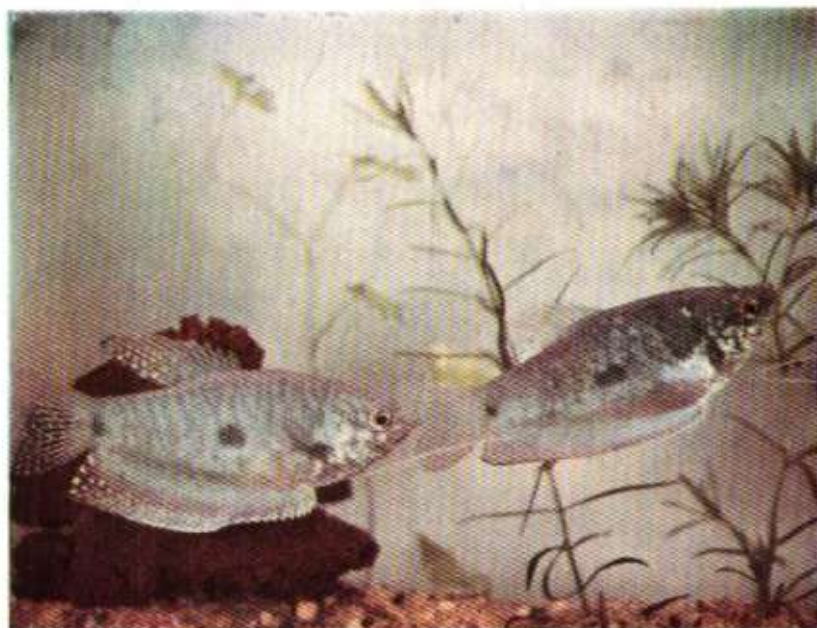


December 1958

Two shillings

FISHKEEPING

and Water Life



MALE AND FEMALE BLUE GOURAMIES

PRINCIPAL CONTENTS

Decorative Plants and Tropical Fish

Livebearing Tropicals

Modern Chinese Goldfish

Climbing Perch

Winter in the Water Garden

Beautiful Blue Gouramies

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Hundreds of Aquarists travel miles to see our wonderful selection of fishes. Are you one of them? If not, make an effort and come at the first opportunity. You will be delighted with our wonderful display of top-quality tropical fishes. The following are a few of the interesting varieties in stock at the time of going to press, but some other unusual fishes are on order and should arrive early this month.

THIS MONTH'S SPECIALS

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Metyminia Schreiermulleri	25. each
Piranhas (Red Variety)	40. each
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Plecostomus Plecostomus	12.6 each
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Otocinclus Vittatus	12.6 each
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VOL. 13 NO. 14
NEW ISSUE
DECEMBER 1958

FISHKEEPING

and Water Life

IN THE SWIM

Fishkeeping Stalwart - News from
America - Goldfish Society's
Founder - Olympia Show - Nottingham's
Celebrations - Christmas Gifts

● **Enthusiasm transferred.** W. P. Bradley will be remembered by many E. London fanciers for his loyal service to the aquarium hobby in Britain dating back to 1927.

Mr. Bradley left the Old Country last Autumn to settle in Western Australia and is now foreign correspondent for the Aquarium Society of Western Australia. He would be delighted to hear from former associates in Britain; his address is 5 Park Lane, Claremont, Western Australia.

At the recent A.G.M. of the W. Australia Society, Bruce Shipway, President for the last two years, during which time the club has made very satisfactory progress, retired.

● **American Wedding.** Gene Wolfshoener of Sherman Oaks, California, the distinguished American aquarist whose excellent photographs and articles have frequently appeared in FISHKEEPING, was married in New York on November 29. Our congratulations and best wishes are extended to him. His wife is no stranger to the aquarium hobby, having worked in the office of the Aquarium Stock Company in Los Angeles.

Gene is the co-author of a comprehensive 75-cent book entitled "The New Tropical Fish Book" published recently in America and very freely illustrated, mainly with Wolfshoener photographs. It runs to 144 pages, and includes sections on breeding fishes, Guppies, collecting fish, terrariums, marine aquaria, Goldfish, etc.

Our readers will recall the spawning experiences of Gene Wolfshoener and Dick Haas with the Red-eyed Puffer Fish (*Tetraodon lineatus*) reported on page 582 of our October issue.

Unhappily neither aquarist has been able to spawn the fish for a second time and Gene has now lost his breeding female *Tetraodon*.



Gene Wolfshoener.

● **How it began.** Whilst serving in the Middle East during the last war Capt. L. C. Betts, M.B.E., got the germ of the idea for a society which was eventually to come into being in 1948 under the title of the Goldfish Society of Gt. Britain.

Among the first dozen members which resulted from an announcement in the April, 1948, issue of "Water Life" was Mr. R. J. Affleck, M.Sc. and the subsequent success of the group has, to a great extent, been due to close liaison between Capt. Betts as the chairman and Mr. Affleck (now President) providing the scientific knowledge.

Right from the start three aims were envisaged for the G.S.G.B. 1. To protect

SPECIAL ANNOUNCEMENT

"Fishkeeping and Water Life" is to cease as a separate publication as from this issue. The decision, arrived at with much regret, is because of ever-increasing production costs.

The hobby will, however, be catered for weekly in "Cage Birds", commencing December 11, as was the case before "Fishkeeping and Water Life" was established in 1946.

every known mutation in the Goldfish. 2. To encourage members to breed Goldfish on specified lines so that the maximum knowledge could be obtained from their efforts and (3) to bring home to all the individual and so induce an atmosphere of goodwill among members.

The first of the G.S.G.B. basic varieties were introduced in 1949 and slowly the society has gained a reputation for solid achievement based on scientific facts. Today this specialist group is held in high esteem and its present position is due, in no small measure, to Capt. Betts' good humoured leadership in its first 10 years. In the Autumn of this year he gave up the chairmanship but his knowledge and experience will still be available to the society.

● **Show goes on.** Although FISHKEEPING will have ceased to be a separate publication in January the Aquaria Section at the National Exhibition of Cage Birds and Aquaria will be staged as announced in the November issue. Entries are coming in well at the time of going to press and we look forward to an attractive Section.



Nottingham Club members enjoy the entertainment at their society's 21st anniversary celebration.

● **Coming-of-age.** Gracing the top table at the 21st Anniversary Dinner of Nottingham A.S. on October 31 were Hugh Walker, Bill Shirley, Len Kirchin and Arthur Aldcock who were associated with the club at its very start in 1937. The society's bulletin editor, S. Starbuck, brought out a special edition in October to mark the milestone in this club's history. In it founder members recall some of the highlights of earlier days, some humorous, others marking solid achievement.

Len Kirchin tells of a pre-war club dinner when a power failure resulted in the festivities being continued by candlelight. Hugh Walker's daughter, Hilary, recalls that her childhood days were freely influenced by the fishkeeping and herpetological activities of her father.

Helping father in the garden meant, to her, not just weeding, but pulling up worms for frog food!

Yet another contributor recalls four carloads of members going on a pond hunt "Picture this party of people," he says, "complete with tins, jars, nets and what have you, hiking across a series of damp fields and muddy paths to find an arrival that the pond was completely enclosed in barbed wire."

SEASONAL GOOD WISHES

from
FISHKEEPING AND WATER LIFE

By the end of 1947 membership stood at 100. At the 1948 show members bought back programmes from visitors who were leaving, so that they could be sold again—such was the demand. Show attendances reached their peak in 1950 with 20,000 visitors recorded.

And so, like many clubs, Nottingham has a proud record on which to look back. We wish it a flourishing future.

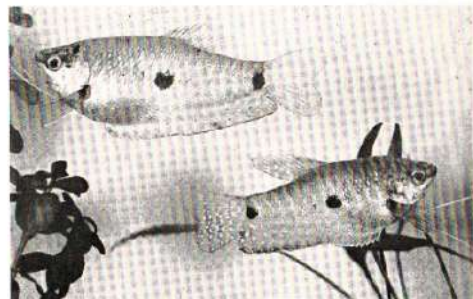
● **An ideal gift.** The Christmas gift problem is with us again and it is timely to mention Bryner's "Guide to Tropical Fishkeeping", a comprehensive work on its subject and freely illustrated throughout in colour and with black-and-white photographs. Modestly priced at 35/- or 36/9 if ordered direct from Dorset House, it is a volume which will be frequently referred to by the recipient and invaluable to him or her in pursuing the fishkeeping hobby.

● **Past and future.** In this last issue of "FISHKEEPING AND WATER LIFE" we should like to thank our many thousands of readers who have given this journal their support over the last 13 years.

We believe the hobby to be worthy of a high-class production and have attempted to provide this but costs have outstripped revenues.

We feel this paper has played a significant part in fostering the hobby and we hope to continue our association through the fishkeeping features which will appear weekly in "Cage Birds", commencing with the December 11 issue.—L.W.A.

FISH OF THE MONTH



Pair of Blue Gouramies. Male is the larger fish. G. J. M. Timmerman photograph.

BEAUTIFUL BLUE GOURAMIES

By R. W. ANDREWS

WHILE sorting out a newly-arrived can of fish, I found that two Blue Gouramies (*Trichopodus trichopterus* var. *sumatranus*) had been added to make up the order.

My immediate problem was where to find accommodation for the two fish of just over an inch in body length. Knowing the species to be of a peaceful disposition, I finally decided to put them in a tank already containing several *Apistogramma retzi*, which were of a similar size to the Gouramies.

After a little while it became obvious that whilst the Gouramies were in fine condition and growing fast, the *A. retzi* were clearly losing condition. A more careful watch on the tank disclosed that the Gouramies were, in fact, gorging themselves to bursting point on the best part of the food that was given, not allowing the more dainty, slow feeding, *A. retzi* a chance to take any.

Fortunately, at this time, a spare, *Crysiptocornis*-planted tank became available and the Gouramies were transferred to it, so giving them a 30 x 12 x 8 in. aquarium on their own. On a daily diet consisting mainly of *Tubifex* worms and wheat-germ dried food,

their growth continued unchecked and it soon became obvious, from the differing development of their respective dorsal fins, that I had a sex pair.

The male shows a broader and longer dorsal than the female. Coloration of both sexes is nearly identical, being blue-grey along the back merging into the silvery-blue of the underparts. A large black spot appears midway along the lateral line and a second at the rear end of caudal peduncle. The yellow-tipped finnage is dotted with orange and red spots.

Change of Behaviour

The first signs that a spawning of these Gouramies was a possibility came when the fish had both attained a body length of about 2 1/2 in. One day I became aware that the pair were not following their normal behaviour of almost constantly showing themselves towards the front glass but instead were keeping mostly to the background plants. On lifting the aquarium light shade and examining the water surface I found a number of little clusters of bubbles all along the back area but no signs of eggs anywhere.

For the remainder of that day and the few following days I saw the male blowing bubbles in many different places, but it certainly appeared that his lackadaisical performance was without any true instinctive breeding urge and the female only seemed to be amid the planted area because her companion was there. In fact both fish eventually returned to normal activity.

About two weeks later, however, I noticed that the female was looking extra well rounded in the belly region, so I decided to try and stimulate a spawning. The tank temperature, which averaged 78 deg.F., was not altered but every alternate day a pailful of the tank water was exchanged for the equivalent amount of two-day-matured tap water, at equal temperature. Incidentally my domestic water supply is both alkaline and hard.

Result of the Water Changes

It was immediately after the third exchange of water, that the pair once again took to the cover of the plants and late that day the male was seen to be busy blowing bubbles.

On the morning of the following day the whole atmosphere of the tank had changed, both fish displaying a much heightened colour and obviously in a state of nervous excitement. This was shown in the male by his sudden dashes to a surface bubble-nest to add a few more bubbles and then, through all erect and quivering, making return dashes to swim around the female, who intently watched every move that her mate made.

It was noted that the male confined his bubble-blowing activities to just one area, near a back corner of the tank, but the nest itself was a somewhat scattered affair of small clusters of bubbles, interspersed between the trailing leaves of a *Cryptocoryne* plant.

Spawning Method

The actual spawning of these fish took place during the early afternoon. It followed the typical Gourami procedure of the male wrapping the female beneath the bubble nest, up to which the expelled eggs floated. On completion of the spawning the female was not removed as she had retired to the opposite end of the tank and showed every inclination of keeping away from the nest area which, incidentally, the male was obviously prepared to guard zealously. The top lighting was reduced to a 25-watt bulb and a square of green mica was placed on the cover glass to diffuse the light, yet allow sufficient illumination to allow observation of the nest area.

It was on the morning of the fifth day that the fry were seen to be fully free-swimming and, as the male's behaviour raised some

doubt as to his parental instinct lasting any longer, both he and the female were taken from the tank.

First Food for the Fry

The first nourishment given to the fry was a proprietary liquid fry food plus a little dust fine dried food. After the first week this diet was varied by feeds of egg infusion, the latter being given by placing a small piece of hard-boiled egg inside a folded bag, the material for which having been cut from an old nylon stocking. When the bag was gently squeezed just beneath the water surface a fine cloud of egg particles was released which remained suspended in the water for a considerable time, so giving the fry every chance to have a good meal.

On this diet the fry made steady growth, but once they started taking Mikro-worms, a rapid increase in size was obvious and the young fish were soon able to manage finely-chopped *Tubifex* which, along with a variety of dried foods, became their basic diet through the young adult stage.

READERS' HINTS AND TIPS

ANCHORING THE FISH FEEDER

IN this arrangement the socket is fixed to the lower part of the thermometer and the feeding ring is fitted over the thermometer as shown in the sketch. The feeding ring can then follow variations in surface level.



Perforated feeding rings may be fitted to the thermometer by means of a small nylon loop. —W. STOLT, Annecy, France.



The Goldfish variety known as "Lion Playing Brocade Ball", is highly developed form.

MODERN CHINESE GOLDFISH

By R. J. AFFLECK, M.Sc.

It was natural that, in the past, some tales about life in China and the things found there should be figments of the imagination rather than accurate reports. China is a long way off and stories could not be readily checked.

I can remember being told when I started keeping Goldfish that, in various temples of China, there were the most fabulous Goldfish which no Westerner was allowed to see. The Egg Fish (which was exactly like an egg—so I was told) and the Meteor, which had no tail, were spoken of in bated breath.

Published Information
Later, when I had access to scientific literature, I read the extremely valuable paper by Dr. Chen who, in 1925, gave an account of the main variations in the external features of Chinese Goldfish.

Dr. Chen's work showed what remarkable mutations had arisen in Goldfish and how, by careful selection, Chinese Goldfish fanciers had maintained and developed the different

varieties. I learnt that the Egg Fish did not look much like an egg and that there are no breeds without tails.

Main Variations

The main variations in external features are as follows:—BODY—long and slim or short and deep; CAUDAL AND ANAL FINS—single/double; ALL FINS—short/long; DORSAL FINS—present/absent; EYES—normal/protruding sideways/protruding upwards; SUB-ORBITAL REGION—normal/with fluid-filled sacs; HEAD—normal/with bramble-like growth; NASAL SPERM—normal/enlarged; SCALIS—normal/domed; OPERCULA—normal/outfolded; REFLECTING TISSUE—much/little/intermediate.

In recent months members of the Goldfish Society have seen a beautifully illustrated booklet sent to me by the China National Native Produce Export Corporation. The reproductions are in colour and represent some of the first-class specimens now being bred in China.

Recently I have also seen a Chinese film in colour of modern Goldfish. The types of fish



Two Chinese Goldfish types: left, "Purple with High-Head" and, right, "Floral Phoenix". Illustrations from China National Native Produce Export Corporation booklet, "Chinese Goldfish".



Another Chinese Goldfish variety, this time the "White with Red Cap".

in both the film and booklet are the same and there is no doubt that they represent the best Goldfish found in China today.

All the variations in structure described by Dr. Chen are to be seen today but there are no new ones. There are, however, new combinations—e.g. a fish with both globe-eyes and pen-pon.

One of the great achievements of the modern breeder is concerned with the colours of Metallic fish. Breeds now exist in which definite colour patterns are produced in orange and silver, purple and orange, or black and silver.

The photographs reproduced here show four of the varieties in the booklet. *White with Red Cap* appears to be a type of silver-metallic

Oranda with the hood, red in colour, confined to the cranial region. *Purple with High Head* is another type of Oranda but this time with a full hood. The colour is a purple-brown which appears to be due to some new pigment.

Pen-pon Type

Lion Playing Brocade Ball is a magnificent Pen-pon similar to the type illustrated in the April, 1958, issue of *FISHKEEPING*.

The *Floral Phoenix* (Floral Phoenix's Egg) is the fabulous Egg Fish. The *Phoenix* has a short, deep body, no dorsal fin, double caudal and double anal fins. Those illustrated are Nacreous and the colour arrangement is known as floral.

Tropical Reflections

LIKELY DEVELOPMENTS IN THE HOBBY

by DR. F. N. GHADIALLY

THIS is the final article in the series entitled "Tropical Reflections". For three years I have commented upon and discussed various points of interest to the aquarist but have now covered more or less all the interesting topics that I can think of.

In this last article I should like to reflect on some future developments that I would wish to see in the hobby. The first thing I would place on the list would be the creation of a dried food or dried foods that would entirely replace livefoods and fresh foods. I wait for the day when catching *Daphnia* or culturing

White Worms may become a mere waste of time and energy.

This is not such a fantastic suggestion as it may appear at first sight. After all, rats and mice used in laboratories have been kept alive and in perfect health for many generations on a dehydrated pellet diet. If it can be done for rats, it can be done for fishes.

Reluctance of Fish

One of the main snags in attempting to develop the ideal dried food is the reluctance

on the part of fishes to eat what is good for them. In common with some children and most adults they do not appreciate what is done for their own good!

The addition of some particular item to improve the diet, though sound scientifically, may prove useless in practice because the fish do not like the taste of the new mixture. Nevertheless, the problem is not beyond solution.

Another thing that I would like to see would be a more extensive use of filtration in decorative aquaria maintained by aquarists. Many such tanks are anything but decorative.

In over 75 per cent of the cases when I visit aquaria they do not have a perfect tank which they can display proudly, but only excuses such as, "Oh, I have not had the time to do much with the tank lately" or "The water was crystal clear a few days ago but the wife put in a little more food than she should have yesterday" or even "I have never had algae trouble before but the plants are getting a bit covered with algae now".

Hundreds of such excuses are given why the gravel is black, why the glass has not been scraped, etc., etc.

Now all these troubles can be avoided, or should at least be quickly rectified, and there is no single thing that helps more towards the effortless maintenance of a good decorative aquarium than an adequate filter.

I know full well that you can maintain a good tank without the aid of a filter but I am also equally certain that it is infinitely easier to keep a tank looking spic and span every day of the year if a filter is helping you to do this.

Many aquarists almost feel insulted if you suggest that they should use a filter. They feel it reflects badly on their aquarium technique or knowledge. I cannot condone such an attitude, we should not be ashamed to use any technique which lightens our task or improves the final results.

Aid of a Filter

Errors in feeding and tank management occur in the best of hands and, instead of waiting patiently for the not too bright water to clear, why not let a filter help you? By removing large amounts of particulate organic matter you also remove stuff that ultimately breaks down to encourage algae on the plants and glass.

The development of black or foul gravel is once more much less likely in a tank where filtration is employed and the number of times that the front glass needs scraping is also considerably reduced.

The next thing I would like to see in the near future would be a return of larger-sized fishes

for sale in shops. In the last two or three years there has been an increasing tendency to sell smaller and smaller fishes until today Tiger Barbs and Nenas may be no more than about 4 to 4 1/2 in. in length when offered for sale.

Noxious who place these fishes in their community tanks find that they prove no more than tasty bits of livefood for the larger fishes. It is no use blaming the traders for this state of affairs. We create the demand, they supply it. If we insist on bigger fish we shall get them though we must be prepared to pay more for them. The continuous demand for cheaper and yet cheaper fish has led to smaller fishes being offered for sale.

Importance of Quarantining

Finally, I would like to see greater attention paid to quarantine and disease prevention instead of continuous dosing of tanks with all sorts of concoctions for treating sometimes real but, quite often, imaginary ailments. Almost every month I get letters giving elaborate descriptions of mysterious diseases, the like of which I have neither seen nor read about.

At society meetings you can be sure that somebody will describe some peculiar condition with which his fishes are afflicted and the person then expects the poor lecturer, not only to give the correct diagnosis, but also to give a sure-fire treatment.

How can one diagnose these mysterious conditions from a distance without even seeing the fishes? In the majority of cases I find it



A filter can be a great aid in maintaining a decorative aquarium. A corner unit and outside filtering system. There are also sub-gravel and outside filtering filters.

quite impossible to offer much help or advice under such circumstances.

The only advice, based on personal experience, that I can give is this. If your aquarium technique and feeding is adequate and if you really follow the principles of quarantining fish and plants and all other wet objects, then it is highly unlikely that any serious calamity will befall your piscine community.

POINTS TO LOOK FOR IN GROWING GOLDFISH

THE bramble-like growth on Bramblehead Goldfish is not present when the fish hatch but should be noticeable within six months.

At hatching no nasal septa are present on any variety of Goldfish but by about six weeks they have developed. In Pom-poms the septa enlarge considerably and, at three months, are perceptibly larger than the normal ones.

Reflecting Tissue

No reflecting tissue is visible in Goldfish when they hatch but afterwards it is developed progressively and, by about two months, can be clearly seen in Metallic fish. The development of this tissue is early inhibited in Naereous and Metil fish and, in two months, they can be distinguished from Metallics.

Pearl Scales appear normal at hatching but later the "pearls" develop and should be recognizable at two months.

The absence of a dorsal fin may be discerned under a microscope when the aëvian hatches. Without a microscope, the absence of the fin may be seen quite easily at or before a month if the fish is placed in a glass vessel.

Fishes with divided caudal fins should be selected as early as possible and, after a fortnight, there is little difficulty in so doing if the fish are examined from above. Divided and fins present more difficulty than caudal fins but, after one month, the fish, placed in a small glass vessel, may be examined from below. A suitable container for this purpose is a clear glass jar.

A preliminary selection for long/short fins with rounded/pointed extremities should be made at about three months but this should be followed by a more critical examination at six months.

The selection of Metallic fish with reddish-orange and silver markings presents little difficulty. Fish in this group should begin to change colour at from one to six months and all fish which have not changed after a year



Tachbrook Tropicals photograph giving a head-on view of a handsome Pearl Scale Goldfish.

should be eliminated, no matter how good they may otherwise be.

The first sign of a colour change is a darkening, particularly on the back of the fish. This darkening may be continued until the whole upper part of the fish is black but often, especially in those fish which change colour quickly, the initial darkening is followed quickly by a decrease in the black pigment.

As the black decreases, the orange or yellow pigment increases in intensity. In the ideal fish orange or yellow pigments do not develop in some regions, so that, after the elimination of the black, the regions are silver. The silver colour of a good specimen should be seen as soon as the black disappears and must not be confused with the silver of an old fish when the orange colour fades.

How the Black Develops

The black of a Metallic Globe-eye develops initially like the darkening in an ordinary fish but is not followed by a sudden decrease in the black pigment. The best fish have so much black pigment above the scales that little or no shine can be seen. However, a certain amount of reflecting tissue may always be seen under the belly. In good strains the intensity of the black increases with age up to 12 years while in others the black decreases and is replaced by orange.

It cannot be stressed too strongly that the body of the fish is the most important feature of all. No matter how good the fins or other features may be, the fish is useless if it lacks a well-developed body.—R. J. AFFLECK, M.Sc.

SCOPE WITH THE LIVEBEARING TROPICALS



Pair of the prominently marked Wagtail Swordtails (*Xiphophorus helleri*).

They give a wide choice to the aspiring aquarist

by "OSTREA"

TO many experienced aquarists the livebearers are a group of fish to be dismissed with a wave of the hand. They are so universally found in the aquarium world, in general are so easy to breed and, therefore, usually so reasonably priced, that many fail fully to appreciate their true worth.

They provide an extraordinary range of size—from the tiny male Mosquito Fish, 1 in. long, and the smallest of our aquarium fishes, to the six-inch and larger male Swordtail (including his sword), and the nine-inch *Mollies* (*Mollienesia vittifera*, one of the largest species

to be kept in a home tank. They include almost every colour, and combination of colours imaginable, even pure whites (Albinos) and jet blacks.

As show pieces, by themselves, a pair of handsome Red Wagtail Swordtails, for example, can well hold their own, with their beautiful smoothly uniform red bodies and pure black fins and tails. But I think that the Guppies and Platies also set off, in many cases, the more formal and less colourful patterns of other fish, such as Tiger Barbs (*B. tetrazona*) and Gouramies.

With very few exceptions all the aquarium-kept livebearers belong to the Family Poeciliidae, with 23 Genera and 37 different species and there is a large number of hybrid and varieties in individual species that are officially, or semi-officially, recognised. The diversity of types available can well be imagined.

Classification of the Fishes

The full classification of the Poeciliidae is as follows:—Kingdom: *Artemia*, Sub-Kingdom: *Metazoa*, Phylum: *Chordata*, Sub-Phylum: *Cranialia*, Class: *Pisces*, Sub-Class: *Neopterygii*, Order: *Microsyrini*, Family: *Poeciliidae*.

Personally, I have kept relatively few species, the ubiquitous Guppy or Rainbow Fish

Female Mosquito Fish (*Heterandria formosa*), which grows to 1 in. Males are even smaller.



Fishkeeping, December 1958

(*Lebistes reticulatus*), perhaps the most colourful and kaleidoscopic of all aquarium fishes; the Mosquito Fish (*Heterandria formosa*), nothing to do with the insect or that name so much in the news just now, as the fish actually coming from the eastern parts of the United States of America including Florida, and the word "formosa" meaning "comely" or "handsome"; various *Mollies* (*Mollienesia*), Swordtails (*Xiphophorus helleri*), and several Platies and hybrids of them.

My experiences with all these fish are no doubt those common to other aquarists. They all make good community fish and are peacefully disposed towards other Genera as well as to each other.

The sole exceptions, among those species that I have kept, are male Swordtails. If a number of these are kept in a tank one always seems to become the "boss"—hounding the other males into a corner of the aquarium, depriving them of food, and reducing them to very poor specimens in a short space of time.

Swordtails and Guppies are very quick-moving fish, darting "hither and thither", enlivening the aquarium scene a lot and, to my cost, I know what magnificent jumpers Swordtails are.

Mollies and Platies, on the other hand, are much more slowly moving fish, and a 24 x 12 x 12 in. tank of these provides a truly restful picture. I find that they do very well with Gouramies, and also in a 36-in. tank with Angel Fish (*Pterophyllum eimekei*) which are also graceful, slow-moving fish.

For several years I have kept my livebearers, as indeed most of my fishes, at a temperature of 68-70 deg. F. and they do very well: colour and size being equal to any I have seen maintained at higher temperatures. I think, however, that they breed less often, and that each brood may take longer to mature, than is the case at higher temperatures.

Water Conditions

The fish are not fussy as to hardness or pH value of the water, but Mollies do much better with a teaspoonful of common salt (sodium chloride) added to each gallon of water. More salt should not be added when topping up but only when replacing water drawn off, otherwise the salt concentration will become too strong and, although the Mollies may not mind this so much—at first, the plants most certainly will, with fatal results.

Feeding presents no problems at all. These fish are omnivorous. It is important, nevertheless, to see that the particles, or creatures, fed to them are small enough for the particular fish. I always grind up the prepared foods, using those with a low starch or carbohydrate content, with a pestle and mortar, and then

pass them through a sieve to obtain the appropriate size of particle. Old tea and coffee strainers are ideal for this purpose.

For some time I have mixed paprika pepper with the dried food, about one part pepper to 20 parts of food, giving one feed a day of this and I certainly think that the colours of the fish are enhanced by it. Dr. F. N. Gradually suggested using this addition to the food in WATER LIFE for June 1956.

Crushed water snails are a favourite food. I merely crush these of a suitable size within reach in the tank, with a pair of long-handled, flat-ended tweezers and, as the soft mass falls through the water, the Swordtails dive like creatures possessed, catching the snail food as it falls.

Mollies and, to a less extent Platies, require a little boiled (not too softly) spinach or some other green vegetable, every day. When-gem dried food makes a very suitable and easily prepared substitute.

Breeding is just too easy with the more popular types of livebearers, with the exception of the Mollies. "Too easy" is a literal expression; if one desires to maintain a good strain, or to experiment with deliberate hybridization then great care is necessary. The majority mature in six to 12 weeks and a female may become fertilised before one has decided its sex and segregated it.

I have observed that the larger and, therefore, wither limits, the older, the female is, the bigger is the brood of fish. The largest number of young I counted was from a four-inch long female Red Swordtail which kept me up till two in the morning while she shed 204 young—I covered a sheet of notepaper with pencil strokes—one for each youngster dropped! This, I am well aware, is no record.

If Mollies with young are handled in any way, or even unduly disturbed, they are more often than not liable to shed the young prematurely and die. For this reason, the breeding pair should be placed in a separate tank and, when the female is obviously carrying young, the male is removed. After the fry are dropped, the mother is replaced in the community tank.

Guppies breed so freely and can fend so well for themselves, that I always keep a few in my community tanks so that the inmates get a supply of livefood from time to time in the form of Guppy fry, even if I am unable to provide them with any other livefood for a period.

A number, mainly female Guppies, may develop bent backs; and in the case of Golden Guppies, white, chalk-like lumps just under the skin, usually near the head. I have not yet ascertained what this latter condition is, but I remove all such curts, and discarded stock, as soon as they are noticed.

DECORATIVE PLANTS AND TROPICAL FISH



L. E. Perkins' impression of one of the aquarium and house plant designs of D. J. Robinson.

D. J. Robinson's layout described by LAURENCE E. PERKINS

MANY aquarists keep fish efficiently and are successful in their attempts at breeding various species but not all are able to combine efficiency with beauty or artistry in their fishrooms or fishhouses.

Mr. D. J. Robinson, of East Dulwich, South-East London, however, has succeeded in transforming his fishroom into a floral arbour by combining the cultivation of indoor plants with his fishkeeping hobby.

The room measures only about 10 feet by 10 feet and, apart from the practical limitations this imposes upon the use of a camera in any attempt to capture the effect displayed, it would be impossible to convey the atmosphere and pleasing spectacle which confronts the visitor.

The accompanying drawing may give some idea of the general effect of the main feature which comprises a framework consisting of a top section for plants, a 36 in. x 16 in. x 16 in. furnished aquarium immediately below, and an 18 in. x 10 in. x 10 in. furnished aquarium at the base. In the top section the plants (*Saintpaulia* or African Violets, *Chlorophytum*

species and ferns) stand on sheets of expanded aluminium which, in turn, rest upon trays of water, each plant-pot being watered by means of a nylon wick protruding from the pot bottom down and into the trays.

The aquarium is most attractively furnished. Mr. Robinson standing beside some of the decorative foliage which flourishes around his tanks.



with four species of *Cryptocoryne*, two species of *Hygrophila* and Indian Ferns and supports a small community of Oyaline Gouramies, *Panchoa hamonidatus*, *Rasbora daniconius*, a small Sucking Catfish and a *Corydoras neri*.

The lower and smaller aquarium contains a pair of Chocolate Gouramies at the moment and serves to finish off the feet of the feature. Two Grape Ivy plants (*Cissus rhomboides*), one on each side, climb up the front uprights of the framework from pots placed on the floor and complete the effect of natural informality.

On a shelf in the window Pelargoniums and fibrous Begonias flourish while, on another wall at a height of about six feet, more Begonias and African Violets form a colourful array under their own fluorescent lighting unit.

Another Set-up

The fishroom contains another framework rack which houses three large aquariums of approximately 36 in. x 15 in. x 15 in. dimensions. Two of these contain mixed communities of Dwarf Gouramies, Harlequins, young Angels, etc., whilst the third provides separated quarters for two large Cichlids—a Brown Acara and a splendid specimen of *Heterichthys cymatognathus* (Texas Cichlid).

Mr. Robinson started to keep fish about seven years ago with one aquarium. As his interest grew so also did the number of aquariums until he now maintains a total of 11 large ones. The cultivation of the plants commenced a little later with a single specimen of *Sainpaulia* from which he has propagated, by taking cuttings, his present large collection. The numerous fibrous Begonias have all been grown from seed.

Well Planned

The excellent condition of aquariums and plants is due entirely to a well-planned combination of the requisite factors. Each tank has its own heater and sub-gravel filter and all aquaria and plants receive illumination from fluorescent tubes mounted directly above them, a time-switching device ensuring a regular supply of light during Mr. Robinson's absence.

The average temperature of the room throughout the year is 60 to 65 deg. F. which, combined with the attendant humidity from the aquaria's evaporation, constitutes ideal conditions for the plants.

Mr. Robinson is a keen member of the Friends Aquarist Society and has won the first award both this year and last in the home furnished aquaria competition. He also holds the society's challenge shield for the best

six fish which he won with his Opaline Gouramies. He has an exceptionally fine strain of these very attractive fish and enjoys considerable success in breeding them.

Fish Philately



Two-spot Wrasse

THE name Wrasse is applied to a group of brilliantly coloured marine fishes with thick, protruding lips and prominent teeth. Specially adapted to deal with the shell-fish which form a considerable part of their diet, they have in the throat an upper and lower set of crushing teeth.

Wrasse inhabit coastal waters, preferring places where the sea-bed is rocky or thickly overgrown. For breeding purposes they pair up and construct a nest of seaweed in which their eggs are laid.

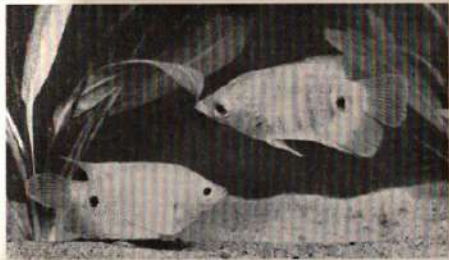
The species *Labrus bimaculatus*, is one of the most richly coloured of all Adriatic fishes. This 70-dinar stamp issued by Yugoslavia shows the fish in natural colour against a background of dark grey-green. For all its gorgeous colour, this Wrasse is rarely seen to advantage in the clear waters of the Adriatic, for it spends the greater part of its time lurking amid the marine flora or in the shade of crowded rocks.

Another member of the Genus, the Cuckoo Wrasse (*L. asotifagus*), which has been the subject of considerable scientific investigation, has been found to have two colour phases—one red, the other very dark green or black.

JOHN WAKEFIELD

Fishkeeping, December 1958

AQUARIUM FISHES FROM CEYLON



Giant Gouramies (*Ompok petersii*) which grow to 24 in. W. Hoppe picture.

No. 7. Fishes of the dry zone

by RODNEY JONKLAAS (Ceylon)

THE dry zone of Ceylon covers a vast area of the land in the north, north central, east and south-eastern portions of the island. Here the rainfall is more or less restricted to a single season, called the North-east monsoon, which lasts from the end of October till about February and, after that, there is a prolonged period of drought.

The fish population, apart from the lagoon fauna and those in the higher hills, lives in rivers fed from distant mountain streams and in man-made irrigation lakes, called "tanks". These were built many centuries ago by the ancient civilisation that flourished in Ceylon; many were in disuse, some lasted, and now a good few have been restored and are invaluable sources of water for food-crops.

Adaptation of the Fauna

The fish life of this region has, accordingly, adapted itself to man's works. In very ancient times it might have been quite different from now, but there is no way of proving this point.

Generally speaking, the fishes of the dry zone are exceptionally hardy, fast-growing, prolific and adaptable to varying conditions of temperature, pH and oxygen content. They can stand crowding to a considerable

degree and survive in the very foul water. A few can hibernate in the mud during a severe drought.

Typical dry zone fishes are the following:—*Barbus ticto ceylonensis*; *Labeo labeo*; *Rasbora daniconius*; *Labeo dasanjeri*; *Barbus sarana*; *Barbus doerrii*; *Amblypharyngodon maceleanus*; *Wallagonia aita*; *Mystus keelata*; *Mystus gulosus*; *Exocoetis danicus*; and *Ophiocephalus muriei*.

Others, which are often found in the dry zone, through human agency or having travelled up rivers and so entered lakes connected to them by irrigation channels, are:—*Epiplatys varanensis*—in pure freshwater; the Orange Chromide (*Epiplatys maculatus*)—in pure freshwater; *Mogonostichus apollinaris*; *Mastacemebelus arratus*; *Barbus bimaculatus*; *Barbus filamentosus*; *Barbus eunigri* (referred to as the Giant Danio (*Danio malabaricus*)); *Gaura ceylonensis*; *Lepidochelys thomasi*; *Ophiocephalus striatus*; *Ophiocephalus gachua*; *Mystus vittatus*; *Ompok bimaculatus*; *Heteropomus fossilis*; Climbing Perch (*Anabas testudineus* or *scandens*), and *Glossogobius aureus*.

The latter are, of course, more typical of other regions referred to in previous articles of this series, but being hardy and fast-breeding, and aided by irrigation channels and

man-made lakes, they are now common in the dry zone.

Rasbora daniconius, of course, is the most ubiquitous fish in the fresh waters of Ceylon and it is felt that its most suitable habitat is the dry zone. With the exception of this fish, most of the species in the first list are found only in the dry zone, rarely elsewhere unless transported specially by human agency into lakes, ponds, etc. outside the region.

Introduced by the Department of Fisheries, and now widespread in the dry zone, is *Tilapia mossambica* which is fast reaching pest-proportions. Many years ago some *Ophiocephalus gaurami* escaped into a major river from a pond in Kelaniya, Botanical Gardens, Kandy. These have since established themselves very well in the lower swamps, tributaries and backwaters of this river and spread over a vast area. They are now considered a growing and important freshwater fishery, which the Department of Fisheries is encouraging by stocking, pond-raising and distributing to farmers all over Ceylon.

The typical dry-zone fishes, as mentioned before, are hardy, fast-breeding, fast-growing and voracious. They range in size from the diminutive *Barbus ticto ceylonensis* to the huge *Ophiocephalus muriei* which reaches 10 lb and the *Wallagonia aita* Catfish which often exceeds 40 lb!

Many of the dry-zone fishes are harvested each year during the drought and sold as food. Some, like *Barbus sarana*, *Ophiocephalus striatus*, *O. muriei*, *Wallagonia aita*, *Glossogobius aureus* and *Ompok petersii*, are good sporting fishes sought after by anglers.

Suitable for the average aquarium are all the smaller ones, but most attractive is *Barbus ticto ceylonensis* which differs slightly in size and colour from the more familiar *B. ticto* of

India. The Ceylon strain sports a rosy pink on its body scales in the male during breeding time, and has, in addition to the two main dots, several smaller black specks in the central body region.

Labeo labeo is a recently exported Danio-like blue fish which is hardy, easily bred and peaceful. Its maximum size is three inches. *Amblypharyngodon maceleanus* is a very silvery fish with large eyes and very little appeal. It superficially resembles a Tetra but is related to the Carp Family. The species is very hardy, eats anything, is peaceful but has never been bred. *Exocoetis danicus* is well known; it closely resembles *Rasbora daniconius* in general colouring and shape but has longer fins and the characteristic long barbels. It is fast-moving, extremely hardy, easily bred and peaceful but not greatly attractive.

The Snakeheads, represented by three species, are, together with the Catfish and Eels, capable of hibernating in moist mud over a period of drought, to almost the same degree as the African Lungfish. All the others perish in total drought but can survive in incredibly foul and concentrated waters till the rains come, living on a starvation diet and often breathing air from the surface.

The temperature range for dry-zone fishes is from 75 to 95 deg. F. and occasionally even higher. They can withstand pH variations from 6.5 to 7.2 but more gradually. Overcrowding them does not present very great risks. They eat almost anything alive or dead but prefer live food.

The Gobius, Catfish and Snakeheads, as well as the larger Barbs, prefer live, small fishes or even dead ones. The Labeos eat algae and the Giant Gourami feeds on aquatic vegetation, jungle fruits and flowers. Small insects and insect larvae form the diet of the smaller Barbs. Cannibalism is common.

Blue-tongued and Stump-tailed Skinks

by ROBERT BUSTARD

THE Blue-tongued Skink is one of the largest of its group, adults measuring between 18 and 24 in. in total length. The tail accounts for only about a quarter of this length or a third at the most. Its body is elongated and the head large.

As can be seen from the photograph this lizard, like the Stump-tailed Skink, has very small limbs in relation to its size. This feature is characteristic of the *Scincidae*, many members of which are totally limbless. The

coloration is variable, consisting of dark brown or black markings on a pale or dark grey, or even yellow-brown, ground colour. The ventral surface can be greyish, whitish or pale brown and not infrequently it is tinged with salmon pink.

In my opinion the more attractive specimens are those offering the most contrast, being pale grey with dark black markings. As can be seen from the photograph this colour arrangement can be very pleasing.

The Blue-tongued Skink is one of the best-rated lizards I know. I always have several in the collection—they live for many years and become very friendly.

Young specimens are sometimes rather "wild"—they puff themselves up, opening their mouths and hissing—but they very soon become tame. They are intelligent lizards, easily won over by a piece of ripe banana or a strip of raw meat which they will eagerly accept from the fingers.

Their huge blue tongue (from which they derive their common name) is much in

fat and lazy (if well cared for) to pursue such small food and their small legs and heavy bodies do not make them very agile.

They have a sweet tooth and like any ripe fruit; they are especially fond of banana. My largest Blue-tongue (23 in.) consumes a whole banana at one meal. They are also fond of raw meat which should be cut into strips for them.

I feed my specimens every other day, and one should not worry if they go off their food occasionally, especially during the Winter months.

Right: Blue-tongued Skink (*Tiliqua scincoides*), a long-lived species, in the vivarium. Robert Bustard photograph.



Left: Stump-tailed Skink (*Trachysaurus rugosus*), another lizard that is recommended for beginners to lizard keeping.

evidence when the lizard is feeding or drinking. This species is strongly recommended for its hardiness and docility and it is a firm favourite among collectors.

The sturdy Stump-tailed Skink reaches a total length of 12 to 13 in. Its tail is very short and fat, and the creature is covered by thick scales so that it resembles a long fir cone. The general appearance is clearly shown in the photograph.

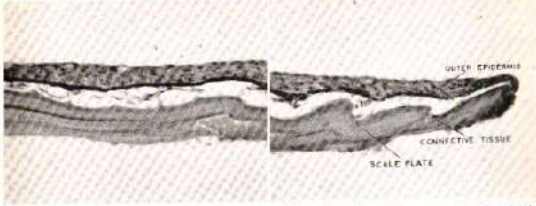
I strongly recommend this species also, and both it and the Blue-tongue make ideal introductions for the beginner to the keeping of sub-tropical reptiles.

The following remarks on feeding and housing apply equally to the Blue-tongued Skink, which lives well in company with the Stump-tail. Young specimens will accept the usual animal food—gentles, Earthworm mealworms, etc., but adults are generally too

The vivarium should have a good depth (about 3 in.) of sand on the bottom. A water dish must be present at all times as they drink considerable quantities. I provide hiding places made out of slabs of log and pieces of bark nailed together. In these warm, dry conditions many species of cacti flourish and, if the sturdier species are planted, the vivarium can be made very attractive indeed.

Easy to Keep

These large Skinks are costly to purchase initially, but I have found that, in the long run, they are much cheaper than smaller lizards. This is because, if kept in the simple surroundings described and provided with adequate warmth—75-80 deg. F. by day and 50-60 deg. F. at night—they are very hardy and will live for many years. They quickly get to know their owner and become very friendly.



Cross-sections of the skin and scale from a non-parental Pompadour Fish. Left—centre of scale and right shows the scale tip.

BREEDING POMPADOUR FISH

What the microscope reveals

by ROY & GWEN SKIPPER

IN our last article on breeding Pompadour Fish (*Stiphodon discus*), which appeared in the April 1957 issue, we told of the help given by Dr. Gwynne Yevers, M.B.E. and Dr. W. H. Hildemann in furthering our research work.

We then described the amazing difference seen when the scales of the brood parent (i.e. when the young were feeding from their parents' bodies) and non-brood parent were compared under a high-power microscope.

Scales were sectioned by Dr. Hildemann and several dozen slides were made. These were photographed; the results were highly

successful and comparative photomicrographs are here shown with Dr. Hildemann's comments:—

"As histological sections go, these are first-rate. Especially note the abundance of large mucous cells (epidermis) and hyperplastic dermis of the parental fish skin.

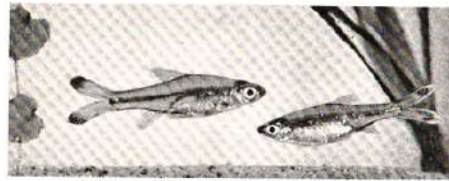
"In contrast, the resting state of the non-parental skin reveals a thin dermis with fewer and just inconspicuous, smaller, mucous cells in the outer epidermis. The underlying layers are connective tissue and finally the scale plate which consists of long, parallel, collagenous fibres and is acellular."



Cross-sections of the skin and scale from a parental Pompadour Fish. Left—centre of scale and right shows the tip of the scale.

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The Scissortail (*Rasbora trilineata*), a medium-sized species.

VARIATION AMONG THE RASBORAS

Distinctive tropical fishes of widely differing size and appearance

By D. B. McINERNEY

FISHES in the *Rasbora* Genus differ considerably, and it is not surprising that a beginner can hardly believe that a Harlequin Fish is closely related to *Rasbora elegans* as their size, coloration and habits vary so much. It is not possible to describe one method of breeding to cover all the species but, by dealing with them in groups, I hope to be able to give a fairly comprehensive guide, that will get over the main difficulties.

Thus I shall divide the Rasboras into three groups:—(a) large, (b) medium and (c) small. The large Rasboras are not very popular for, besides growing too big for the average aquarium, they are fast swimmers, and need ample space for their ceaseless movements. In colour many are similar, having a greyish body. A continuous black line runs from the gill plate to the tail, and this frequently bordered above by another narrower line of gold. One exception is *R. elegans*; though not particularly elegant, the body is adorned by a blue-black rectangle in the centre of the flanks, and a smaller one on the peduncle.

These larger Rasboras are not greatly in demand, but those wishing to breed them will find that they prefer a large tank and one 40x15x12 in. should be fitted with 3 rain-water and 1 tap water; pH and hardness need not be very closely watched. The tank must be well planted, and contain some clumps of *Microphyllum* or *Cabomba*.

Usually the following morning the male will

drive the female near these plants and when sufficiently excited, the pair press against each other and the fertilized eggs are scattered.

On some occasions I have witnessed both fish close to the sand in a front corner of the tank, here they press close to each other and, with the pair trembling slightly, the eggs are laid and fertilised. The current in the water made by the fishes waving their tails drives all the eggs across the front of the tank, and they pile up in quite a mound in the opposite front corner.

Large Spawners

Spawners can be enormous and, though quite a few eggs may fungus, ample will hatch out in a further two days. The parents having been removed after spawning, the great number of fry will require plenty of Infusoria if all are to receive adequate rations. They are

L. E. Perkins photograph of *Rasbora elegans*.



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not difficult to raise, and will be 1 in. long in three weeks.

Before going on to the more interesting medium group, I must mention the Scissortail (*R. trilineata*). Though this fish will grow to 8 in. long in Nature, it is not included in the "large" classification as aquarium specimens rarely exceed 3 1/2 in. and will often breed at 2 in. This species is popular, and there is a ready market for all that can be raised. Spawners can be large; I know of one instance when 4,000 youngsters were brought to saleable size. Though not brilliantly coloured, *R. trilineata* has a nice, streamlined shape, and a good disposition, but perhaps the popular name of Scissortail has done most to increase the demand; certainly the black coloration in the upper and lower lobes of the tail do catch the eye as the fish swims, and the opening and closing scissor action is pleasing.

When breeding Scissortails of 2 in. size, our standard 24x8x8 in. tank is quite large

pair, pressing their flanks closely together, will tremble as spawning takes place.

The eggs are difficult to see among the mass of plant leaves but, if the parents are well fed, they do not seem very inclined to eat them. After spawning, remove the adults and wait.

The eggs hatch in two to three days, and the small fry will require Infusoria as soon as they are free swimming. After one week they will accept newly-hatched Brine Shrimps. Once on to Mikro-worms they are out of danger. *R. borapetensis* is quite popular and is about the easiest of the medium-sized fish to breed, but *R. paucispinosa*, when kept under ideal conditions in soft, brown water, can rival a Neon Tetra in brilliance. The bright red line running the length of the flanks glows so brightly that it almost seems to draw out one's eyes. *R. doravireolata* is a pretty, silver fish, with glistening green eyes, and the black spot in the dorsal fin is most striking when a shoal of these fish is seen together.



Rasbora borapetensis, a species relatively new to aquarists. R. Skipper photograph.

enough. Eggs are scattered as described for the larger species.

Among the medium-sized Rasboras, I include *R. boopisoma* (which, incidentally, derives its name from the Boapee river in Thailand, where the fish is commonly found), *R. leptosoma*, *R. paucispinosa*, and *R. dorsivireolata*. These four species are more difficult to induce to spawn; they require soft water, of approximately 20 p.p.m., and a pH of about 6.0. Our standard 24x8x8 in. tank is ideal for size, no sand is required, but it should contain many half-submerged Cryptocorynes, and the temperature set at 80 deg.F. Now introduce a well-conditioned pair of fish, but do not be too disappointed if they show no interest in each other immediately. They are usually rather scared and it may be quite a week before they settle down and gain confidence.

Eventually the male will follow the female about, pushing through the plants to contact her. If all goes well he will excite her and the

Finally we come to the small Rasboras; these are the most popular of all and include such species as *R. heteromorpha*, *R. maculata*, *R. unopthalmus*, and *R. reticulatus*. All are beautiful, and none is as long bodied as the large or medium-sized species, indeed Harlequins and Fire Rasboras are more like a Flame Fish in shape, being almost as deep as they are long. Thus many more can be kept in a small tank and, not being such speed-fish, are more restful to watch.

To breed *R. maculata* and *R. unopthalmus*, only a tiny tank is necessary. I have had great success in an ordinary battery jar about 6 in. by 5 in., but even a plastic sandwich box is large enough. Best of all I find is to use our standard 24x8x8 in. tank, but to divide this in half by a piece of slate tile cut to size, and wedged with channel rubber. Now either two pairs of one species can be spawned in each section, or one pair of both species placed on either side.

The breeding receptacle, be it battery jar,

sandwich box, or divided tank can be quite bare. Fill to a depth of 4 in. with extremely soft, brown, peaty water at a low pH, so that it is on the acid side of the scale.

I have bred these fishes in water of a pH of 6.8 and in many lower stages right down to 4.0, so I am convinced that, so long as the water is not alkaline, the actual pH is immaterial.

Now drop into the water a freshly boiled nylon mop (explained in my October article) and allow this to lie sideways on the bottom. Fix the temperature at 80 deg.F. and place in the selected pair or pairs. As with the medium-sized Rasboras, spawning may not take place next day, or even for four or five days according to the condition of the fish and how soon they settle down.

With *R. maculata* there is a curious mating that I have never seen with any other fish. The male will close to the side of the female and then curl the end portion of his body (i.e. his tail and most of the caudal peduncle) over and round the same part of his mate. Thus temporarily locked, the pair tremble violently, when the fertilized eggs can be seen falling through the water. If this action takes place on the bottom of the tank, the tiny eggs can be seen as they swirl around in the water current set up by the shimmering fish.

Another Technique

R. arophthalmus spawns above the mop, and the male does not wrap its body round the female as just described but merely makes very close contact with the lower flanks and sides of the belly.

R. heteromorpha likes much the same water, but prefers a planted tank. Here the female, when sufficiently excited by the male's constant attention, finally turns upside down under a *Cryptocoryne* leaf lying horizontally in the water; the male follows and also turns upside down. In this position the eggs are laid, fertilized, and left adhering to the underside of the leaf. One or two may fall but most seem to stay put.

The belief is widespread that Harlequins are communal spawners and, to be successful, three or four pairs must be used at once. This may be so in Nature where all the fish come into condition together, but is hard to achieve in aquaria. In my experience when spawned communally, one pair will start to spawn and the rest will promptly devour all the eggs as fast as they are laid.

I now only use one pair at a time, and quite often get good results. I have not yet spawned *R. variciflavis* but, from their shape and the fact that they seem happy under similar conditions, it may prove that breeding will be achieved one day using the Harlequin method.

WINTER IN THE WATER GARDEN

Ensuring colour all the year round in the pond area

by J. STOTT

A WATER garden can look drab and colourless in the Winter season unless steps are taken to overcome this by including in the planting scheme subjects which provide bloom or foliage at that time of the year.

The Autumn colour should be stretched out as long as possible by using these plants which bloom in the very late Autumn. We must remember that a few of those shrubs which have coloured berries are in the habit of carrying them well into the Winter and, therefore, are useful aids to brightening Winter's gloom if introduced to the background of the surround.

There are a few plants that are late Winter-flowering and some of these may be introduced into the near vicinity of the waterside if the right conditions are made for them. The early Spring bulbs should also never be overlooked.

Useful Evergreens

Evergreens perform a useful service for they really come into their own during the Winter months when the competition from colourful flowers and other foliage effects is no longer there. This is one of the reasons why some of these plants should always be included in the planting scheme of every water garden.

Even quite a small set-up will benefit from the inclusion of one or two suitably-sized evergreens such as one of the miniature conifers, *Juniperus communis compressa* or the small Cupressus, *Chamaecyparis obtusa nana*. If the soil is of a peaty nature, *Azalea ardens* not only provides attractive green leaves during the Winter but, of course, blooms in May.

Some of the smaller, variegated Conifers with their gold or yellow leaves look well as a contrast to the green and grey-green varieties, especially if they form background planting to the water garden. *Chamaecyparis pfitzeri filifera aurea* is an ideal subject for such a position and will eventually achieve a maximum height of

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One of the loveliest Dwarf Irises—*Iris reticulata*—which flowers in the late Winter and is sweetly scented.



anything from some four to five feet. For something providing a little more height, say about seven to eight feet, *Thuja Rheingold* is a pleasing evergreen which, in Winter, will bring a lovely golden-bronze colour to the water garden.

Where a few Conifers form the background to the pool and waterways the ground around them is an ideal position for planting some of the early flowering crocuses such as *C. imperati*, *C. saxianus* and *C. sibirici*. Certain of the Winter-flowering Primulas can occupy part of the same site and of these *P. edgeworthii* and *P. gracilipes* must be recommended with, for parts of the rock surround, the old favourites *P. venula* and *P. juliana*.

One or two clumps of the Carnea varieties of European Heather in the rock surround will also help to provide added interest in Winter. *Erica carnea gracilis* vars. Queen Mary and Springwood White are good for this purpose because they are not so particular about soil conditions as some other species of heather.

There may be a place in the rock garden surround where one or two dwarf flowering shrubs could be planted. If so, there are several species which can be usefully employed as providers of Winter colour. *Daphne mezereum* is one of these, eventually reaching a height of around four feet and offering purple flowers in February, followed by red berries.

For a damp situation in the higher reaches of the bog area in the water garden the Polypody evergreen fern (*Polypodium vulgare*) will remain attractive during the Winter as will the Hart's Tongue Fern if planted in some position where rock meets water.

Two of the dwarf Irises qualify to be included among the "winter flowering subjects". The earliest to bloom of the two is usually *I.ibirica* *major*, but it is quickly followed by *I. reticulata*. Both will do quite well at the base of a south-facing rock slope. Another Winter Iris is *I. angustata*, which will be happy in a similar position but, as it is not a dwarf, it should be given more space.

For a damp situation in the higher reaches of the bog area in the water garden the Polypody evergreen fern (*Polypodium vulgare*) will remain attractive during the Winter as will the Hart's Tongue Fern if planted in some position where rock meets water.

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The Springwood White variety of *Erica carnea*, an early succumbent Winter-flowering heather variety. J. E. Downward photographs.

OCTOPUSES AND CUTTLEFISH

by J. S. VINDEN

THE last group of molluscs for us to consider are the highly intelligent *Cephalopoda* or "head-footed" animals. This group includes the octopuses, cuttles and squids, apart from more exotic animals. Nobody without previous knowledge of the subject would imagine that the highly-intelligent, sharp-sighted, mobile octopus was related to the shall we say, somnolent oyster, but such is the case, for both are truly molluscs.

I think, with few exceptions, it is the secret or openly expressed desire of all marine aquarists to keep an octopus! The octopus is a much maligned animal, and the feeling of revulsion that some people have for them is, I feel, inspired by stories read in childhood of this horrible "devil fish".

Any octopus found in British waters, at least, will escape from man as soon as he can manage to, and the only creatures that need fear him are fish and crabs! What are his possibilities as a home aquarium animal? Alas, I feel that the difficulties are almost insurmountable. Gosse kept one when he lived in Devon, and I have seen one on a trade stand at an inland aquarium show. London, Brighton, Plymouth and other public aquaria have kept them with varying degrees of success.

To keep an octopus for more than a day or so one would need a very large tank of good glass, a minimum capacity of 300 gallons. One would also need a regular supply of live fish and crabs of a suitable size and a circulating and aeration system plus, of course, a healthy, living octopus!

Although the octopus can be classed as a shore animal, owing to the fact that it may occasionally be found in cranias at low tide on our coasts, its powers of disguise render it virtually invisible, and the chances of catching it are remote indeed.

We have two species of octopus on our coasts. *Octopus vulgaris*, the Common Octopus, is found on the South and is characterised by having long arms with two rows of suckers on them. *Mitichites (Eledone) curvata*, which occurs in more northern waters, is in fact more common than the "Common" Octopus and is abundant off Scotland. This animal has shorter arms and has but a single row of suckers on each of its eight arms.

The rest of the cephalopods have not eight, but ten arms, two of which have a different

shape from the others and are called tentacles. When shrimping one may catch the delightful little sepiote, *Sepiopsis atlantica*. It is barely two inches long and so may be kept in a moderately-sized tank. I myself have not yet kept it but intend to try as soon as I can get some specimens.

Gosse says of it: "Its beauty, sprightliness, and curious habits have made it quite a favourite pet among the denizens of my aquarium". It feeds on small shrimps and, should these be obtainable, one might be successful with this pocket relative of the devil-fish.

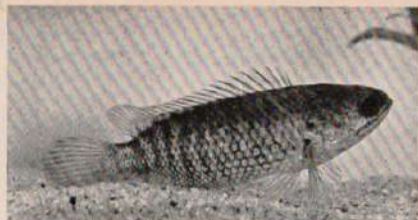
The other exception is the Common Cuttle,



A Cuttlefish with arms protruding from its mouth. Photograph by Douglas P. Wilson, F.R.P.S.

Sepia officinalis, the cuttle from which the pigment, sepia, is obtained, and also the cuttlefish bone which is given to cage birds, and is used in dentifrices as a polishing agent. While I do not suggest that it is possible to keep the idyllic animal in home aquaria, its eggs may sometimes be found attached to seaweed during July and August. Kept in a well-aerated tank some of these "sea-grapes" may hatch and you will be rewarded with a batch of miniature cuttles complete with ink!

The molluscs, as a whole, are a difficult group for the aquarist and, while experiments may be made with many species, I am inclined to think that the average marine aquarist is wise to confine himself to a few well-tried species that are known to thrive under aquarium conditions.



Climbing Perch resting on the gravel of an aquarium.

Climbing Perch—the Fish with a Wanderlust

by DIANE SCHOFIELD

MOST of the common aquarium fish are only too happy to stay in whatever tank the aquarist places them, but not the Climbing Perch (*Anabas testudineus*). Climbing Perch are air-breathers and come into the *Anabantidae* Family.

Anabas is derived from the Dravidian language of India and Ceylon and means, "the climber". The second part of the name, "testudineus", means "resembling a tortoise shell". This possibly has reference to the tough exterior of the Climbing Perch.

This tough exterior, together with the auxiliary air-breathing organs, enables *Anabas testudineus* to journey from one pond to another in search of food. The fish are able to do this by extending bony plates or spines which protrude from their gill-plates. These spines are dug into the ground with each movement that the fish makes and locomotion is accomplished by hitching and wriggling along. They can attain a surprising speed by this method.

Protective Colouring

During these sojourns between ponds they are vulnerable to attack by all manner of land animals, so Nature has equipped them with a dirty-shaded protective colouring. This colour is only a little lighter toward the belly and the fins are drab to hazel.

Since Climbing Perch are found in the turbid

waters of canals, ditches and swamps as well as in lakes and ponds, the brownish-grey colour serves them well, making them almost invisible.

Used as Food

Not the least of the Climbing Perch's predatory land animals is man. In Ceylon, India, Malaya, Siam, Southern China, the Philippines and the Indo-Australian Archipelago where the Climbing Perch abounds, they are caught and sold as a staple food fish. So that the fish-peddler's customers may buy their fish really fresh, the Climbing Perch is carried from customer to customer. If the fish is lucky, it may receive an occasional sprinkling of water. If business is slow it may be kept out of water for the next day.

With its surroundings being kept moist the Climbing Perch can survive for several days. This is possible since it is dependent on its gills only to a very slight degree. The auxiliary breathing mechanism is more highly developed than other members of the Family, *Anabantidae*. The mechanism is used both when the fish is in the air breathing atmospheric oxygen and as an aid to respiration when the fish is submerged.

In common with other members of its Family, the Climbing Perch will drown if a covering is put on the top of the water so that it cannot reach the surface for a breath of air. It cannot survive on the amount of oxygen obtained

through its gills alone, but with the two breathing arrangements working together, it can live in unbelievably thin water and thrive in temperatures up to 98 deg. F., when most of the available oxygen for other fish is drawn out. On the other hand *Anabas testudineus* will do well down to 65 deg. F.

Although the colouring of the Climbing Perch may not sound very attractive they are, nevertheless, rather distinctive fish. Theirs is not the streamlined shape of most fish, instead the head is the same width as the body and rounded to a blunt end. There is a large mouth that curves in a very unfishlike smile at the front of the head.

Generally Carnivorous

Naturally, with such a large mouth, the Climbing Perch should not be put in with fish that could conceivably fit into such a mouth since the Climbing Perch is largely carnivorous. Any of the meaty foods such as Earthworms, White Worms, mealworms, or small pieces of beef or liver will suit its appetite very well indeed.

It can be taught to eat the larger sizes of dried foods but it will not thrive on a diet of these alone. It is not in the least herbivorous and your choice aquarium plants will be safe with *Anabas testudineus*.

One precaution should be observed at all times in their tanks—the top should have no available openings since the Climbing Perch will take advantage of them for extra-carriaculid profits. It does not take cognizance of the fact that it is in a tank and that there is not another pond just around the bend of the road to which it can walk.

Tolerant Species

Anabas testudineus seem to be an amazingly hardy and healthy fish. I have had a trio (a male and two females) for the past five years. In this time they have not had the slightest indisposition. Although their tank mates have occasionally been plagued by White Spot, the small parasites were apparently unable to gain a foothold in the tough leathery hides of the Climbing Perch. The females have reached a length of eight inches but the males are two inches shorter. Whether this is a characteristic of the male or an abnormality of this particular fish I could not say.

The females are distinguished by their rounded abdomen and a thicker caudal peduncle. The male has a longer and more pointed dorsal fin.

Since the Climbing Perch are such a curiosity to most aquarists, my husband and I have taken them around to most of the aquarium societies in our area. After a short talk, my

husband places them on a specially constructed board so that they will put on a climbing exhibition. The board has been painted with shellac and then covered with dirt before the shellac could dry. This gives them good traction for their bony gill plates and they walk right along, to the delight of the clubmembers. They are kept out of water for at least an hour each time and are none the worse for it.

Rarely Brood in Aquaria

Unfortunately there seems to be a necessary element missing in their tank life when it comes to spawning. Rarely have the Climbing Perch been spawned. Those who have seen them spawn say that there is no bubble-nest as most other Labyrinth build; instead the eggs float free until they hatch in about 24 hours. The parents take no part in blowing the eggs or caring for the babies in any way. The fry hang at the surface until their egg sac is absorbed and then assume the usual parallel position.

If it is ever possible to purchase one of these fish, do not fail to do so. No other aquarium species can provide you with so much entertainment over such a long period of time.



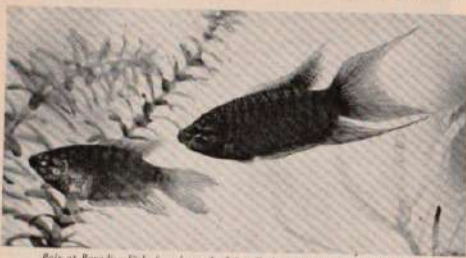
The Climbing Perch (*Anabas testudineus*) emerges from the water for a breath of atmospheric air.

Long-lived Paradise Fish

W. E. CLAPINSON of London, S.W.17, has a Paradise Fish (*Micropodus opercularis*), now in its eighteenth year. It still retains full colouring and, despite being kept in a coldwater tank in a greenhouse, even in 1958 it built a bubble-nest.

The fish was exhibited at a National Aquarists' Society's show some six years ago.

BUSY SEASON FOR FISH IMPORTERS



Pair of Paradise Fish, female to the left. G. J. M. Timmermans photograph.

P. MILLET gives a selection from the tropical species among recent arrivals

THE last few weeks have been busy ones from the point of view of our importers, for not only has the seasonal rush in the commoner tropical fishes begun, but conditions have been favourable for the bulk import of wild fishes from the East, and elsewhere.

So many species and varieties of Labyrinth fishes have arrived that I am almost tempted to call this "Ahabamid month"! Rarely is it possible to buy such a wide range of these fishes at one time. Before dealing with the individual species, a few remarks about the group, as a whole, may be out of place.

These fishes have, in addition to ordinary gills, accessory breathing organs that resemble primitive lungs, and all the species come to the surface of the water occasionally to "take a breath of fresh air".

Varying Development

The development of these organs varies with the species. It is simplest in the Indian Paradise Fish (*Macropodus opercularis*) and most highly developed in the Climbing Perch (*Tetraodon lineatus*) and in the *Ctenopoma* African fishes.

The possession of the labyrinth organs leads to one special requirement of these species that is sometimes forgotten by even experienced aquarists. This is that the air above the water should be humid, and as warm as the water itself. These conditions are easily provided so

long as a tight-fitting cover glass is always on the tank.

Should a tank be kept in a draughty position with no cover glass, the fish would probably suffer as a result. This applies particularly to the Chocolate Gourami (*Sphaerichthys coelestis*), for many specimens of this more plentiful fish have been lost through the neglect of this simple precaution.

Provide Best Conditions

There is another point about these fishes that is worth stressing. Many people seem to think that, because they have accessory breathing organs, they can be kept in foul water, and grossly overcrowded. While this is true to a certain extent, it is not a practice to be recommended, and nearly all the species will do better if kept in clean, old water and provided with plenty of space. The fry also require a lot of room if it is desired to rear them successfully and grow them on fast.

The nest-building habits of these species are too well known to describe here, though one or two of the fish are mouthbrooders.

Present imports include the well-known common Paradise Fish (*Macropodus opercularis*). While not a community fish for the small aquarium it is a most beautiful creature when seen at its best, and is well worth keeping with fishes around its own size. It has the

distinction of being the first tropical fish ever to have been imported to Europe alive.

Also on the market are true Albino Paradise Fish. This variety, which was first introduced about 25 years ago, is cream coloured with pale pink vertical bars. Its eyes, like those of all true albinos, are also pink. It has little of the aggressive behaviour of the ordinary Paradise, and can be kept with other gentle fishes of suitable size. It breeds true.

Two other Paradise Fish are also available at the moment: the Black Paradise (*M. concolor*), which has already been dealt with in these articles, and the Round-tailed Chinese Paradise Fish (*M. chinensis*). This latter fish, which only reaches a length of 2½ in., is rarely seen, though it is easily bred. The body is russet with darkish bars on the sides, and the reddish fins have dark edges. It is easily distinguished from the common Paradise, for its tail is rounded. It breeds in the normal manner of Paradise Fish, but is not quite so prolific.

Variety of Gouramis

Gouramis of various sorts are in good supply, and I have seen some exceptionally good dwarfs, *Coleus lalia*. While a common fish, it is not always seen at its best and, for sheer beauty and colour, a male in good condition is hard to beat. Opaline or Cosby Gouramis seem to be more plentiful, and are rather more attractive than their ancestor, *Trichogaster trichopterus*.

Also included in recent imports are some more Chocolate Gouramis. While this fish has not proved easy to every aquarist, it should do well if kept at a fairly high temperature in clean, old, peaty water, provided that one always remembers its special requirement of a moist, warm atmosphere.

Of the larger species I have seen both the

Kissing Gourami (*Helostoma temminckii*) and the Snakeskin Gourami (*Trichogaster pectoralis*). The former can eventually reach a length of one foot under suitable conditions, but is not likely to do so in the home aquarium. Its kissing habits make it an amusing fish, and its colour, or rather lack of it, makes it a good foil for darker-coloured fish. It needs frequent feeding to keep it in good condition. Large specimens are not to be treated with small fish. Most specimens will eat dried food.

Sexing Difficult

The fish usually seen is a pinkish variety of *H. temminckii*, and it is sometimes known as *H. temminckii* var. *radfordi*. Kissing Gouramis are impossible to sex until they are over five inches in length and, owing to the size of adults, breeding is best left to the specialist, though it can be achieved by those with really ample space.

The Snakeskin Gourami is a comparative newcomer and, in Nature, attains a length of up to 10 inches. In spite of this it has perfect aquarium manners like its cousin *Trichogaster leeri*, and is perfectly safe in the community tank. While it is not a brilliantly coloured species it is attractive and very prettily marked. The fins of the males are slightly longer than those of the females.

Breeders who are successful with *T. leeri* may be tempted to try their hand with this species which breeds in the same way and is said, by some, to be no more difficult.

Among unusual labyrinths, I have seen a few specimens of *Ctenopoma fasciata* and some Black Fighters. The *Ctenopoma* is not the sort of fish that sells itself on sight, but is an interesting African Labyrinth for the aquarist who likes the unusual.

Black Fighters are blacker than they were a few years ago! They are certainly attractive



Gene Wolfheimer photograph of two Kissing Gouramis (*Helostoma temminckii*).

and, owing to their present scarcity, should be well worth breeding.

Dwarf Cichlids

Last month I mentioned that some new Dwarf Cichlids were expected. At the time of writing one of these has arrived and is, at present, offered as *Pelmatochromis* species. It has not yet developed its colour but, even at this stage, one can see that it is "different".

Some months ago I described a new un-

named Characin which resembled a Beacon Fish with an extra ocellus. It is now in better supply and is being offered by the trade as *Hemigrammus ocellifer ocellifer*. While this name describes the fish perfectly, I have not yet seen it in the literature, so I feel that possibly it is not its true scientific name. However, the fish offered under that title is an attractive addition to an already good list of small, well-coloured Characins to include in the community tank.

to Beccari's plants, among them the *Cryptocorynes*.

In 1879 Engler published, in an Italian horticultural periodical, the description of *Cryptocoryne longicauda*, which he had copied from Beccari's notes or, rather, he made the description from a drawing of the inflorescence found in Beccari's papers, and from some jottings concerning the leaves made by Beccari when he found the plant in Sarawak. Beccari added some comments to the effect that he had been unable to preserve a specimen. That was all.

No Rediscovery

Later on Beccari's drawing was published (1882) but nobody was able to add any more data to the scant information given and there seemed to be no collector who succeeded in rediscovering the plant.

In 1952 the Botanic Gardens at Bogor (formerly Buitenzorg), Java, Indonesia, sent me, for trial in aquaria, all the living *Cryptocorynes* available. Among them were five specimens of an unknown species grown for many years in the Gardens. The plants had been gathered by a Dutch expedition into Borneo.

These plants were successfully introduced to Holland. They are now becoming increasingly popular on the Continent and I have seen fine specimens grown by English aquarists as well. I tried to name this species but the leaves of *Cryptocoryne* are so variable that, unless one is thoroughly familiar with the species beforehand, it is often hardly possible to identify a plant with certainty until flowers are produced.

Very fortunately, a Dutch aquarist, Mr. W. Yeldhuizen, succeeded in obtaining several flowers and then I was able to establish the identity of our plant:—*Cryptocoryne longicauda* Becc. et Engler.

It was a fine example of the valuable help the aquarium hobby can give to solve puzzles in plant systematics. A full description could then be made and a beautiful plant was added to the aquatics suitable for aquarium purposes.

Rules to Follow

Cultivation is easy but some rules have to be closely observed. First of all, never expose your *Cryptocoryne longicauda* to direct sunlight and, if possible, guard against direct daylight entirely. An aquarium that receives its light from electric bulbs, or only fluorescent lighting, is entirely suitable. Secondly, give it ample space. All other plants should be kept at a distance of four or five inches. In dim light and with plenty of space, the deep green leaves will develop beautifully and rapidly.

A good number of well-developed *Cryptocoryne longicauda* specimens in the middle of the aquarium, either along the sides or in the centre of the tank, makes a fine display.

For Your Bookshelf

Snakes as Pets*

DR. HOBART M. SMITH sets the tone of this excellent little book with these words, "Snakes are the world's most exciting safe pets," and goes on, "let us warn you never to experiment with snakes of unknown species". In other words, one might say, treat all snakes with respect, but once you know your pet go ahead and learn all you can from it.

Here is a book which tells a would-be snake owner how to set about this pleasing, what snags to avoid, how to care for this wonderfully clean animal, and what to feed it on.

There is a useful key to identifying all the non-venomous snakes of the United States, and the bibliography at the end will be most handy for further reading.—A.G.L.

* By Hobart M. Smith. 80 pages, 24 illustrations. All-Pets Book Inc. \$1.25.

CRYPTOCORYNE LONGICAUDA



Overhead view of a flowering *Cryptocoryne longicauda* plant.

A plant which dislikes direct sunlight but needs ample growing space

by Dr. H. C. De WIT

THE great island of Borneo is the natural haunt of many attractive species of *Cryptocoryne*. Some of them are also found in the Malay Peninsula or on Sumatra but the majority are confined to Borneo. Quite a number are insufficiently known and a few, I may add, are still undescovered. One of these puzzling species was *Cryptocoryne longicauda* Becc. et Engler.

Odoardo Beccari was an excellent explorer and plant-collector. He was an Italian who

travelled for many years in the second half of the nineteenth century in numerous parts of tropical Asia and secured (e.g. from Borneo) exceptionally fine collections of forest plants.

The *Araceae* which he brought to Europe were elaborated by Professor Engler, the most distinguished and extremely successful director of the Berlin Botanical Gardens at Dahlem (1889-1921). Engler published large monographs of the *Araceae* Family and in some smaller publications also paid special attention



Cryptocoryne longicauda. a—flowering plant, b—flower just before opening, c—the opened kettle of the flower, and d—a stigma.



The Editor does not necessarily share the views of correspondents

Breeding Daphnia

Sir—In your July issue was printed an article by Dr. F. N. Gladstone on the keeping of Daphnia and I thought you would be interested in the method I adopt.

Two years ago I started with a small quantity of Daphnia which was put in a small tank (18 x 8 x 3 in.). There is no ventilation in the tank and no plant life, only two inches of gravel covering the bottom. The tank stands on a window ledge in an out-house with a window above the tank.

I feed the Daphnia on a dried lettuce leaf during the Summer and a solution of yeast during the Winter. On this diet they continue to multiply. It is interesting to note that during the Winter months the tank is often covered with ice and during this period the Daphnia are not to be seen. From this culture I can get a generous helping once a week for my 14 fishes. I believe that what can be achieved in a small tank can surely be done just as successfully in a larger tank of pond. The water in this district is very soft.

Blackburn, Lancs. A. KIMBLEY.

More about Pike

Sir—I should like to add to the "Opinions on Pike" of E. G. Green and John Waterfield (Fishkeeping, October, 1958, Readers' Views). During Vinney's Legends, page 241 in the North Report of the Biological Bureau (1951-52), Province of Quebec Dept. of Game and Fisheries, regarding *Esox masquinongy*.

"According to the usage now established by the University of Toronto that also adheres to a communication made in 1922 by E. T. D. Chambers to the American Fisheries Society: The masquinongy is a question of nomenclature, Trans. Amer. Fish. Soc., 1923, pages 171-177. The English spelling of the vernacular name of this fish is 'masquingone' that is to say, the name as in French except for the accent (Masquinongy), this name being derived, in fact, from the Indian language of Canada; it appears that it means 'Great pike' in the sense of 'imposing pike'. The roots of the word, according to a specialist in Indian languages, Dr. Jacques Roussieu, Director of the Botanical Garden of Montreal, are probably Algonquin: *masuk*, muskoka, great, and *inok*, big fish."

The Concise Oxford Dictionary (4th edition) lists only "masquinongy", as does Vinney's Legends in *The Freshwater Fishes*, Volume 1:

"Key to Game and Commercial Fishes of the Province of Quebec." There is also a theory that "masquellings" in its many spellings (masquellange; and some old ones masquellang; masquimpe) is derived from old French "masque elongue", meaning long or elongated "mask"—face or snout.

However, the theory that these are merely further corruptions of "masquingone" may be borne out by the lack of definite pronunciation or spelling and by my observation that "masquellang" tends to be more used in English vernacular and "masquinongy" in French, whereas the opposite would likely be true if "masquellang" was of French derivation. Anyhow, it seems to be certain that its origin is aboriginal North American.

The terms "Northern" and "Great Northern" as applied to Pike (*Esox lucius*) were invented by sportsmen and commercial interests in the northern United States and Canada to popularize the Pike as a game fish in those regions. Actually, the one species, with no known subspecies, is the same everywhere in North America, so far as studies to date are concerned. Work is in progress to verify this.

Montreal, Canada. JOHN C. REID.

Lace Leaf Plants

Sir—We read with interest the excellent article by Diane Schofield on the Madagascan Lace Leaf Plant in your October issue and would like to report a personal experience which is considerably at variance with that of Mrs. Schofield.

The rhizome of a Lace plant was purchased early this year and planted in a small tank (only 18 x 9 in.). There were no special preparations except that the water was purposely kept in a slightly acid condition by a block of peat for the spawning of White Clouds and it received average light and air.

At first the new arrival did not give any signs of liking the tank conditions, the first two or three leaves being small and the veins so close together that they could not be described as lace. However, the subsequent leaves were up to 4 in. in length and 1 1/2 in. in width, resulting in a beautiful but rather small plant.

Eventually we were pleased to observe a flower spike coming up from the plant but were rather speculative as to the possibility of pollinating the flower and obtaining some seeds in view of the accounts we had read which told us this just did not happen.

Our hopes were further dashed when the double-headed spike produced some dirty white flowers which still lay below the surface but, as time progressed, we noticed what seemed to be minute seed pods of the usual *Apogonon* shape. After about three more weeks one of the heads broke off and eventually seemed to disintegrate, apparently through the seed pods becoming ripe, so we focused our attention on the other half with very little hope left.

Another two weeks elapsed without our paying much more than routine attention to the tank but then we were surprised to see a minute plant with two leaves not more than 1/4 in. long and 1/8 in. wide attached to a seed not much bigger

than two pin heads. Detailed attention to the tank was called for and together we can trace up to two dozen small seedlings at the present time.

The other head of the spike was observed more closely and only two days ago, without breaking off, it released some seed pods, one of which was opened to reveal a seed which again was no longer than two pin heads side by side.

A second flower is already in bloom in exactly the same way and while we can imagine that we are feeling very pleased with the outcome, we are very puzzled how the flower was pollinated under water and why (so we understand) everyone else has had surface flowers from which they have got no results.

To support the foregoing we are sending along a sample of a seed and a seedling as we are very keen to learn more of this unusual occurrence.

Lincoln. F. W. BOUAS.

The specimens sent by Mr. Dobbs were forwarded to Mrs. Frances Perry, F.L.S., and she replies as follows:

"It is not a very common occurrence for the Madagascan Lace Leaf Plant to flower in this country but I have seen it in bloom in Germany and we once had flowers at our nursery before the war."

"Mr. Dobbs' letter raises several interesting points and I note that he questioned how the plant could have become pollinated beneath the water. This is not an unusual occurrence as it sounds. It frequently happens with *Apogonon distachyon* and *lappaceoides*.

"I would seem that the plant is self-fertilized while still in a bud stage and gradually seedlings develop while still attached to the bud. I have preserved at home two specimens of water-lilies which have done the same thing. These terminated and produced small tubers right in the centre of the flower which still had petals.

"I am afraid I do not know what agencies caused the irregularity but it is presumably due to the sucrose in the growth development.

Mr. Dobbs, however, is fortunate in having this unusual occurrence taking place in a rather uncommon and not always easy to grow aquatic."

Cryptocoryne Disease

Sir—May I give you full support to the view of Mr. Donald Sprigal of Vancouver in the August issue on the subject of so-called "Cryptocoryne disease". I have reached the same conclusion as Mr. Sprigal, that it is unusual water currents which cause the mysterious "rotting" of the leaves of most species of this Genus.

Twice I have had large *Cryptocoryne affinis* plants in different aquaria, and in both cases those leaves which bent over the stone, and were therefore subjected to the vertical air and water currents on their undersides, quickly rotted and died, though the other leaves of the plants remained perfectly healthy.

These examples bring up the whole question of conditions of plant culture in community tanks where the light, temperature, water currents and availability of mineral ions cannot be suitably adjusted for all species and are probably not the optimum conditions for any one species.

In aquaria we provide such conditions that it is possible to maintain and grow aquatic plants in a not unfavourable environment, but the species are unable, except in isolated cases, to reach the climax of their reproductive cycle. The whole concept, however, that most aquatic plants, like many tropical fish, must be kept under close ranges of pH and water hardness, and that if they are not so kept they will not thrive, is completely untrue.

The secret, and one pays it a compliment by calling it that, of growing plants in a wide range of physical conditions is to make the change from one environment to another as gradual as possible.

The example of "Cryptocoryne disease" underlines the readiness of hobbyists to bestow upon any slightly abnormal appearance of plants, or fish the magic title of "disease" which they regard with great mysticism until they discover the real simple explanation clearly growing the observed evil.

Boston, Lancs. DUNCAN SCULLTHORPE.

Flowering Cryptocoryne

Sir—Having recently had a *Cryptocoryne griffithii* flower I thought that other readers might be interested in the procedure I adopted to bring this about.

The plant was grown in a tall jar (or under any conditions, i.e. only the roots and part of the leaf stems were under water). The top of the jar was covered with a plastic lid from a lunchbox.

Natural daylight was used, the plant being in my bathroom. At the time of flowering the plant was 6-7 in. high, the leaves being dark green.

The actual flower is of the "strumpet" variety; it stands on a very narrow stem that opens out into an elongated "bell" shape that has a curl of twist at the top.

The colour of the stem and trumpet is white; the curl at the top is dark red.

London, S.W.9. C. FORD.

L. E. Parker's photograph of Mr. Ford's *Cryptocoryne*.

Mr. Dobbs, however, is fortunate in having this unusual occurrence taking place in a rather uncommon and not always easy to grow aquatic."

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Filamentous Algae
I have a lake (an old gravel pit) of about 3 acres in extent, well sheltered by surrounding trees. Would it be a sound proposition to introduce some breeding pairs of Goldfish on the assumption that they would multiply to large quantities with little or no attention? I believe could solve this, as a Golden or Silver Orfe, Shubunkins and Petrels, be introduced.—(J.W.L., Manchester, Berks.)

Provided your gravel pit does not receive flood drainage there is no reason why you should not breed any of the fish you mention, naturally and in fair quantity. However, introducing Goldfish outdoors in this country on a commercial scale is not a sound proposition as the Summers are too short and too cold.

Furthermore, fish like shallows to breed in and fry they also develop in the shallow water. The reason for this is that too deep a body of water seldom reaches 65 deg. F., which is a minimum temperature requirement for successful breeding. Hence it is also necessary for the aquatic farms of the Goldfish to turn from olive green to gold.

The small booklet, "Garden Ponds", by Capt. L. C. Betts, M.B.E., can be obtained at price 1s. 10d. including postage, from The Publisher, Poultry World Ltd., and should prove helpful to you.

Common Toad

I have a young Common Toad (2 1/2 in. long) which I have kept since April. It has been very contented but it is always found under the rim of the water bowl. It catches every movement of live food but does not seem to eat it. It is extremely fat and would it prove harmful to keep the creature indoors?—(Miss M., Freeton.)

It would appear that the toad is attempting to hibernate. In nature this would be the time when wild toads hide themselves away in cracks and holes in the ground in hollow logs, basements of houses, etc., to get away from the frost.

If you feel that your specimen is in good condition, and has fed well, we would advise you to remove it in its box to some cold but frost-free place (as for a tortoise) such as a greenhouse, garage, cellar, or shed.

Give it something to burrow into, and it should remain there until next Spring. Alternatively, you could place the toad in a plastic bag in the forced air, in a bed of damp leaves or moss.

If this toad is brought indoors throughout the Winter, it should be kept warm and active, and must be fed throughout. However, we do not advise this, as it is contrary to the creature's nature.

Judges for the Olympia Show

Combined Cage Birds and Aquaria Event on January 8-10

JUDGES selected for the Aquaria Section at the National Exhibition of Cage Birds and Aquaria on January 8, 9 and 10 at the National Hall, Olympia, London, W.14, are—Mr. R. G. Nealand (club tropical furnished aquaria and individual tropical or coldwater furnished aquaria), Mr. C. W. G. Creed (club tropical furnished aquaria and miniature furnished aquaria), Mr. B. Meadows (club coldwater furnished aquaria and reserve judge) and Mr. A. Bourder (individual tropical or coldwater furnished aquaria and miniature gardens with a pond motif).

Entries were coming in well at the time of going to press and a satisfactory representation by the closing date, December 12, seemed a certainty.

Apart from the competitive classes, there will be special displays of the Goldfish Society of Great Britain, the British Herpetological Society and the South London Field Studies Society.

The judges represent a huge number of countries. British and foreign birds and butterflies will be on show and the National Council of Aviculture will run a Convention in conjunction with the event.

The exhibition opens to the public at 2.30 p.m. on Thursday, January 8, and continues on that day until 9 p.m. Up to 5 p.m. on the Thursday, the admission charge is 5/- and after 5 p.m., 3/-.

On Friday, January 9, the show opens at 10 a.m. and closes at 9 p.m. and on Saturday, January 10, the show runs from 10 a.m. to 8 p.m. Admission is 4/- up to 5 p.m. on Friday and Saturday and 3/- thereafter. Children under 14 are admitted half-price at all times.

Scottish Commentary by K. A. M. Robertson

THE last two months have been the busiest on the Scottish aquarist's calendar for many years and have included the annual shows of the Edinburgh Aquarist Society and the Scottish Aquarium Society, as well as an inter-club quiz at Greenock, and a film show at Dundee.

The Edinburgh show was again held in the club premises in Infirmary Street and, although small, was found to be a most interesting exhibition to the many visitors who attended. From the organisers' point of view the disappointing feature was the lack of support in the inter-club furnished aquaria class.

Of the seventeen clubs in Scotland only four entered and three of these emanated from Glasgow, the other society concerned being from Motherwell.

The individual furnished aquaria class was, however, very well represented by some 16 aquarists. Mr. E. R. MacDonald taking the major award. All who were at the Edinburgh Show much appreciated the hospitality shown by the hosts.

The inter-club quiz organised by the Greenock & District Aquarist Society proved to be a really entertaining evening for those who managed to attend. This society succeeded in bringing all the company into the competition with the aid of an episcopos. The teams, and also individuals, were given pencil and paper, various fish, plants and other photographs were flashed on the screen

and those present were asked to write down the names of specimens.

Some of the coldwater entries emanated from Newcastle and there were about 40 tropical exhibits from the Dundee area as well as many from Edinburgh. Two of the finest quality *Apogonon fenestrata* (Madagascan Lace-leaf Plants) were on view.

In the furnished aquaria section the exhibit which was of most interest was a tank set up by Greenock club which gave a general picture of a mill with working water wheel and a most artistic layout under water. The mill and water wheel were made by one of the members of the society and, with the aid of a small pump, the required working model was achieved. In this particular section the Inter-Club Trophy went to Edinburgh Aquarist Society.

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

THE Bristol A.S. open show always acts as a natural magnet for aquarists in the southwest. This year there was a very welcome volume of support from new and old friends with the result that entries were up on last year.

An old friend, Mr. R. J. Upchurch has resumed exhibiting at Bristol and has brought with him some magnificent fish, one of which, a splendid Bubble-eye, took the award for the best exhibit in the show.

I should also like to congratulate Mr. Scott Morgan, of Bourne-mouth, who was showing at Bristol for the first time. His Swordtails were the best livebearers in the show and won him the Sturtevant Cup.

A word of praise must also go to Mr. G. Stone who acted as show manager of the tropical section and won one of the three W.C.R.A. Litt diplomas with his large *Apogonon fenestrata* in fine colour.

Other aquarists will no doubt see something of the show as I noticed Mr. and Mrs. Roy Skipper taking many photographs to add to their already fine collection.

I hope that all those involved in the show at Bristol are satisfied with their efforts, both in planning and execution, because I heard nothing but praise for their work.

The show is much better balanced between tropical and coldwater entries and, in my opinion, the standard of the tropical entries now closely

approaches the high level that is expected among the coldwater exhibits at the Bristol A.S. annual exhibitions.

At Postport show two members of the Bristol and Bath Section of the Guppy Federation won silver pins. Reggie James benched a Best-in-Show award that earned a Best in Show and a pin and Roy Bryant took the first three places in the Double-voiled class in winning his fourth pin. Rodney Vice won a first in the Coloford class against confident local opposition.

Mr. W. Hips receiving his three cups (including the Fisher Trophy) for work at Bristol Show fish, Aquaria.

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Midlands Miscellany by W. L. Mandeville

TO avoid accusations of "poaching", many societies add the words "and District" to their title, the "district" usually covering anywhere from whence a member may come. Long established societies, formed when the recruitment area could be extensive, carry an area designation such as the Midland Aquarist & Pond Society. The Walsall society deleted "District" from its title, however, being content with a membership augmented by Cannock, Wednesbury, Aldridge and Great Barr.

Not only does membership come from farther afield than Walsall, but also recognition. The recent visit of the Mayor and Mayoress of Walsall—Councillor and Mrs. F. E. Harrison—was followed by a visit from the Mayoress of Wednesbury—Alderman V. Stood—to adjudicate in the debate between Walsall and M.A. & F.S. His Worthip's ability to debate put both societies on their mettle and his charm and humour put everyone at ease.

Crying in the Wilderness

When I was in conversation with a cage-bird fancier at the City of Birmingham Show in Handsworth Park, inevitably the conversation turned to the respective merits of the two fancies—birds and fishes—with a comparison of the numerical strength of them.

Both have followings of what might be termed "organized adherents" and, in both fancies, these are outnumbered by the unattached—but equally enthusiastically—"keepers" of birds and fishes.

To upset this equilibrium, I ventured to suggest that more instruction was available through aquatic societies than obtained in many other cultural interests. This point was greeted to the ground by the comment, "Then it's about time that someone told them the difference between 'species' and 'variety', for apparently they do not know it!"

The inference is only partly true. For many years now writers, speakers, and judges' panels have campaigned against the wrongful use of "variety", but to little effect. Year after year, the show schedules appear for table shows and open events, often with a glorious mixture of "Family", "Genera", "Species" and "Variety" nomen-

clature. Any Variety Barb, Any Variety Cichlid, Any Variety Characin, etc. is invariably followed by Any Variety Tropical Fish, which is just nonsense.

All this probably originated from a slavish copying of other cultural show schedules such as those for dogs, cats and roses, where varieties are scheduled, and "other varieties" catered for, but they refer to varieties and mean varieties.

So far as the tropical fancy is concerned, with the exception of the Guppy section, the word "variety" can be forgotten.

Any Barb—any Characin", "Any other Tropical Fish" is clear and understandable, and would at least prevent the perpetuation of error. Some might say that the matter is of little importance. If that be so, then scientific accuracy is a waste of time, and there can be no virtue in trade.

Best Behaviour
"Visitors Welcomed," are two words that appear in the literature of almost all societies; and visitors to a meeting have much the same effect as visitors to our homes, a little extra tidying up, something special at the table, and an atmosphere of complete harmony.

One of the incidental advantages of the recent Midlands Show has been an influx of visitors to every society in the area, visitors that in many cases have crystallized into members.

Visits between societies are becoming more frequent—the Northfield Society invites Smithwick to its Christmas party, Wolverhampton, through its chairman, Mr. F. V. Law, invites Walsall to any meeting; the members tanks & pond compositions of Wolverhampton, Walsall, Smethwick, Coventry and Nottingham bring judges into the home with a distinct improvement in members' aquaria and a exciting together of the social side of our hobby that consolidates society life.

Even my own natural ability to convert any living accommodation into the semblance of a piggery is restrained by the occasional committee meeting, which is held at day address, where domestic order replaces organized chaos for such occasions.

News from the North-West by "Aquatius"

ONE of the most active and successful societies in the North, the Blackpool & Fylde Aquatic Society, had the honour of being invited to display its collection of tropical and coldwater fish at the local "Home and Beauty" Exhibition in November.

The Blackpool society's stand covered 400 square feet on the balcony and was laid out in two sections, one being a replica of a lounge, complete with a furnished aquarium on a wrought iron stand.

The remainder of the display consisted of six two-foot furnished aquaria, plus a number of small competition tanks exhibiting fish in pairs

and singly, all made attractive by a suitable background of decorative shrubs and flowers.

The tanks had a grey finish, the large ones in two banks of three set at an angle of 45 deg. on either side of the stall, and the individual fish tanks arranged in a timbered frame in the centre.

Many people, of course, were responsible for all this work (how seldom does the public visitor who has never seen the effort before an exhibition event realise the amount of voluntary work involved), under the able organisation of Mr. A. Sidebottom, secretary of the Blackpool Society. Incidentally, any fishkeepers in the Fylde who have not yet joined the society should contact

Mr. Sidebottom at 26 Wensleydale Avenue, Blackpool.

Across the River Ribble the hobby is kept to the fore in Lancashire's other great seaside resort at Southport, on the south bank of the river, by the fortnightly meetings of the Southport Aquarist Society, who were represented at November's British Aquarists' Festival in Manchester.

One of their recent meetings had an interesting and successful alternative to a lecture, which other societies might find useful. Often a very knowledgeable and experienced fishkeeper has the idea of giving a lecture. In this instance, a well-known Lancashire aquarist said that, rather than give a talk, he would prefer to answer questions and try to solve any problems experienced by members.

Many questions were asked about the treatment of sick fish, the breeding of various tropicals, the best way of promoting the growth of certain plants and the use of livefoods and dead foods for feeding adult and newly-hatched fish. Obviously the speaker covered considerably more ground, and got right down to what the members wished to hear, much sooner than if he had given a straight lecture.

Mr. C. M. Mansfield's recent new fishing book "Small Fry—How to Catch Them", is the first to include the Bittering among British fishes as a result of the evidence of its wide distribution in several waters of south Lancashire published here and elsewhere the other year.

Like all this popular fishing aquarium fish has been found to inhabit one or two waters in Cheshire, such as Black Harry's Hole, near Macclesfield, and the London Natural History Society's century survey by Mr. A. C. Walsler of the British Museum recorded it from a pond on Hadley Green, Hertfordshire, where Mr. Lansbury discovered it in 1956.

I am getting people tell me they believe that the Azarins or "Blue Roach" of Yarwell still exist where he recorded it, in Knowsley Park, Lancashire. They mention people who have caught specimens and tell me of waters where it has been taken. They assure me it is neither Bitterling, nor the blue-tinted Roach, nor Rudd.

No Personal Success

I have searched these waters thoroughly without success, and have not yet been satisfied with the evidence of any claim I have followed up. However, I am eager to have any further evidence, and particularly any specimen, for critical examination. It would make a lovely coldwater aquarium fish if we could only prove such a fish exists.

The British Record Fish Committee at Peterborough is trying to get its records of native Brown Trout in order, and has invited details of any authentic specimens more than 10 pounds in weight. Although nothing in the North-west has even approached the big Scottish and Irish fish, specimens have exceeded 5 lb. from the Bishop's Pool at Khandall on the Chyod (1949) and from the Des at Bala (pre-war). The biggest, weighing 12 lb., was caught at Black Oxen in Snowdonia. Penant's famous specimen of 22 lb., from Lake Bala, may well have been a dark salmon, as these fish are often called "Aquatius", 47 Goodwin Road, Liverpool, 15.

Fishkeeping, December 1958



by H. O. MUNRO

WE have heard previously of several mouth-breeding Anabantids and it is therefore very gratifying to see a detailed report on the breeding habits of *Betta tartaria* by Dr. P. Kueper (DAZ for November). Kueper received four of these fishes from Rudolf who had first described them a few months previously in "Aquatik". In shape the fish resemble female *Betta splendens* and seem to have reached maximum size when just over 3 in. The sexes are not distinguishable by shape, finnage or coloration. Colour varies greatly in each individual and it can change: horizontal stripes can dissolve into spots or disappear. The fishes are normally very quiet and rather shy, resting quietly on the bottom of the tank, but they shoot out and catch livefood and then with their feeding and catch food. They are not "fighters" and several males can be kept in one tank.

These Bettas do not build a bubble-nest of any description. They breed very readily under aquarium conditions and a female will spawn every four or five days, changing from one male partner to another.

The spawning pair circle round each other displaying their fins and keeping other fishes out of the way. After several hours of circling and courting the male embraces the female rather in the manner of other Bettas when the female lays between 2 and 20 eggs. These rest on the fins of the male fish who sits in the position of embrace even after the female has left him.

The female then picks up all eggs, first from the fine of the male fish and afterwards any which may remain on the tank base.

Now starts the most amazing part of the performance. The fishes float near each other and the female starts to blow out the eggs and catches them again until the male has interested and snatched them up one by one. When all eggs have been taken over by the male in this ball game the fishes are ready for the next spawning.

After the final spawning the male fish, with a full crop of eggs in his mouth, goes into hiding. The fry are released after eight to nine days when they will swim away on their own immediately. There is no parental care after the fry have been released but Kueper could not observe any cannibalism either. On the other hand it did happen that the male swallowed the eggs after the first day instead of incubating them.

The detailed observations are accompanied by an excellent sequence of photographs showing all stages of courtship and the actual spawning.

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Club Notes & News

Between 50 and 60 members attended the 21st anniversary dinner of Northfield A.S. on October 21 when speeches were made by Mr. H. P. Lynn (President), Mr. H. Walker (Chairman) and a previous secretary, Mr. S. Knibbs.

Officers elected at the A.C.M. of Tansil A.S. were President Mr. N. Staines; chairman, Mr. A. Dorriety; vice-chairman, Mr. G. Aston; secretary and treasurer, Mr. D. Langdon; Mr. Preston Green, Viceil, Secretary. The November meeting was addressed by Mr. G. Aston on the subject of "Charities".

Members of Luttrell Major A.S. visited Walthampton A.S. for the latter society's November meeting when an inter-club table show was arranged which Luttrell Major won. The judge was Mr. J. E. Clarendon. During judging the two societies discussed ways by which they could help each other and their Mr. H. V. Jenkins answered questions on coldwater fishes.

The Aquarist Circle (Furness Hill), a newly-formed group, has Mr. E. A. Shaw, 54 Valentine Court, Ferry Vale, Forest Hill, London, S.E. 2, as secretary.

The New Forest A.S. arranged a small exhibition at the Lynton Community Centre on November 29. Secretary of society is Capt. E. Howarth, Meadow End, Stone, Hants.

Since the Walthampton A.S. successful 1958 show the society has been very active. A film show was given by Mr. Mason Smith in conjunction with the private presentation evening. Nine furnished aquaria have been set up at room shows and night fish parties and one there has been treated as a result of this effort. A party of Walthampton members travelled to Manchester to visit the British Aquarists' Festival in November. Premier prizes in the recent breeding trials table show were taken by Mr. T. V. Hill with his Serpae Tetras and Red Snowflakes.

At a recent meeting of East London A. & P.A. Mr. S. B. Leary was elected press & social secretary. Mr. F. C. Peckley gave an illustrated film on "Aquatic and Bog Plants" at the October 21 meeting and, on November 7, Mr. Fairweather showed some films.

The annual dinner and social evening of Ayrlebury A.S. is arranged for December 11.

Mr. S. W. Atkins, F.B.A.S. chairman, and other members of the Federation Council attended the November 20 meeting of British A.S. in conjunction with an informal evening dining which Mr. Atkins presided over. The evening was most successful. The trophy for the best furnished pond fish of the year went to Mr. R. Smith with a 55-poun Dewar Gourami and Mr. J. Harris won the club championship plaque for the besthubs number of awards. First prize/ness at the October 23 and November 6 table shows were Messrs G. G. G. and J. Bradbury. Mr. E. H. Burton, 178 Grove Road, Moulton, Surrey, was secretary at the November 13 A.C.M. and he will be pleased to hear from prospective members.

Mr. R. Gill spoke at the November meeting of Bradford A.S. when he discussed the club's annual dinner and table show for Christmas. The club's annual dinner was held on November 21 and the A.C.M. is scheduled for January 7.

The production of Mikro-worms and White Worms was discussed by Mr. Frank Arnold at the November 19 meeting of Blackpool A. & P.A. Winners of the table show classes for Guppies on the same evening were Messrs. Thomas and Simpson.

December 8 will be an inter-club picnic with E. Luttrell A. & P.A. Any aquarist interested in the Fishkeepers' Guild should contact the secretary, Mr. V. Price, 16 Horse Road, Barkingside, Bford, Essex.

Foughter members were welcomed at the November meeting of Luttrell Major A.S. The club's chairman, W. D. F. J. Staines, has been posted to Plymouth and Mr. W. J. Waters has taken over this position.

The Earth A.S. reports a successful year with membership showing a continuous increase. There was a talk by Mr. Baker on "Guppies" at the October meeting and the A.C.M. will be held on December 20.

Best fish in show at the Scottish A.S. exhibition held in November 12 was a Blue Acara exhibited by Mr. B. Christie, Edinburgh A.S. entered the best furnished aquarium.

The current show season was discussed at the November meeting of Bristol Coldwater Fish Breeders' Group. The society's members were asked what fish are listed by other members of the Group will again be in operation for the 1959 fishbreeding season.

A display of tropical and coldwater fish was put on at Blackpool & Fylde A.S. at the annual Home and Beauty Exhibition in Blackpool from November 11 to 22. More detailed information is published under News from the North-west.

There were changes for both junior and senior members at the November 4 table show of Dunstable A.S. when trophies for technical entries were asked for and also White Cloud Mountain Minnows.

New members were enrolled by Independent A.S. (Luton) at their successful stand in Edington Town Hall from November 17 to 21, arranged as part of the Edington Arts and Crafts Show. One of the society's officers, Mrs. J. Joyce, won second prize at the British Aquarists' Festival on November 1-8 and received a special Diploma.

The Dunstable A.S. arranged an interclub meeting with Farnham A.S. on October 7 when there was a table show with 40 entries. First prize/winner were Messrs A. Cross, G. B. Kirkland and A. S. Ramsay. Best fish in show was a 12 lb. B. Kribia's Serpae Tetra. Prizes were also winners. Mr. A. Robertson gave a talk during the same evening. Two films were shown on November 13. The titles were "Activities of the Harrow Club" and "Cold Waterworld".

An illustrated lecture on "Fond Life" by a Hastings schoolteacher, Mrs. F. Isakson, was well received by Baskin A.S. members at their evening meeting. The membership of this society has been increased to "Angry", Parkhouse Road, Bexhill, where a film show on December 4 concentrated the year's programme.

The Amersham Grove A.S. has been making trials of various tropical fishes and in the final trial Pines and Goldfish were used.

New secretary of Throckley A.S. is Mr. F. G. Hildre, 16 Davy Avenue, South Oxendon, Essex.

Netherlands Exhibitor Stages Best Guppy

BEST fish in show at the annual exhibition of the Federation of Coldwater Societies was a Blue Veiltail shown by Mr. J. Salomon of the Federation's Hague Section. The same exhibit was also leading overseas entry and best in the F.B.A.S. Section.

Best scenic fish in show was an Albino entered by Mr. G. Phillips, while Mr. R. Wesselaar took the best breeding award with his team of Bostromscoops.

The North-London Section won the inter-section prize-competition with 124 points to runner-up Eastern Counties.

First prizes were Mrs. J. D. Smith (Goldfish), E. E. Matthews (Robinson), A. Lindwood (Bovendroef), J. C. Wilson (Sperduke), R. Pevin (Platfish), R. Wesselaar (Scarfish), E. S. Bosch (Coloured Veiltail), J. Salomon (Black Veiltail), R. P. Breyer (Double-sword), Mrs. I. D. Smith (Lyretail), I. H. Thomas (Bostromscoops), E. S. Bosch (Tropica), E. Matthews (Grey Female), T. H. Thomas (Gold Female), W. Howe (Goldfish Female), Mrs. J. D. Smith (Robson Female), Mrs. J. D. Smith (Coloured Female), W. G. Phillips (Albino Female), R. Wesselaar (Breyer Male), E. S. Bosch (Female), H. Gerrard (Gold Male) and Mrs. I. D. Smith (Goldfish Male).

Prize prizes in the international classes were S. P. Fisher (Ghorasidi), S. P. Fisher (Lacostia), Dr. E. Schmidt (Coloured Female), K. Nisch (Cold Double-tail), Dr. E. Schmidt (Female), G. M. Wesselaar (Goldfish), M. Mengel (Bostromscoops), Dr. Meester (most coloured Veiltail), E. Pruning (Halfblack Lacostia), R. Bohmer (Scarfish) and H. Mengel (Lyretail).

In the international contest (three fish per section) East Counties were first, with Germany second, The Hague third and Bostromscoops fourth. In all, 14 sections of the F.B.A.S. participated at the exhibition.

Best provincial exhibitor was the Plymouth entered by Mr. F. C. Peckley and the most successful exhibitor was Mrs. I. D. Smith. Total entry for the event, held this year at Bostromscoops, was 564.

Television Appearance

B.B.C. reporter John Tidmarsh interviewed Mr. E. R. Collins of Messrs. Whitwell & Smyke, for a recent television programme of fish arriving from the Far East and Mr. Whitwell explained that the United States would benefit the export and export of tropical fishes.

Goldfish Film Available

THE British-Claire Friendship Association, 226 Grosvenor Lane, London, W.C.1, has a Chinese film on Goldfish available for hire. A coloured colour film.

running for 12 minutes, with English subtitles, it shows the great variety of Chinese Goldfish and also a little of their breeding. The hire charge is 7/6 plus postage and clubs interested in the film should approach the Association.

F.B.A.S. Assembly

AT the September 27 assembly of the Federation of British Aquarist Societies delegates were told that the Council had considered motions which could arise from the tape-recording of lectures. The opinions of affiliated societies and lecturers were asked for before a definite policy was formulated.

Visitors' tickets at his gathering were Messrs. R. C. B. Lill, P. S. Campbell and J. H. Glover. The F.B.A.S. A.C.M. is scheduled for December 13, commencing at 2.30 p.m.

Increased Attendance at Manchester Festival

SOME 200 more tanks than in 1957 were on exhibition at the British Aquarists' Festival held at Bala, Wales, Manchester, on November 8 and 9. Visitors who were present estimated that the attendance exceeded that of the previous year. The opinions of affiliated societies and lecturers were asked for before a definite policy was formulated.

Visitors' tickets at his gathering were Messrs. R. C. B. Lill, P. S. Campbell and J. H. Glover. The F.B.A.S. A.C.M. is scheduled for December 13, commencing at 2.30 p.m.

Main prizes were J. Hodgins (Dwarf Platichthys Challenge Trophy for best fish in show) with an *A. rufocaudatus*, Acromogon A.S. Silver Challenge Trophy for best furnished aquarium, G. Longford (Walter Scott Memorial Shield for best individual tropical furnished aquarium), M. Welch (Haworth Trophy for best individual coldwater furnished aquarium), H. Locket (Silver Challenge Cup for Guppies), R. Leigh (Silver Challenge Cup for A.C.S. Invertebrates), Mrs. M. Fisher (Silver Challenge Cup for coldwater fish), Dr. A. J. Linton (Silver Challenge Cup for Angles), Mr. Smart (Silver Challenge Trophy for Dwarf Cichlids), R. Peckley (Silver Challenge Cup for A.D.S. Amphibia), Dr. Ormerod (Silver Challenge Trophy for Platfish), R. Leigh (Challenge Trophy for Lyretails), R. Hudson (Challenge Trophy for barbs), J. Hodgins (Silver Cup for Characins), F. Bentley (Challenge Trophy for Guppies and Minnows), J. Hodgins (Challenge Trophy for Catfish), D. Ormerod (Challenge Trophy for Guppies), J. Hodgins (Silver Challenge Trophy for Dwarf Cichlids), J. Hodgins (Silver Challenge Trophy for Dwarf Cichlids), R. Peckley (Silver Challenge Cup for A.D.S. Amphibia), Dr. Ormerod (Silver Challenge Trophy for Platfish).

Other special prizes went to Mrs. J. Joyce (F.B.A.S. Dippers for outstanding effort, Acromogon A.S. 18 guineas for the society with the highest standard) and Bentley A. & S. 10 (guineas for the most points).

The Kees Shield for Lancashire v. Yorkshire inter-club competition was won by Lancashire.

At the B.A.F. (Manchester) Mr. C. Hill (left) of Northfield A.S. winning best fish in show among coldwater exhibitors, while Mr. W. R. K. (right) of Luttrell Major A.S. winning best fish in show among tropical exhibitors. Photographs, A. Saxton.

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Fishkeeping, December 1958

Fishkeeping, December 1958

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Bristol Society's Annual Exhibition

THERE was an increased attendance for the Bristol A.S. show held from October 31 to November 1, with many visitors arriving for membership of the society.

The exhibition attracted 483 exhibitors and had fish in show was a half-size Goldfish show. Mr. B. J. Upechanch who was awarded the Mallet Davis Trophy. Highest number of points was gained by Mr. W. Hicks who won the C. G. Denton Cup.

The show was opened by Mr. T. Pope, entertainment officer of the Bristol Corporation. The new club used its own staging for the first time. Trade stands were accommodated in the hall and the main stage was decorated with plants, flowers and pictures loaned by the Bristol Zoological Society.



Mr. W. Hicks, successful exhibitor at Bristol, holding the cup which he won for the best tropical aquarium and also the trophy for the best Goldfish in the exhibition.

Judges' Panel

Judging the tropical section was Mr. W. L. Mandeville, water planters, E. R. Burdett, T. L. Dodge, S. J. Davis, N. O. Grimston, V. E. Jones, W. Butler and H. C. B. Thomas, officiated in the coldwater class.

Remaining trophy winners were: B. J. Upechanch (Eric Barber Cup), L. J. Spencer Trophy and B.A.S. Cup, N. O. Grimston (B. T. Child Challenge Stool), A. D. Brooks Cup, C. F. Whitehead Cup and Bristol Coldwater Breeder's Trophy, W. H. Webb (H. J. Shepherd Cup) and O. E. Organ Cup, Mr. Scott Morgan (Fancy Goldfish) Cup, Sunrow Cup and Kayvanah Cup, H. Aston (W. Barber Cup), W. Hicks (Mid-Somerset A.S. Cup), E. R. Burdett Cup and Thomson Will Cup, M. Welch (A. W. Barber Cup), P. J. Simmonds (B.A.S. Cup for Coldest Fish), L. G. Emery (Mrs. E. R. Burdett Cup and Best Hill Cup), E. Roe (R. G. Wason Cup), H. V. Jenkins (S. J. Davis Trophy and Zebra West Cup), L. E. J. Challenger (J. S. Swary Crystal Goblet), H. Rundle (Lowell Baldwin Cup), E. A. Howell (F. Robinson Cup), R. S. Warr (H. H. King Cup) and T. J. Helges (E. Jones Cup).

First prize winners were H. Aston (Common Goldfish), W. Hicks (O. G. Shubankin and 5 in Shubankin), B. J. Upechanch (Velvet and Half-size), W. G. Bryant (Nymph and Comet), M. Welch (Scout Fish-

tail), P. J. Simmonds (Calico Fantail), B. Simkins (river fish), L. G. Emery (1958 Shubankin and matched pair of Shubankins), N. O. Grimston (1958 Mosaic Moon, and 1958 Tawashi), C. D. Roe (A.C.G.S. 1958 Fancy Goldfish), H. V. Jenkins (Breeder's 1958 Shubankin), S. J. Evans (coldwater furnished aquaria), L. E. J. Challenger (from furnished aquaria and 1958 plants), Bristol A.S. (intensity furnished aquaria), S. J. Davis (coldwater plants), H. Rundle (Fighting Fish), F. A. Modell (A.O.S. Laboratory), R. S. Warr (Barb), H. H. Jones (Lionfish), L. G. Emery (Shorthead Guppies), R. Jones (Lionfish Guppies and Female Guppies), M. Scott Morgan (Swordtails), L. B. Somers (Platies), Mrs. and Mrs. J. J. Holmes (1958 Breeder's Lionfish), G. S. Stone (Cichlids) and D. Baylton (breeder's em-

W. J. Burns

READERS will regret to learn that Mr. W. J. Burns of Bedford, a well-known member of Fancy Goldfish Club, died on November 7. Mr. Burns, an interesting man who travelled extensively to visit the hobby, was ever ready to help novices by giving them the benefit of his experience.

He was widely recognized as a skilled fish breeder and his passing will be keenly felt.

Late News

MEETINGS of Palenon A.S. are now held at the Oldbury Hotel, Warner Street, Pigeon and tin at the Zoo Restaurant on Saturdays. Membership has recently increased and any who are interested in joining should contact the secretary, Mrs. E. H. N. (Palenon Zoo).

A social evening for members, their wives and friends was held recently at Birtwickhead A.S. A Billie later Mr. M. Page-Thorpe gave an illustrated talk on "Marine Life and Aquaria." Members of the Birtwickhead club joined with Messrs. A.S. for a visit to the British Aquarist's Festival in Manchester.

The A.G.M. of South Winder A.S. was held in October when Mr. H. G. Randle was elected President, Mr. E. C. Kitching, chairman, Mrs. E. Barrett, treasurer, Mr. E. C. H. Knight, show secretary, Mr. J. Faber, treasurer and Mrs. D. Kitching, Ayles, Crown Lane, Stoke Poges, Slough, secretary. Meetings of the

society are held at the Reindeer Hotel, Slough, on the first and third Mondays in each month.

At a public protest meeting organized by the Ribble Fisheries Association in Preston on November 31, Lord Fraser of Lonsdale, C.H., C.B.E., said: "Britain is guilty of criminal neglect of her rivers. A clean river is a thing of beauty, but it is also a source of health and wealth. Two sewage works are constructed and no industrial processes are worthwhile for a nation, or even for industry, if it pollutes a river."

Mr. Leslie Coleman, the F.B.A.S. official representative, tells us that the new F.B.A.S. gales and show standards mentioned on page 307 of our August issue, and subsequently applied to production orders, will very shortly be available.

A new edition of "The Goldfish," a booklet by Capt. L. C. Bona, M.B.E., completely revised and with a full-colour cover, is now available for 2/6d. plus 4d. postage. If ordered direct from Postery World Ltd., Dorset House, Stamford Street, London, S.E.1.

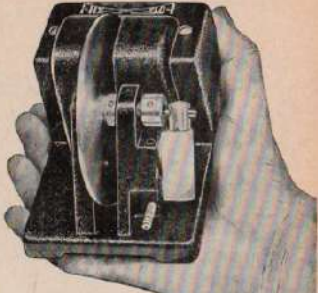
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128 Croydon Road, Beckenham, Kent. Tel: 3716.
Over 120 varieties of Tropical and Coldwater Fish for personal shoppers. Closed Wednesdays. Guaranteed quality plants—see classified advertisement, page 730.

SHERWOOD PET STORES

Frigo, Fairbairns Aquaria Ltd.
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Retailers of all leading aquatic appliances. Good selection of cold water and tropical fish, including many rare varieties. Live foods.

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Tropical and Coldwater Fish, Plants, Foreign Birds, Harpers, etc. Tanks, Cages, Stands and all appliances, foods and equipment.

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Send Christmas gifts for your aquatic friends. For full details see advert on page 723 and see low price list.

(Continued on the next page)

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W. J. CHRISTIAN

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Aquaria and Aquarists. Tropical and Coldwater Fish. Specialist in large aquarium construction and installations.

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Quality tropicals, plants, aquariums, heaters, thermostats, aerators, foods, and every possible accessory. Livefoods always in stock.

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A good selection Tropicals mostly own bred. Imported varieties, Plants, Tanks, Electrical equipment, etc. Reptiles, Small Animals, Birds, Fishes, Tubifex.

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46 Stafford Street, Walsall. Tel: Walsall 1283.
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Staffordshire's most popular aquatic stores. Large stocks of tropical and coldwater fishes, aquatic plants, equipment and accessories. Beginners welcome.

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Forquiter Corner, Redhill, Surrey. Tel: Redhill 607.
Also Stroudly morning until 1 p.m. at 70 Doyers Green Road, Redhill. Tel: Reigate 3951. Tropical, Coldwater fish and all equipment.

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"IS IN THE SWIM"

TROPICALS AND COLDWATER FISH EQUIPMENT PLANTS - LIVEFOOD

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Specialists in exotic fish and cage birds. Lowest new showrooms houses east of the capital collection in England.

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Tropical and Coldwater Fish, Aquaria, accessories, Fish Food, Birds, Garden Ornamentals, Fishing Tackle, Live bait, snappers, Harpers, Stone Crabs, Pigeons.

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30 varieties of healthy tropicals. Comprehensive range of brackets equipment, foods and plants. Advice a pleasure.

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Tropical and Coldwater Specialists. Installations, Tropical and Coldwater. Maintenance. Comprehensive stocks of supplies and maintained. Comprehensive stocks of Aquarists in Alluv, Angle Iron and Pressed Steel. Fish Equipment, Etc.

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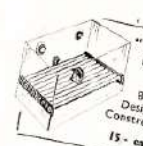
Fishkeeping, December 1958

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The most up-to-date method of Aquarium Filtration.
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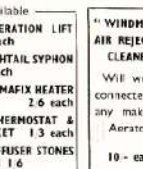
THE NEW "WINDMILL" AERATION FILTER
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The CONCORD "WINDMILL" FILTER will carry over 12 1/2 gallons of water per hour, giving a constant 19 aeration movement of water inside the aquarium.



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Designed for easy cleaning
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PLANTING EQUIPMENT

Aqua Scissors .. 5/- pr.
Aqua Tongs .. 3/6 pr.

THERMOMETERS

Mercury .. each
Gem .. 6/6
Plastic Backed .. 6/6
"Es-Es" Dumpy .. 6/6
Spirit Blue Gem .. 5/-

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Constat External .. 21/-
UNO .. 18/-
Out./Adj. .. 15/-
Ins./Adj. .. 10/-
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"Es-Es" Sentinel .. 26/6
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"Es-Es" Flexible Heaters (100w. and 150w.) .. 19/6

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each

Leon Piston Pump .. 117/6
Hy-flo Junior .. 92/6
Hy-flo "A" .. 117/6
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Hy-flo "C" .. 250/-

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each

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Montrose Minor .. 21/-
Montrose Major .. 24/-
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"Zoobeko" .. 75/-

BOW-FRONTED AQUARIUMS

Complete with stand and Hood (15 in. to centre of bow)

Inches

48 x 12 x 15 .. £19.10.0
36 x 12 x 15 .. £14.10.0
24 x 12 x 15 .. £10.10.0

BOOKCASE AQUARIUMS

BOW-FRONTED AQUARIUM WITH WROUGHT-IRON BOOKCASE STAND

36 x 12 x 15 .. £17.10.0
48 x 10 x 15 .. £25. 0.0

Both available complete in penny-bronze, black and gold, or cream.

FULLY-GLAZED AQUARIUMS PRESSED STEEL

Inches

Inches	Aluminium Tank H/d Refl
12 x 6 x 6	12/- 6/6
14 x 8 x 8	14/- 7/-
16 x 8 x 8	17/- 7/6
18 x 10 x 10	22/- 15/- 8/-

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Inches

24 x 12 x 12 50/- 21/- 8/6
24 x 12 x 15 56/- 21/-
30 x 12 x 15 70/- 27/6
36 x 12 x 15 80/- 32/6
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each

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BOOKS AS SUITABLE PRESENTS

GUIDE TO TROPICAL FISHKEEPING	HANDBOOK OF TROPICAL AQUARIUM FISHES	EXOTIC AQUARIUM FISHES	ENCYCLOPEDIA OF TROPICAL FISHES
by J. H. R. BRYMER	by H. R. AXELROD	by W. T. INNES	by H. R. AXELROD
36/6	75/-	84/-	62/6

Please add 1/- extra postage on appliance orders up to 10/-; 1/6 up to 20/-; 2/- up to 30/-

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111 GOLDHAWK ROAD SHEPHERD'S BUSH, W.12 (1 minute from Shepherd's Bush Market)	QUEENSBOROUGH HOUSE, Ferry Lane, Hythe End,	16 PICTON PLACE, LONDON, W.1 (1 minute from Selfridges)
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