as they grow older but are still very attractive.

In this species the hind limbs are small and largely hidden by the layers of fat. The fore-limbs are more noticeable. This species is, therefore, not able to make the tremendous leaps of the other species, but can make short jumps which are good for so blouted a creature. It is not an active species.

At the time of writing I have two specimens of African Bull Frog which I got soon after they had metamorphosed and were then only about 1½ in. long. They fed very well on gentles, bluebottles and worms and now, 18 months later, the larger is almost six inches.

They have tremendous appetites and I have found that they can be trained to take raw meat. This is a great advantage as they would otherwise go though very large quantities of worms. I cut the meat into long, thick strips and one or two strips last my specimens for a week. Alternatively they can be given several small pieces.

These strips of meat are moved about at first but after the frogs have been given the meat diet for several weeks they recognize the food without it having to be moved.

Once a week I put their meat meal beside the pool and it is usually eaten at once. If not eaten immediately, it is always gone by the morning. As a change they get bluebottles, gentles (about 100 each at a time) and large Earthworms.

These African Frogs of mine go through a regular cycle. They feed, spend a day or two in the pool, then burrow down in the mud for several days. They then reappear or I dig them out. I keep my specimens at about 70 deg F. and do not hibernate them. They make charming pets which are very easy to keep.

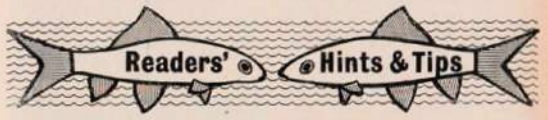
Regarding food, it is very interesting to find that this species will eat raw meat which is not moved. It is common knowledge that many frogs and toads will take strips of raw meat if they are moved about like worms, but until recently it was considered that they only recognised food by movement. In view of my experiences here this would appear to be doubtful. Dr. Walter Rose has referred to the trait in *Rana adspersa*.*

I have made no mention of the vocal ability of the Bull Frogs in this article or in my previous one in the February issue. All three species on which have been referred to can give very lusty "bellows", and the cry of *Rana adspersa* is almost human. I was most surprised to find the volume of sound that a specimen less than 2 in. could produce. Whenever disturbed they cry loudly.

I had promised to demonstrate this to the local Naturalist Society and duly took along my specimens. Imagine my embarrassment when no amount of encouragement would induce them to show any vocal ability! Strangely they have been mute ever since.

I have always been very keen on Bull Frogs and hope that the information given here and in the last issue will enable others to derive the enjoyment from them that I have had. They are certainly well worth keeping.

* *British Journal of Herpetology*. Vol. 2, No. 3, p. 60

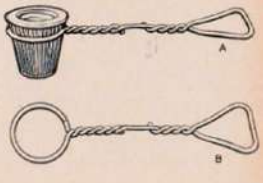


DRIED FOOD MEASURE

HERE is an idea that could help the beginner to avoid overfeeding his fish with dried food.

Take the plastic cap from a toothpaste tube and wash it thoroughly. Then, using rubber-covered wire, make a shape as shown in diagram B. Slip the cap into the ring of wire.

The toothpaste tube cap then forms a measure with which the same amount of dried food can be given for each meal.—(L. BARBER, Tamworth, Staffs.)



Tropical Reflections

by DR. F. N. GHADIALLY

THE successful breeding and rearing of large numbers of fishes requires a thorough knowledge of the methods of cultivating various livefoods, such as Infusoria, Mikro-worms, White Worms, etc. Just when you begin to feel that you have mastered it all you come up against a snag which makes you realize that there is always more to learn.

I have for a long time been able to produce any amount of Mikro-worms at a few days notice. Indeed I had every reason to be satisfied with the method I employed, for it had never let me down in many years. I had begun to feel that here was at least one problem that held no secrets from me.

The method is extremely simple; a quantity of very stiff porridge is placed in a shallow enamel pan and the surface smeared with Mikro culture. The pan is covered with a sheet of glass and kept in a warm place. The Mikro soon begin to crawl up the sides of the pan from where they can be lifted off in large numbers by the finger or a knife and washed into the tank containing the fry.

This process of the Mikro migrating from the porridge is most important, and it can be accelerated by judiciously sprinkling the surface of the culture with yeast.

Over the years I have collected numerous old enamel pans, kidney dishes and other similar receptacles in which to culture Mikro. Much of the enamel has dropped out and in some instances the edges have frayed away by rusting.

When I built my new fishhouse I decided to scrap the old dishes and use instead a matching set of six square enamel dishes built into a special rack so that they would be housed in a neat and tidy way. The Mikro cultures were set up and I waited for the worms to start migrating but nothing happened—though the porridge was teeming with Mikro, none climbed up the sides.

A pair of Angels spawned and I was now rather anxious about the Mikro-worms refusing to move. I sprinkled more yeast than I had ever done before, but the worms still would not budge.

I was completely at a loss to understand why the worms should behave in this manner. The Angels became free swimming and were kept going by extra hatchings of Brine Shrimps, but the Mikro, which I needed desperately, was not forthcoming.

I wondered for a while at the strange behaviour of the Mikro-worms and came to the conclusion that, since nothing had been changed except the dishes, it would be worth trying the old containers again. I remember once trying heat-proof glass dishes to grow Mikro-worms in but without much success, and I came to the conclusion that the failure was probably due to glass dishes being too smooth for the Mikro-worms to climb on. It seemed possible that the new, smooth enamel dishes were not to the liking of the Mikro either.

Old Dishes Ready for Use

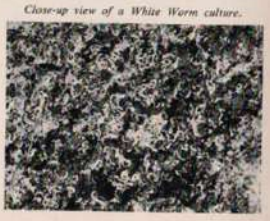
Luckily the old dishes were still lying outside the fishhouse in the garden. I quickly rescued these precious containers and set up fresh cultures of Mikro-worms in them. In no time the worms were climbing up over the sides.

Such trivial things can spell the difference between failure and success in fish breeding. The new dishes are now lying outside in the garden—when they are old and a bit rusty I hope the worms will like them!

In recent years I have learnt that White Worms (contrary to popular ideas) do not like an acid medium. This fact, first pointed out to me by Frank Arnold, has now been amply verified by me. The peat used must not be strongly acid; it should be neutral and preferably old and weathered.

Some bulb fibre bought at a chain store has also proved a very good medium for cultivating

Close-up view of a White Worm culture.



these worms. When steeped in water, and the *p*H of the water then tested, it was found to be slightly alkaline.

A sample of peat which was acidic was made suitable for use by allowing it to soak in water to which sodium bicarbonate was added. The peat was then allowed to soak in three changes of water over a period of 10 days. When finally dried, it proved an excellent medium for White Worms.

Parallel cultures set up in the same sample of acidic peat without the bicarbonate treatment proved dismal failures.

There is now no doubt in my mind that the best medium for cultivating White Worms is neutral or neutralized peat. Various mixtures of soil and sand, etc., are definitely second-rate, although the addition of some types of soil to acidic peat will produce better cultures than acid peat alone, for if the soil is alkaline it will tend to neutralize the excess acid in the peat.

But now that we know how the soil acts and that the same or better results can be obtained by other means, there is little point in adding soil to peat. If soil has to be used then it must be sterilized. This, of course, can be quite a difficult and messy procedure.

Readers' Views

We like to have your views but please keep letters to a reasonable length. The Editor does not necessarily agree with the opinions expressed.

Solitary Neon

SIR,—Independent A.S. member, Mrs. J. I. Joyce, on glancing at her community aquarium recently, had a very pleasant surprise. On looking closer she observed a baby Neon Tetra swimming freely, which appeared to be only a few days old.

Anxious not to lose this prize possession she caught it and is now hoping to raise it in a floating container, feeding it on a proprietary liquid fry food and Brine Shrimp. So far, she has been successful.

It is now 10 days since her discovery and all is well. The tank in which it was found contains 20 Neons, several other Characins and Guppies.

This must be one of the very few instances of Neons spawning and then the eggs hatching in community tank.

London, N.8 N. D. HUDSON, (Independent A.S.

Selecting Cork

SIR,—With reference to Readers' Hints and Tips (p. 176 of the February issue) I would advise J. H. Sparkes that cork cut from table mats seems to consist of tiny particles compressed together with glue and, in my experience, the moist atmosphere seems to cause decomposition of the cork, resulting in a most obnoxious smell.

Cork cut from medicine bottle corks (which consist of pure cork and nothing else) would be more suitable and my own tip for cover glass arrangement is to use rubber tubing slit lengthwise and pushed over the overhanging edge of the angle iron.

Brunton Park, Newcastle-on-Tyne. G. ROBINSON, Ph.C.

Wider Public?

SIR,—The members of my society have the feeling that many excellent talks given to individual societies by eminent lecturers in various parts of the country are worthy of a wider audience than is possible by ordinary means, and that many clubs would welcome the opportunity of hearing the views of experts from areas beyond those covered by their local organisations.

There are, no doubt, many societies who possess, or who are able to get the use of, a tape recorder and, if lecturers were willing to have their talks recorded, such recordings could be loaned to societies in other areas.

Even though there might be several talks on the same subject there would doubtless be different views expressed which could form the basis for some interesting discussions.

It is realized that such a scheme would need quite a lot of organizing but it would be helpful to have the reactions of other societies. If any clubs are interested and have any suggestions or criticisms, my committee would be prepared to pursue the matter and try to evolve a suitable scheme.

Stourbridge, Worcs. L. B. HARGEST, (Secretary, Stourbridge A.S.)

Speakers' and clubs' views on this idea would be welcomed.—ED.]

Delayed Cichlid Spawning

SIR,—What appears to be a second and delayed spawning by *Tilapia mossambica* has been observed by Mr. G. Phillips (Wood Green, London) who has bred the species on many occasions.

A number of these Tilapias of both sexes are kept together by Mr. Phillips and allowed to select their own mates. Apart from pit digging and the aggressive behaviour of the male, Mr. Phillips is able to decide when a pair has spawned by the motion of the female's throat in which she

rolls around up to 300 eggs, each the size of a grape pip.

About three days after this throat movement is first observed the female is removed to another tank, otherwise unoccupied, where she remains for between 10-28 days until the fry are free swimming and able to fend for themselves.

The female is then removed to yet a third tank, again in solitude. It has been observed that, sometimes the fish has, within a few days, again dug a pit and has eggs in her mouth as indicated by the familiar throat movement. In up to two weeks, sometimes longer, a further brood of fry are found swimming around the tank. These fry are relatively smaller and less numerous than the original spawning.

It is assumed that the fish moved into the two successive tanks is the female, although it might be expected that the male of the pair would carry the eggs as it has a considerably larger mouth.

Another odd thing about these fish is that the one carrying the young in its mouth is able to eat at the same time. Dried food is fed to it and it does not noticeably lose weight as do some other mouthbreeding species. This particular *Tilapia* will not allow its young to re-enter its mouth when once it has expelled them. If kept overlong in the mouth the fry have been dead when expelled, probably because of the parent being disturbed.

This case of what appears to be a separate, second spawning in the absence of a male fish was reported to the National Aquarists' Society. Mr. Phillips makes no claim beyond that this breeding behaviour has also been observed in his fishhouse by other experienced aquarists.

Perhaps some of your readers would like to check this for themselves and report their experiences. FRANK STONE, (Secretary, National Aquarists' Society). London, N.W.3.

Pen Pal Wanted

SIR,—I should like to correspond with a few teen-age boys in foreign countries who keep tropical fish and I would be interested to hear from your young readers.

169 Behrends Court, Morton, Illinois, U.S.A. LARRY HEINIGER.

From Continental Journals

By H. O. MUNRO

AN article by Dr. W. Ladiges on the mystery of the breeding habits of the Chocolate Gourami (*Sphaerichthys osphromenoides*) brings a summary of the up-to-date opinions and reports on this fish. He also adds his own experiences without really coming to a final conclusion.

Kramer (1905) and Racowitz (1949) both reported that the fish was a mouthbreeder as they had found eggs in its mouth. Nieuwenhuizen, Baker, Beck and Dr. Schmidt all came to similar conclusions, though they differed on whether the female or the male fish picked up the eggs.

On the other hand several aquarists of repute have reported that this species had been observed building a bubble-nest with subsequent egglaying below the nest.

Dr. Ladiges' own observations on three fishes which turned out to be one male and two females showed that the male fish before every spawning (six such spawnings were observed) constructed a very rough nest consisting of pieces of *Hygrophila* which were floated in the same corner of the tank.

The eggs were then laid below this nest and picked up by the female as they sank. Those eggs which the female missed were picked up by the male fish and blown up into the nest together with some bubbles, but that is where the male fish's interest stopped.

The female fish lost the eggs and, in some cases, the young fishes, as it was molested and chased by the much bigger male. Dr. Schmidt, however, has quite well developed young fishes which are definitely "mouth bred".

His observations bring Dr. Ladiges to the following conclusions:

1. *Sphaerichthys osphromenoides* builds a rudimentary nest with planis and some bubbles.
2. The eggs and the fry are hatched in the mouth of the female fish.

The contradictory reports of other aquarists he explains by the suggestion that several similar species, with differing breeding habits, may be involved.

Blind Species

IN the September issue of DATZ there is a description by the Yugoslav herpetologist, Paula Matus, of her experience with *Proteus anguinus*, the interesting salamander which permanently stays in the larval stage with external gills.

It is found in subterranean waters, mainly in the caves of the Balkans and Italy. It is blind, the eyes being hidden below the skin, but it is able to distinguish between light and dark.

It must be kept in shallow water of 50 deg.F. or less and its tank should be kept darkened as too much light will cause its pinkish-white colour to turn to a dark grey. It likes hard water. Movement is sluggish and only slight, unless the creature is disturbed.

Mrs. Matus fed her specimens on *Tubifex* and very small Earthworms. They are slow feeders and often refuse food for days on end. The most interesting fact Mrs. Matus has observed is the strange noise these creatures make from time to time—she compares it to the meowing of newborn kittens.

Problems Answered

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.

Breeding Angel Fish

Could you tell me something about the breeding of Angel Fish? I have a pair that have spawned once in a community tank but I now have another 24×12×12 in. aquarium available and would like to breed them in it.—(J.B., Twickenham, Middx.)

Your 24×12×12 in. tank should be quite suitable for breeding Angel Fish and we would suggest the following method. The Angel Fish can be left in the community tank with the other fish since they appear to spawn quite readily there and, if a small strip of green vitrolite, approximately 2 in. wide, is laid at an angle in the aquarium they will no doubt deposit their eggs on this.

As soon as the eggs have been laid they should be transferred, on the vitrolite, to the 24×12×12 in. tank which should be maintained at a temperature of approx. 78-80 deg.F. At the same time ten drops of a 2 per cent solution of methylene blue should be added to this tank. Slight aeration should be supplied underneath the vitrolite in order to maintain a flow of water around the eggs.

After a few days the eggs will fall to the bottom and will appear as a mass of jelly joined together by small threads. The fry will become free-swimming in another 48 hours and can then be fed on newly-hatched Brine Shrimps for the first week or so, after which they can be raised on screened *Daphnia*.

Growth is very rapid and constant culling is necessary to ensure that only good fish are allowed to grow on. It is important that the bottom of the breeding tank is placed on some insulated surface such as cork, matting, etc., in order to prevent the bottom of the tank becoming cold and thus killing the smaller fry.

Water Analysis

SAMPLES should be sent (NOT delivered by hand) in a clean pint bottle, well packed, to Water Life 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.

Lesser-known Characin

I should like to have some information on the fish called Neolebias ansorgii. *I have recently obtained a few of these tropicals and regard them as a most beautiful species with reddish fins and an emerald-green sheen to their bodies.—(J.C., Glasgow, S.2.)*

We agree with you that *Neolebias ansorgii* are very beautiful Characins. The species is not particularly difficult to breed and we would suggest the following method. A tank 12×10×8 in. or 18×10×10 in. should be planted thickly in one half only. The water should be soft, the temperature being kept between 75 and 80 deg.F., and the light subdued.

The parent fish are conditioned beforehand on livefoods and we have found that the best results

Neolebias ansorgii, *a small Characin species of shy disposition. Photograph, G. J. M. Timmerman.*

are found by giving a mixed diet of sifted *Daphnia* and Dwarf White Worms. Eggs are laid, normally, about 24 hours after the parents are introduced to the breeding tank. The parent fish must be removed as soon as possible after the eggs have been laid. The eggs hatch and the fry become free-swimming in about four to five days.

Once free-swimming the young fish can be fed successively on Infusoria, Brine Shrimps, Dwarf White Worms, etc., as they grow.

These fish are inclined to be very shy when in the presence of other species and always seem to be happiest in a small shoal of their own kind.

Tiger Barb Complaint

I have, in my small tropical collection, a Tiger Barb which has started swimming round, often over the same circular path many times, apparently unable to clear its mouth. Consequently it has not been possible for it to eat. I am worried whether the disease is contagious.—(L.M., Tonbridge, Kent.)

There are several possible causes for the condition of your fish, the most probable being a disease causing paralysis of the muscles of the mouth, thus causing it to remain open. There are several other factors which can give rise to this condition but none of them can be cured and none is infectious. The fish would eventually die and it is usually kinder to destroy it.

Breeding Information

Could you please give me some guidance on the breeding of Brown Acaras (Aequidens portalegrensis), *Scissortails* (Rasbora trilineata) *and Giant Danios* (Danio malabaricus). *Also, do Combtails* (Belontia signata) *breed like Paradise Fish?*—(*P.M.G., Hornsey, London, N.8.*)

Brown Acaras (*Aequidens portalegrensis*) are quite easy to breed. The temperature required is about 78-80 deg.F. and a tank of about 24×12×12 in. should be provided without plants but with about 2 in. of compost on the bottom and a 4-in. flower-pot lying on its side in one corner.

The fish can be placed in this tank and fed exclusively on livefood; Earthworms appear to give the best results. The eggs will be laid on the inside of the flower-pot and both parents will guard them. The youngsters will hatch and may be fed on Brine Shrimp from birth. After the first week they will be able to take screened *Daphnia* or Dwarf White Worms. The parents will look after the youngsters for four to six weeks and then should be removed.

Danio malabaricus should be provided with a tank of about 24×12×12 in. dimensions, containing tap water which has stood for about eight to 10 days and the tank should be heavily planted in one half. The parents are conditioned separately and lay their eggs in the plants. The parents must be removed immediately the eggs have been laid as they are avid egg eaters.

The youngsters will hatch and be free-swimming in three to four days, and can be fed on Infusoria until they are large enough to take Brine Shrimps and sifted *Daphnia*.

The same system can also be tried for breeding *Rasbora trilineata* with the exception that the water used should be either soft water or rain water.

Belontia signata are more difficult to breed than the Paradise Fish but the method is roughly the same except that they do not build a bubble nest but scatter their eggs over the surface of the water.

Plenty of cover should be provided in the tank as the courtship is rather violent. It is not necessary to remove the parents for two to three weeks after spawning.

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

DUNDEE is, as most people are aware, a very important port on the North-eastern coast and is one of the Scottish towns which are at present expanding in the industrial field at an astonishing rate. It is pleasing to note that it has a young but very active aquarium society.

The President, Mr. Alex. Robertson, is, of course, well known in Guppy circles. He was a most welcome guest at the last Scottish A.S. show. Being one of the first visitors he immediately discarded his jacket and joined in the last-minute rush to have everything in order by the time the show opened.

The vice-president of Dundee A.S., Mr. P. N. Greening, is also an experienced aquarist who was in fact, one of the judges at the Edinburgh show at the end of last year.

Shows in the Future ?

Due to the usual teething troubles an annual show is not yet on the programme of this society but no doubt there will be an all-out effort to make this possible in the not too distant future. The next best thing to a show is to have a competition with a neighbouring society and Dundee do this in the form of an inter-club table show with Perth.

They also travel further afield with individual entries to the larger events but have not yet formed a team to compete in inter-club furnished aquaria classes. Now that it has been seen that rockwork from the River Tay was in one of the tanks which won a major award in the recent show at Olympia, London, no doubt this is one more side of the hobby that will be touched on by the eager Dundee society.

Recently, one of the members, Mr. G. B. Kirkland, was unfortunate enough to require hospital treatment and the result was a tropical aquarium for the hospital. Another very active member is Mr. A. Cross who, despite spending many years in the Far East, still enjoys keeping Harlequins and other Rasboras, which come from that area of the world.

The time is now drawing near when a visit to a trout hatchery can form a most interesting outing for a society. Generally there is a tendency to study the tropical fish and imported coldwater fish but disregard the local aquatic life entirely.

Possibly in Scotland there is far more chance of learning about trout than in any other part of the British Isles but it is surprising how little interest is taken in this particular subject by aquarium societies.

Generally the authorities or owners are only too pleased to show parties around but it is usually an advantage if they are approached on the matter beforehand.—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"*

FISHKEEPING nowadays is probably followed in a wider range of establishments than ever before, although very often the fish are kept purely for decorative effect.

Calling recently at the famous Liverpool Animals' Hospital, or Clinic, run by the R.S.P.C.A. at Larch Lea, in Everton, I found the waiting-room made interesting with a small tank of Goldfish. After all, many children come here with their pets, and it is a good time to start them on the right lines in fishkeeping with a proper tank.

Many societies owe their progress and often their survival to the help and support of one or two patrons. In Cheshire, Miss E. Russell-Allen of Davenham Hall, near Northwich, for instance, has given much encouragement to the Chester Aquarists' Society (of which she is a vice-president) and to the Aquarium at Chester Zoo.

Miss Russell-Allen was widely known for her own fishkeeping activities but, unfortunately, tragedy came to Miss Russell-Allen's collection of thirty tanks of Veiltails (her special interest), Glowlights, Platies, Mouthbreeders and other fish, which has recently forced her to give up her collection, she tells me. After a very long spell of illness with bronchitis she found her collection so much reduced that early this year she had to make the unhappy decision to give it up.

Most of the survivors were given to the Aquarium at Chester Zoo, with which she has been so long connected and now, she tells me, she is regretfully without any fish. Happily, I learn that Miss Russell-Allen has recovered from her illness, and we wish her continued good health and a happy return to fishkeeping.

May I remind all secretaries of clubs and societies who have not received an information sheet asking for particulars of their society for the new Directory of Societies for Natural History and Cognate Studies, which the British Association for the Advancement of Science is now compiling, to apply for one to Dr. A. M. Lysaght c/o the Bird Room, British Museum, Cromwell Road, London, S.W.7), who is editing it. Aquaria and fishkeeping societies are being included, and there is no charge. As this directory will last for many years as an international reference, it is hoped to make it as comprehensive as possible.

At the Civic Hall in Ellesmere Port (Cheshire) on Saturday, February 22, the Mayor, Councillor J. Groome, J.P., opened the annual general meeting of the Merseyside Naturalists' Association. Among the recent activities of this society is the preservation of the green belt in the Wirral area around Birkenhead, including the preservation of ponds and natural waters there.

Societies celebrate the social side of their activities in divers ways. The Birkenhead Aquarist and H.S. recently held a turkey-dinner, postponed over from Christmastide. The Southport A.S. had another "fish drive" on the lines of one they had last year, and they plan to run a joint coach trip with the Merseyside A.S. to the Freshwater Biological Association centre at Lake Windermere in March.

Club Magazine

It is unfortunate that the Sheffield aquarists have, I understand, had to discontinue their club magazine, "The Ichthyologist". The Merseyside aquarists' little magazine goes from strength to strength. These "house" journals, bulletins, or news-letters are relatively easy to produce provided there is someone with access to a duplicator and the time to spare to run off a couple of sheets of notes—and enough correspondents to "feed" him.

Although we have very many books on our native fishes, Lt.-Colonel Kenneth Mansfield, who since the war has gained a wide reputation as a writer on this subject, tells me he is preparing a new book on the smaller British fishes in the series published by Jenkins. This is welcome for, from what he tells me, it will be more complete and up-to-date than some of the recent books on British pond and water life.—"Aquaticus", 47 Woodsorrel Road, Liverpool, 15.

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

I UNDERSTAND that the Bristol & Bath Section of the Guppy Federation is hoping that Bill Howe of London will be able to accept their invitation to judge at the show they are holding on May 10. The show is to be held in Temple Colston School which is within two minutes walk of Temple Meads station. This year there is a class for exhibitors who are not members of the F.G.B.S. This will give those who "have better fish at home" a chance to prove their words. The show secretary is Mr. J. Wheeler, 53 Cameley Green, Twerton, Bath.

Bristol Aquarists' Society have formed a strong committee for their 1958 show. It includes several new names. I think this is a good move because it keeps a larger percentage of the membership actively interested in the administrative side of affairs and also makes newcomers appreciate the work involved and the amount that had to be done in the past to keep things running smoothly.

I rather doubt if a pair of sash cramps have ever before been given to a lady as a mark of appreciation! Yet this was the case at the February meeting of the Bristol society and the recipient was Mrs. N. Grimston, who has just relinquished the office of secretary. Those who know her well are aware of her keen interest in carpentry.

Bristol Tropical Fish Club and Bristol A.S. are joining forces to put on a representative exhibition at the Horticultural show to be held on the Downs towards the end of the Summer.—H. C. B. Thomas, 2 Grove Park, Bristol, 6.

Midlands Miscellany *by W. L. Mandeville*

THE energetic Midlands has played no small part in the drive for export markets, and one section—the jewellery quarter of Birmingham—has more than held its own.

This closely-knit area of the City, consisting of thousands of independent artists and technicians, together with some hundreds of small fabricating firms engaged on the production of jewellery, from the cheapest imitation to high-grade exclusive pieces in precious metals, is always alert to the shifting winds of public taste.

Angling Charm

It was a maker of decorative charms—those interesting miniatures that ladies love to have tinkling round their wrists—who mentioned that of all his designs, whether in gold or silver, the one of a fish was the slowest seller, and this despite the great increase in fishkeeping which had resulted in record sales of brooches and pendants with a fish motif.

It was pointed out to him that his fish "charm"—bearing a remarkable resemblance to a bloater—was attached to the bangle by a ring through its nose, giving it a "newly-caught" look which might appeal to anglers—if anglers wore bangles.

The further suggestion that a better design would be an Angel Fish, or a Siamese Fighter, suspended by the dorsal fin and giving an impression of swimming rather than struggling, has resulted in the demand for fish charms outstripping the requests for anchors, lighthouses, windmills and bells.

General Post

From Coventry comes the news that the club's annual general meeting has resulted in an almost complete change in officers and committees. Mr. G. Glover takes the chair and Mr. J. Greaves becomes vice-chairman. Miss N. Barnatt is now treasurer (which will keep her informed of the cost of those plaques she wins so frequently !) and, with Mr. F. Prescott as secretary, the society is all set for further activity in 1958.

The annual show of this club is always a pleasurable occasion, and again Mr. F. Randall will be the mainspring as show secretary, assisted this time by Mr. J. Ellis.

Any society is indeed fortunate that can rest those worthies that have worked so hard in the past, and still not sacrifice enthusiasm or ability.

Record Breaking

For the first time in its long history, the Midland Aquarium & Pool Society was unable to carry through its A.G.M. as fog had reduced the attendance below the statutory quorum. Faced with a meagre assembly, Mr. S. Thorpe, the chairman, suggested that the first question for 1958 might be discussed. The question was soon forthcoming—"Of what use is a Goldfish bowl ?"

The discussion started tamely enough, with an early speaker suggesting that, inadequate as it was as accommodation for fishes, it had brought many aquarists to the hobby. It was then pointed out that some fishes had lived for years in such accommodation.

The discussion then came to life, points discussed were:—the retention of aquarium water against the changing of the water, the effect of accumulated dissolved solids over a long period, the effect of plants in water and whether it was not more difficult to grow plants than to keep fishes, with the additional thought that the two factors together added complications.

One forthright member, made the very sane suggestion that most of the complications existed in the minds of the experts and, so long as the fishes were unaware of them, all would be well. The only real conclusion was that the Goldfish bowl had proved very useful at this particular meeting !

The chairman-elect who will move into the chair for 1958 is a very popular choice, Mr. V. Whiting, who brings to the office the considerable experience gained in a similar position with the Walsall society. He will have little difficulty in maintaining the effectiveness usually associated with M.A.P.S. chairmen. This will be the first time that the chair of the club has been occupied by a herpetologist.—W. L. Mandeville, 327 Queslett Road, Gt. Barr, Birmingham.

For Your Bookshelf

Tropical Aquarium Fishes in Colour*

FOR the relative newcomer to fishkeeping who finds fish identification confusing, this handy volume will be of great value. Approaching 200 species are shown in colour, from paintings by N. Norvil, originally published in Denmark but now available in an English edition with brief notes on each species by Dr. Gwynne Vevers, curator of the London Zoo Aquarium.

The vast majority of the pictures will enable the aquarist to identify quite readily species he sees at exhibitions. Only a few (and here we would include the Penguin Fish and the Blue Gourami) are shown too highly tinted.

The notes by Dr. Vevers are a model of concise detail and will give the purchaser a good idea of the fishes that are depicted.

The very reasonable price of this book (9s. 6d.) brings it within the reach of most beginners to fishkeeping. After two or three years of active interest in the hobby they may have occasion to refer to it less frequently but, by then, it will have served its purpose well, acting as a pleasing primer to the identification of our aquarium fishes.

Even then, though, we imagine the aquarist will take this book down from its shelf sometimes to see whether some fish new to him is illustrated and described in its 104 pages.

* By Dr. Gwynne Vevers, illustrations by N. Norvil. 104 pages, 64 in colour. H. F. & G. Witherby Ltd. 9s. 6d.

Aquarists' Internationale

Items from Correspondence Received

by R. W. Andrews

C. BASIL JORDAN (Carrizo Springs, Texas) reports on several interesting incidents which he observed a short while ago whilst working around his large 1,500-gallon earthen ponds. They include a Mollie-eating spider, which was first noticed on the edge of a water-lily leaf, working hard at dragging the body of a Mollie up on the leaf.

An unsuccessful attempt was made to catch this spider, which was recognised as a species common to all the ponds and streams of the country.

Later in the day it was again seen on the same leaf and, after spending some time in a close watch, Jordan was rewarded by actually seeing the spider drop into the water, fasten on to a Mollie by using its legs and apparently anaesthetise the fish to stop its struggles. The inert body was then pulled out of the water on to the lily leaf, where finally the spider appeared to feed by sucking out the fish's body juices.

On another occasion Jordan was working along the verge of a pond when he suddenly became aware of a noise behind him; on looking around he was shocked to see a large rattlesnake with its head swaying as if it had struck at him and missed. A loop of the hind section of the snake was arranged on the ground to support the rest of its body, which stood up like a cobra listening to music.

It seems that it is most unusual for the rattlesnake to shows signs of fight in really hot weather, for normally they are far too lazy and if disturbed just give forth their characteristic warning rattle.

W. W. STAATS (Ripley, West Va., U.S.A.) has asked if I can put him in contact with any amateur aquarists who are also interested in radio. Apparently, in his own country, Staats is trying to form a society of enthusiasts who combine both hobbies, with a view to exchanging views and information over the air. He is also interested in the exchange of fish eggs. I understand he has bred Discus.

Plymouth Looks Ahead

PERMANENT accommodation so that an exhibition could be on view to the public at all times was what was needed by Plymouth A. & P.S., said the club's chairman, Mr. M. Kitt, at the club's annual dinner and dance on February 1.

Mr. Humphrey Woollcombe, President, said that there had been close co-operation with the Exeter club in 1957. Plymouth A. & P.S. had presented a stocked aquarium to the Ernesettle old people's home.

At the dinner, Mr. G. McAllister, former minister of a local Spiritualist church, handed over a cheque for £6 6s. 6d. to provide a furnished aquarium for a children's home. It was a share of the proceeds from a Christmas tree effort at the church.

Mrs. Humphrey Woollcombe, wife of the president, presented trophies to Mr. V. H. Summers (Woollcombe Cup for best home aquarium and Guppy Shield), Mrs. A. T. Coulett (Society Trophy for best collection of fish in home aquarium), Mr. W. Berry (Summers Cup for best coldwater fish) and Mr. Easterbrook (Hartigan Cup for best single fish in home aquarium).

The dinner was attended by 80 members and friends. New secretary of Plymouth A. & P.S. is Mr. C. R. Toner, Penare, Grange Road, Plympton, Nr. Plymouth.

Correspondents Wanted

GORDON CLINTON RYAN of Fall River, Mass., U.S.A., is hoping to form an aquarium club at Fall River and he would be interested to hear from British societies. His full address is 374 South Beacon Street, Fall River, Mass., U.S.A.

A.S.L.A.S. Programme

THE Association of South London Aquarist Societies will be holding the first of a series of three inter-club table shows on March 15. The remaining events will be held in June and September.

The March show will consist of seven livebearer classes (three for Guppies and one each for Mollies, Platies, Swordtails and A.O.V.) and four coldwater classes (Common Goldfish, Shubunkins, Fancy Goldfish and A.O.V.).

Benching will be between 2.15 p.m. and 3.30 p.m., and, while judging is taking place, there is to be a lecture by a guest speaker, Mr. R. J. Affleck, M.Sc., President of the Goldfish Society of Gt. Britain.

This table show is open to members of affiliated societies, and will be held in the A.S.L.A.S. headquarters at Sutton Adult School, Sutton, Surrey.

Major Attractions for this Year's Bethnal Green Show

FOR the 1958 annual show of Bethnal Green A.S. on September 5 and 6 in the Main Hall of 229 Bethnal Green Road, East London, the F.B.A.S. Trophy will be competed for in the class for sexed pairs of Barbs. A Bonner Cup—to be won outright—will go to the best Barb in the show.

The Open London Fighter Championship will again be held in conjunction with this event and also an all-England Mollie Championship where the Perry Cup will be awarded.

Show schedules should be ready this month and further details can be had from the show secretary, Mr. W. Wiegold, 15 Jenkinson House, Usk Street, Bethnal Green, E.2.

Australian Secretaries

FOR the information of those aquarists who correspond with overseas aquarium organisations the secretary of the Aquarium Society of New South Wales is now Mr. C. T. Merrin, 176 Newland Street, Bondi Junction Sydney.

Another society in New South Wales, the Manly Warringah A.S., has Mr. R. H. Smith, 100 Garden Street, Narraheen North, N.S.W., as its secretary.

Civic Distinction

PHILIP CASTANG, of Philip Castang Ltd., was recently elected a councillor of Potters Bar, Middlesex.

Club Notes & News

Club secretaries are invited to send reports of their activities for publication. Items should arrive no later than March 17 for the April issue. Fishkeepers who would like to know the name of their nearest society should write to the Editor.

● In his report at the A.G.M. of **Aylesbury A.A.** the secretary, Mr. C. L. Stephens, reported an increase in membership from 38 in 1956 to 46 in 1957. On March 5 members heard Mrs. M. Easterbrook speak on "Fish Structure". A social evening is due to take place on April 9.

● In 1958 the **Nottingham A.S.** celebrates its coming-of-age. It is 21 years this Autumn that a small band of enthusiasts called a public meeting to form the society. The club's annual general meeting takes place on March 25.

● The main debate at the January meeting of **Carnoxius Club (Portsmouth)** was on the Moor variety of Goldfish. Opinions were expressed on which group of Goldfish the Moor belonged. A small majority thought it was Nacreous, but others held the view that Moors were Matt fishes.

● The club annual show was discussed at the February 4 meeting of **Dunstable A.S.**, when there was a junior and general table show for Fighters. Present secretary of the society is Mr. J. Long; the chairman, Mr. R. Horst; treasurer, Mrs. E. Franklin; vice-chairman, Mr. B. Flatman and show secretary, Mr. M. Dixon, who is the holder of the Franklin Shield for the member making the greatest contribution to the society.

● Members from Salford and Rochdale societies were welcomed to a recent meeting of **Middleton A.S.**, when Mr. Partington spoke on the setting up and maintenance of aquaria and the control of some fish diseases.

● Until the first Monday in May meetings of **Portsmouth A.S.** will be held on the first and third Wednesdays of each month. After May 21 the first and third Mondays will be the meeting days. Venue is the Senior Modern Boys School, Doyle Avenue, Hilsea, Portsmouth. Officers elected at the club's A.G.M. were: President, Mr. T. Bennett; chairman, Mr. D. Nicholls; treasurer, Mr. B. Nunn and secretary, Mr. C. Smith.

● **Meetings of London Transport (CRS) Aquarists Society** are held at three-weekly intervals in 301 Camberwell New Road, London, S.E., in the Sports Association Building. A series of lectures has been arranged for 1958 as well as an annual show and ten table shows. The club is open to all members of the Central Road Service and further details can be had from the secretary, Mr. R. Yexley, 11 Arundel Road, Croydon, Surrey.

● Newly appointed secretary of **North Hants A. & P.C.** is Mr. A. E. Walters, 71 Jubilee Road, Aldershot, Hants.

● An open night was arranged by the **South London Section of the Guppy Federation** for February 27. It was hoped that all London sections would be represented and that there would also be some provincial members. An hour of films was included in the programme.

● New secretary of **East London A. & P.A.** is Mr. F. A. Petto, 52 Humberstone Road, Plaistow, London, E.13.

● Second A.G.M. of **Poole A.A.** was held on January 28, when Mr. C. R. Macdonald was elected chairman; Mr. H. J. Pearson, secretary; Mr. S. A. Goode, treasurer and Mr. D. Andrews, show secretary.

● The secretary of **Bradford A.S.** reported a successful year at the club's recent A.G.M.; membership had been maintained, the financial position improved, the stock of equipment increased and a successful show had been organised. The President thanked all officials and members of the society for the hard work they had put in during 1957, and made a special point of expressing appreciation to all the lady members. Mr. G. Taylor was re-elected President, Mrs. E. Horrocks, vice-president and Mr. K. Barrett (whose address is now 68 Moorland Road, Pudsey, Yorks), secretary. Mr. A. L. Thornley was appointed treasurer, Mr. F. H. Fennessy, publicity and social secretary and Mr. R. Winterburn, equipment officer.

● An inter-club quiz took place between **Streatham A.S.** and the Kingston society on February 21.

● Early this year **Ferranti A.C.** visited Stretford A.S. Stretford society paid a return visit the following night and enjoyed a programme which included a film show and a table show. Ferranti's A.G.M. took place on February 3. Mr. B. Carter was appointed chairman; Mr. H. G. Bowden, treasurer; Mr. F. V. Tuck, secretary and Miss B. Brooks, show secretary. Ferranti club were the guests of Belle Vue on February 5, when Dr. F. N. Ghadially gave a lecture. The remaining three recent activities of Ferranti included a club table show on February 21, a visit to Dudley Zoo and Shirley Aquatics on March 2 and a discussion group and quiz on March 3.

● The 1958 fish breeding programme was the main point of discussion at **Bristol Coldwater Fish Breeders' Group** on February 7. It was decided to place particular emphasis on producing Shubunkins, and this year there will be an interchange of stock among the members. All fishes used will be past prizewinners.

● Members of **Brockley Breeders' Circle** recently gave a talk and demonstration to a large youth club in the Forest Hill district of S.E. London. The group has firmly decided to continue its discussion technique for the main activity of its meetings; in this a member (and occasionally a visitor) gives a short talk after which there is general discussion. Meetings are held weekly. On Sunday, March 16, it is hoped to bring about 100 gallons of water from a selected source several miles away to stock a number of breeding tanks.

● Missionary life in South America was the subject o a film show at a recent meeting of **Corby A.S.**

● Officers elected at the A.G.M. of **Rugby A.S.** were Mr. L. E. Borren, chairman, Mrs. P. Herbert, treasurer, and Mr. E. F. Bennett, 109 Albert Street, Rugby, secretary.

● Recent activities of **Medway A.S.** have included the annual Fighter Cup Competition which was won by Mr. W. Knott, a Fishkeeping & Water Life Quiz, a social attended by 50 members and friends, and a talk on garden ponds.

● The A.G.M. of the **Newcastle-on-Tyne Section of the Guppy Federation** took place in January, when Mr. I. Thompson was appointed chairman; Mr. J. Mitton, show secretary and vice-chairman; Mrs. P. Dillon, treasurer and Miss H. R. Gibson, secretary.

● At the last meeting of **Llantwit Major A.S.** Mr. H. V. Jenkins was congratulated on winning first prize at the January Olympia show. Speaker on this date was Mr. F. Chapman, who gave details on breeding tropical fishes.

● Another society to hold its A.G.M. in January was **North Birmingham P. & A.S.** Mr. S. Ray was elected chairman and the new secretary is Mr. L. W. Male, 880 Kingstanding Road, Kingstanding, Birmingham 22C. Meetings are now held at Greenholme Road School, Kingstanding, on the last Wednesday of each month.

● The programme of **Kingston A.S.** has recently included a talk by Mr. Bert Cook on "Characins", and another by Mr. J. Vesper on "Coldwater Marine Fishkeeping". Mr. P. Hewitt will be the judge at a table show on March 20. An inter-club table show is being arranged with Clapham A.S.

● Annual dinner and dance of **Riverside A.S. (Hammersmith)** will be held in the Distillers' Arms, Fulham Palace Road, Hammersmith, W.6, on March 22. Recent activities have been a show for fivebearers, won by Mr. T. Thewless' Variatus Platy, and a talk by Mr. I. G. Flintham on "Judging and Show Standards".

● There will be an inter-society quiz between **Smethwick A.S.** and the Walsall society on March 12. A fortnight later Smethwick have a coldwater fish show and a talk on "Pool Construction". April 9 is the date of an inter-club debate with the Midland A. & P.S.

● Mr. S. Nelson, 72 Hope Street, Grimsby, is the present secretary of **Grimsby & Cleethorpes A.S.**

● How a boy's request for an aquarium as a Christmas present some years ago led to his father becoming one of the most successful breeders of Siamese Fighting Fish in the Derby area, was told to members of **Derwent A.C.** at their January meeting. The speaker, Mr. F. Reader, was telling the club how he started breeding tropical fish and his interesting talk was followed by a discussion on methods of breeding fishes. The chairman of the club, Mr. K. Allen, presided.

● The **Barrow-in-Furness A.S.** will be staging an aquarium display in connection with a local carnival exhibition during the week commencing March 3.

● Meetings of **Blackpool & Fylde A.S.** are held on the second and fourth Wednesdays of each month at the Veevers Arms Hotel, Cookson Street, Blackpool. A cordial welcome is extended to visitors. The show committee are making arrangements for the club's annual show in September, whilst the annual outing is being planned by the ladies' social committee. Mr. V. Fletcher, who was last year's chairman and has been an official for seven years, and Mrs. M. J. Fletcher, who was secretary for four years, have been unanimously elected life members. Mrs. Fletcher received a table lighter at the annual dinner and dance which concluded last year's activities. Main officials for 1958 are: President, Mr. V. Fletcher; chairman, Mr. G. N. Hadley; treasurer, Mr. D. H. Hammond and secretary, Mr. A. Sidebotham, 26 Wensleydale Avenue, Blackpool.

● For the February 10 meeting of **Bristol A.S.** Mr. J. McCaughan spoke on "Coldwater Catfish" and discussed whether they were harmful to other coldwater fishes.

A Year of Progress in the Guppy Federation

AT the Federation of Guppy Breeders Societies' A.G.M. on February 1 the retiring general secretary, Mr. A. J. Holloway, recorded that membership was over 300, that two new Sections had been formed (Newcastle and Glasgow) and W. London Section had been restarted. A record of three Gold Jewelled awards had been made in 1957.

Mr. P. Pavitt, provincial secretary, who travelled over 3,000 miles on provincial section business during 1957, reported that there were nearly 80 provincial members in the F.G.B.S.

Overseas secretary, Mr. R. Alley, told of an increased overseas membership, some 50 per cent up on the total at the previous A.G.M.

The Federation's 1958 annual show will be held at London Zoo on September 27-28.

"Three Counties" in Basingstoke

THE Three Counties Show will be held in Basingstoke this year on September 4-6. Show secretary is Mr. R. Forest Jones, B.Sc., 5 Park Lane, Old Basing, Nr. Basingstoke, Hants.

Mr. D. L. Edmonds, secretary of the Basingstoke A.S., won his society's champion fish contest on January 2 with a Farnal.

South Australia's Second Society

A CLUB, under the title of Tetra Aquarist Society, has recently been formed in South Australia. We understand it is only the second such organisation to operate in S. Australia. Further details can be had from Mr. E. P. King, 1 Furley Grove, Salisbury North, S. Australia.

Fishkeeping & Water Life quizzes have been used at recent meetings, each member writing down the answers as questions were read out. The winner received a pair of fish.

Second prizewinner in the miniature gardens class at Fishkeeping's Olympia exhibition in January. Rooted cacti and conifers were the main features in this entry made by Mr. B. Meadows, chairman of the Enterprise A.S.

Canadian Aquarium

VANCOUVER AQUARIUM had 342,870 visitors in 1957, including 9,351 schoolchildren, who were admitted free of charge under supervision of teachers. This attendance is all the more impressive when one learns that the total population of Vancouver is only 344,833.

"Er lot er nonsenz is torked abaht Mollies and Alghers. Mollies don't need Alghers any mor nor any uvver tiddlers. Tike it from me, an' I 'ad it from me farver, who noo summat abaht these yer fishes. 'E rized fahsands, ern good uns, who sed dat?"

I think it was Niccolo Machiavelli when he was writing to his friend Guicciadini, or was it the Duc D'Este when speaking to Cesare Borgia (of illustrious memory)? I was there on my 12th reincarnation, but I can't remember for sure who made this profound remark. I'll ask Benito when I see him on the other side.

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continued next page

Appliances—*continued*

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