

January 1958

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# FISHKEEPING

*and Water Life*



CLOWN LOACHES (*Botia macracantha*)

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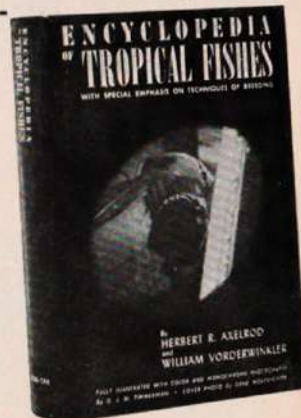
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VOL. 13 NO. 3

NEW ISSUE

JANUARY 1958

## FISHKEEPING

and Water Life

### IN THE SWIM

Hybrid Plant of Merit · Youthful  
Curiosity · Making a Note · Northern  
Aquarium · Head-standers ·  
American Honour · With Thanks

▲ *Aponogeton* hybrid. Albert Greenberg's name frequently occurs in our columns. He is an aquatic plant and tropical fish propagating establishment in Tampa, Florida, which he founded in 1931. In the early 1950's Mr. Greenberg crossed the lovely but difficult-to-grow Lace Leaf Plant (*Aponogeton* *crispus*) with the more common *A. crispus*. The Lace Leaf Plant has skeletoned foliage, while *A. crispus* has strap-like leaves.

The hybrid is more vigorous than either parent, and is brighter green. It has more noticeable venation than *A. crispus* and the "windows" in its leaves (showing its Lace leaf parentage) are covered with just a thin layer of cells.

This hybrid appears to be sterile and it has not been propagated vegetatively. It has not been offered for sale nor given a name. Once the propagating difficulties have been overcome, it could prove to be an aquarium plant of exceptional merit. Information on Mr. Greenberg and his achievement was published recently in "Baileys", a publication of the Botany Horticulturist, New York.

▲ Design Conscious. The short note in our November issue concerning designs of decorative aquariums resulted in a good response from our readers and we hope to feature some of their ideas in issues of this journal. R. L. Housefield, of Bristol, shows his bookcase/aquarium stand in this issue. Other others have ideas for aquaria behind boxes and in wooden cabinets.

● Kitten perplexed. It's hardly surprising that the kitten in our photograph is just a little doleful as it sees the lively Swordtail give it a tantalizing backward glance. Some sort of window seems to be keeping the fishes from this kitten's grasp—the exact details are too complex for the youthful feline mind—and we have a feeling that no amount of appealing glances will induce the aquarium owner to disclose the secrets of how cover glasses can be lifted.



● For the record. The larger the number of people who record their experiences in various aspects of fishkeeping and breeding, the more helpful it is to hobbyists in general. I would go so far as to say that a notebook is an indispensable piece of equipment for every enthusiastic aquarist.

The time comes for most of us when we either have enough experience with one particular type of fish to be in a position to give a comprehensive account of its character-

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Fishkeeping, January 1958

istics and breeding ways or, alternatively, we find out something quite new and relevant which would be of interest to our fellow hobbyists.

FISHKEEPING & WATER LIFE is always keen to see articles from its readers and especially when they dwell on the writer's experience with particular fishes.

### NEW YEAR GOOD WISHES to our Readers

● **Aquarium variety.** Belle Vue Aquarium has the cared-for look about it that makes a success of a public aquarium and, whilst in Manchester early last Autumn, I inspected the exhibits contained in its 29 aquaria. Perhaps the most impressive aquarium was that containing a shoal of the new Cardinal Tetras. Certainly, when it is in full colour, few people could mistake this fish for its somewhat similar species, the Neon.

Among the unusual species were several that have come into commercial supply recently, including a Characin (*Alester longipinnis*) which was compared with the Buenos Aires Tetra and the Congo Tetra on page 228 of our October issue, and the Climbing Perch, *Ctenopoma acutirostris* and *C. kingiense*. This Aquarium is one which the fishkeeping visitor can wander around with real interest. It is ably handled by Mr. B. Cheshire.

● **Table Gardens.** The response to the newly inaugurated miniature gardens class at Fishkeeping & Water Life's Exhibition on the 9th to the 11th of this month has been most encouraging. Seventeen entries of maximum 18 in. x 18 in. dimensions will be judged by Mr. A. Boarder, the distinguished horticulturalist and coldwater fish fancier. The idea has been tried from time to time at fish shows, but never, we believe, with quite such full support.

● **Nose down.** Head-standers (*Chilochor punctatus*) are Characins that we in Britain class as difficult to breed, but Mrs. N. du Breuil of Hong Kong tells of success that George Bing has had there. Mr. Bing now has plenty of young fish from his own breeding. According to him the needs for successful propagation of Head-standers are one pair of

fish to a tank, Hair-grass planting and green water.

There are some 1,000 eggs in a spawning from which up to 700 fry hatch. Mr. Bing says breeding them is easy—"anyone who can breed Neons can breed them". It should be pointed out that the Chinese in Hong Kong produce Neons in quantity.

● **Illustrious Company.** An honour has come to Gene Wolfshiemer, a regular American contributor to our columns. He has been invited to be the guest speaker for the 1958 Alvin Seal Lectureship of the California Academy of Sciences. A part of the Academy is the Steinhart Aquarium where meets the San Francisco Aquarium Society.

Gene will give the talk early in February and thus joins a distinguished company of lecturers, which have included Dr. Myron Gordon and Dr. Robert Harry of Stanford University.

Gene reminds me that it was Alvin Seal who first made use of Brine Shrimp eggs as a source of tiny livefood for aquarium fish.

● **In appreciation.** Lester Costman, until recently the F.B.A.S. Judges and Lecturers Engagements secretary, has, with G. Proft, recently presented a 24 x 15 x 12 in. tropical aquarium to the Hampstead General Hospital.



Our photograph shows Messrs. Proft and Costman—both members of Hampstead A.S.—with Sister Thomson at the hand-over ceremony.

Mr. Costman has been an out-patient of the Hampstead General for about 20 years and Mr. Proft was an in-patient on three occasions. Their gift seems a very pleasant way of showing appreciation for the care and attention they have received.—L.W.A.



G. J. M. Timmerman photograph

## FISH OF THE MONTH

### CLOWN LOACH (*Botia macracantha*)

*A Far-Eastern fish of unusual character, much in demand for the tropical aquarium*

THE Clown Loach is a supreme example of colour contrast among aquarium fishes. The entire fish is orange which intensifies to red in the fins whilst broad, distinct black bands encircle the body and head, the first running through the eye, the second round the body in front of the dorsal fin and the third round the body and also into the anal and dorsal fins.

Bushes are present and there is a movable mesh underneath each eye, but why it is there is not known exactly, although it has been suggested that it is used to protect the eyes when the fish is burrowing.

The species is not of the typically eel-like shape common to most loaches but is deeper bodied and its tail fin has two lobes. In fact, in many ways it resembles the *Corydoras* catfishes.

Clown Loaches were received with great excitement when they were imported a few years ago for the first time since the war, but they have never been cheap and are unlikely to come into the lower price bracket until they have been bred in aquariums.

They have the alarming trait of resting on

their sides at times but this does not mean approaching death with the Clown Loach as it would with other fishes and, in fact, it causes the aquarist—viewing it for the first time—more heart-tremors than it does the fish!

The species is reputed to grow to six inches or more in its natural haunts, but aquarium specimens rarely exceed 3½ in. Clown Loaches are shy by nature, an unfortunate characteristic when there is such brilliant colouring to display. Their main activity is at night although other species swimming in the clear areas of the tank will help to overcome their shyness to some extent, provided not too many hiding places are available.

Once the fish has settled down in its aquarium it will usually live for a long time, taking a variety of foods. Its temperature range is in the region of 70-80 deg.F. with the mid-seventies a happy compromise. These loaches tend to stay in the lower levels of the tank and mulm on the bottom should not be excessive, otherwise clouding of the water will result.

The Clown Loach comes from the Far East, especially the East Indies, and is occasionally called the Tiger Botia.

## Water Scorpions

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

Illustrations by the author



The production Water Scorpion (*Nepa cinerea*).

RELATED to the Water Boatmen discussed in the last issue are the Water Scorpions, true bugs with the typical beak-like rostrum with which their prey is pierced and its body-fluids sucked out. There are two species in Britain—the Water Scorpion (*Nepa cinerea*) (upper illustration), an insect about 1½ in. long, exclusive of the tail-spine; and the rarer Long Water Scorpion, or Water Stick Insect (*Ranatra linearis*) (lower illustration), with a body nearly double the length of the commoner species.

Both have one feature in common; it is the long structure at the tail-end of the body,

The Long Water Scorpion (*Ranatra linearis*), sometimes referred to as the Water Stick Insect.



which from its resemblance to a sting has gained these bugs their common name of scorpion. The spine is, in fact, merely a breathing-tube and consists of two half-tubes which, when brought together, make a very efficient structure for conveying atmospheric air from above the water surface to spiracles, or air-holes, at its base.

Both insects are sluggish creatures, remaining motionless for long periods either among water plants or on the bottom of the pond, waiting for any small animals to come within reach of the front pair of legs, which are modified into strong grasping organs.

The remarkable resemblances to a dead leaf or piece of stick, depending on the species, no doubt serve to make the bugs inconspicuous to their prey. Small fish, and particularly fry, would fall very ready victims to these predaceous insects which, on account of their sluggish nature, could easily be introduced into a pond or aquarium with new water plants.

The cigar-shaped eggs of both the Water Scorpion and Water Stick Insect are laid in incisions made by the female in the stems of water plants. Although the eggs themselves are usually embedded so deeply that they are scarcely visible, the white filaments which are attached to them, and which are believed to be for the purpose of supplying the developing eggs with air absorbed from the water, are usually visible.

The eggs of *Nepa* have seven to nine filaments whereas those of *Ranatra* have only two. A careful watch should be kept for the eggs in water plants introduced to an aquarium in Spring.

## FISH ENEMIES

## BREEDING TROPICAL EGG LAYERS



Black-line Tetra, *Hyphessobrycon scholzei*, a Characin which breeds readily. Photographs, G. J. M. Timmerman.

## Start with Easier Fishes

says D. B. McINERNEY

If you would like to breed Neon Tetras, not just by chance, but regularly and consistently, I think it possible to assure you that you can. I have bred many hundreds of them and four generations can be raised in a year. My methods may not be the only way, but if they are followed exactly I feel confident they will work for you. Or maybe you would like to breed other Characins, such as Glow-lights or Barbs, Aphyosemions or Dwarf Catfish?

To undertake fish breeding on any scale at all it is very helpful to have a small fishhouse, or a spare room which can be maintained at a temperature of 78 deg.F., as Infusoria, Brine Shrimps and Mikro-worms will have to be cultured, and these foods are not ideal to have in the living-room.]

### Equipment Required

A little money will have to be spent as a pH testing kit, and a hardness titrating outfit will be needed when we come on to the more difficult species. In this series of articles I shall endeavour to explain, in simple words, exactly what has to be done to be successful in breeding egg-laying tropicals. When something has to be prepared in advance I shall

mention it, so that preparations can be made in good time. It would be as well to keep these articles close at hand, because later on I shall refer back to earlier ones and thus save repetition.

We shall start with the easier species, working on when more knowledge and confidence has been gained, to the so-called problem fishes,



Black Widows, another Characin species that can be bred by the same method as used for Black-line Tetras. Black Widows grow up to 2½ in. in length.

such as Neons. Our first fish will be the Black-line Tetra (*Heroszkyia scholzei*). In my opinion this is the very easiest egg-laying tropical to breed, but the same procedure will also serve for Black Widows, Feather-fins, Beacoms, Pristella, Silfmon Discus and Glass Characins, though some of them are not quite such ready spawners.

The first task is to buy a breeding sized pair of the chosen fish; most are purchasable, but in some cases younger specimens will have to be grown on. Wherever possible keep males and females in separate tanks; this not only permits the females to be unmolested and have a chance to fill up quickly with roe, but also makes the pair all the keener when they are



Ampullaria snail, very useful when large quantities of Infusoria are required for feeding to baby fishes.

eventually put together in a breeding aquarium. Feed the fish regularly with a good dried food, and give occasional meals of finely chopped and washed Earthworms, boiled cod roe, or chopped cooked meat, fish, prawn or shrimp.

Sexing should not be difficult in mature fish. In most species it is obvious from colour and/or length of finnage; the males usually have longer, more pointed dorsal and anal fins and, with a few exceptions, are generally the more colourful. Unless the females are noticeably rounder, deeper and wider in the belly, do not rush things. Get your fishes into good condition—this is half the problem solved—and never attempt to breed from any female fish until she is literally bulging with roe.

Next you will need at least one breeding tank and, from experience, I find that one measuring 24 in. long by 8 in. high by 8 in. wide is ideal for all but a few of the larger fishes. Since I shall always refer to a tank of these dimensions, you may care to obtain one. It need only have a spot welded frame and be glazed with a base of 1/2 in. cast glass, with four

sides of clear 18 oz. glass, so it should not cost more than 30/-.

However, before we deal with setting up this breeding tank, the pH, hardness of the water, or spawning any fishes, foods to nourish the fry once they have arrived must be prepared. If you only wish to raise a batch of fry now and again, Infusoria can be cultured in 2 lb. jam jars, but at least 12 of these will be needed, two being used daily, in rotation. The cultures should be kept at 78 deg.F. Fill the jars with old rain-water or old tank water, and sprinkle the surface with oven-dried lettuce leaves.

Should you intend to breed fishes regularly, then a small tank of *Ampullaria* snails will provide a permanent supply of Infusoria. The snails are fed fresh lettuce leaves daily, and maintained at 78 deg.F. All that is necessary is to take jars of the water from their tank and pour it into the breeding tank, once the fry are free-swimming.

When the fry are a week old newly-hatched Brine Shrimps can be added to their diet. The dried Brine Shrimp eggs can be bought and then hatched in salt water. Hatching instructions are usually given with the eggs. The newly-hatched shrimps should appear in 36 hours if kept at 78 deg.F. and they are siphoned through fine nylon material and fed to the fry on the point of a razor blade.

Later a few small cultures of Mikro-worms will be wanted. These can be obtained from most hatcheries, and are cultured in shallow dishes containing sloppy porridge on which the worms feed. The dishes should be started one week apart, and kept going in rotation.

At the end of three weeks the original culture will be deteriorating, so new porridge is made, and injected with a saltspoonful of worms from culture No. 2, now at its height. The worms breed so profusely in the warmth that soon they swarm up the sides of the dishes, can be wiped off with a finger and then some are dipped into the breeding tank of fry.

#### Dried Food as the Basis

Once the fry have got beyond this stage a good dried food can become their staple diet, with occasional titbits as previously mentioned. Start producing some of these livefood cultures now and get a little advance experience, then you will be ready by next month to set up the breeding tank and have your first fish breeding attempt.

My next article will deal with setting up the breeding tank and spawning the easiest fishes. I shall only touch lightly on pH and hardness as these simple species do not require such a close range of accuracy that testing kits are essential. You may have had to buy a breeding tank and various cultures of foods, so we can defer further expenditure till later.



## Two New Characters in Singletail Goldfish

by DAPHNE MORRIS

**M**OST Goldfish belong to one of three groups, viz., metallic, nacreous or matt. Metallics have the maximum amount of reflecting tissue and this is situated in a layer beneath the scales giving the fish a shiny or metallic appearance. Matt fish have little or no reflecting tissue, and they have a non-shiny or matt appearance.

Nacreous fish are intermediate between the other two and in them are found nacreous regions, i.e. where reflecting tissue is absent from beneath the scales but is present beneath the skin. Metallic and matt regions are also usually seen on the body but not necessarily so.

The gene for matt is incompletely dominant over that for metallic and the heterozygote (intermediate) is therefore intermediate in type and will not breed true. Nacreous crossed with nacreous produces 25 per cent. Metallics, 50 per cent. Nacreous, 25 per cent. Matt fishes.

It was not until the Goldfish Society recognized the three groups in 1947 that aquarists became aware of their importance. At this time most Matt fish had very little pigment and members of the society began attempts to produce self-coloured strains. The Matt fish in my strain, in common with most others, were generally pink or very pale blue.

In 1931 I found a few fish which had no reflecting tissue but possessed the colouring

of extremely good Nacreous specimens. However, the offspring from these fish did not conform to the expected ratios or types and, although they had the appearance of Matt fish, they did not breed as such. I have called these Pseudo-matts.

In the same spawning I found fish of a second new type. Superficially they appear Nacreous as there is an intermediate amount of reflecting tissue present in the layer under the scales, but this is less than is normally found in Nacreous fish and is absent from the posterior

Upper photograph: One of the author's Mock-metallics. Lower picture: A Pseudo-matt of Miss Morris' breeding. Photographs by E. L. Teller.



margin of scales. When two or three such regions occur together the scales appear not to overlap.

When young, the fish are bluish-grey, but they slowly assume the olive-brown colouring of wild-type fish. Reflecting tissue is deposited very gradually and is very variable. When adult they can be mistaken for Metallic fish. I have called these fish Mock-metallics as, when mated with others within the strain, they do not produce the expected offspring.

#### History of the Strain

The original pair of fish, both Nacreous, was mated in 1949. The male came from Mr. C. F. Whitehead (Portsmouth), but the origin of the female is unknown. No unusual fry were observed in the first generation nor in the second but, due to heavy losses in the latter, there is a possibility that the new types were hatched but died.

In 1952, from a third generation Nacreous x Nacreous, I found the first Pseudo-matts and also about 5 per cent of the spawning were the first Mock-metallics.

Thinking these first Pseudo-matts to be true Matts with exceptional colouring, I mated a pair in 1953 when they were a year old. Of the small spawning only 24 alevins hatched. None was Metallic, but there were Pseudo-matts, Nacreous, Mock-metallics and Matts which were pink in colour.

Subsequent spawnings have proved that when two Pseudo-matts are mated no Metallics are ever found, but that Mock-metallics and Pseudo-matts are always found. In the third generation some few Nacreous were found in Pseudo-matt matings but, in the fourth generation, these were absent. However, when a Pseudo-matt is crossed with an unrelated Nacreous or Metallic fish it acts as an ordinary Nacreous. Mock-metallics, on the other hand, do act as Metallics.

#### Lethal Result

A further complication is that when the fourth generation is reached, the new factors have a lethal effect. This shows itself in several ways. The eggs develop but die before hatching. Some alevins hatch and appear quite strong yet die without inflating their swim-bladders. Others develop swim-bladder trouble after a few weeks. Others, again, are born with grave deformities of the spine.

The lethal effect shows itself most strongly when a pair of fourth generation Pseudo-matts is mated. With the fish so far used in these experiments most attempts have ended in failure, yet outcrosses with the same fish have given successful results.

In 1954 a series of test crosses was undertaken and I will discuss them next issue.

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## Fish Philately

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## Sail Fish

**P**RI NTED in monochrome purple, this 2-cent stamp was issued in 1956 by the Crown Agents for the colony of Seychelles Islands in the Indian Ocean. It depicts a Sail Fish of the Genus *Istiophorus* in a characteristic leap. The Family of Sail Fishes, *Istiophoridae*, is closely related to the extinct prehistoric Family of *Palaorhynchidae*.

There are only a few species in the Family, all large and of brilliant, metallic colouring. All have the upper jaw prolonged into a sword-like process of consolidated bones, feeble teeth, and the ventral fins reduced to two or three rays.

*Istiophorus* has a tall, undivided dorsal fin carried high like a great sail—hence the popular name. Since the "discovery" of the Sail Fish in the 1920's as one of the showiest and toughest of fighting game-fishes, it has achieved high popularity among salt-water anglers in America.

*I. americanus* is found in American waters and *I. orientalis* off Japan. The same Family includes the Genus *Tetrapturus*, the Spear Fish, which differ from the Sail Fish in having a much lower, and divided, dorsal fin.

JOHN WAKEFIELD

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N. E. Perkins' rock garden, showing the initial pondside planting.

## MAKING A WATER GARDEN (3)

by N. E. PERKINS

Illustrated by Laurence E. Perkins

**I**T SOON became obvious that the rockery in my newly-made water garden could not be adequately planted with the usual rock-plant without considerable expense and, since the usual method of planting small pieces and waiting for them to develop would have left bare patches for a long time, I decided to use such quick growing and brightly-coloured plants as lobelia, salvia, mimulus, purple asters and coleus, placing such permanent rockery types as I could afford among them.

The mimulus are decidedly worthwhile, especially the large type, usually treated as an annual. These, if given good drainage and plenty of water, will flower continuously and produce anything up to 500 large blossoms somewhat similar in shape and texture to gladiolus but of an orange, yellow or red coloration, usually blotched with chocolate markings.

Right through the Summer these plants never had less than 20 blossoms on each, and although the blossoms fall rather quickly they are continuously replaced. The salvias grew rather large for the rockery, but their vivid scarlet contrasted well with the Cambridge-blue type of lobelia and provided a fine splash of colour. As my rock garden can be considered complete without a few of the dwarf conifers for they had character in Summer and provide a range of colours from dark blue-green to pale yellow in lightest the drab days of Winter. Of these

Juniper communis compressa, a popular slow-growing Conifer, ideally suited for positioning in the rockery pond surround.



some of the best are—*Chamaecyparis obtusa nana gracilis* (a fine bushy little conifer of a very rich green colour), *C. lawsoniana Ellwoodii* and *Fletcheri* (two rather similar types but of differing shades of blue grey), *Thuja orientalis Rosadalis* (a pale green sort which develops into a compact ball or globular shaped tree of about 15 to 18 in. in height), *Chamaecyparis pisifera plumosa aurea* (a pyramidal tree of a very pale green, the new shoots being bright yellow), *Picea albertiana conica* (the "dwarf Christmas tree"), *Juniperus tamariscifolia* and *J. prostrata* (two fine types that will project horizontally outwards over the pool), *J. communis compressa* (a very slow-growing pyramidal type), *Thuja occidentalis pectinata* (somewhat similar to the last but bronze in winter) and, finally, one not strictly a dwarf but slow growing and worth a place for its beautiful pale blue glaucous foliage, *Picea pungens glauca Kosteriana*.

I am very fond of these types and have well over two dozen different varieties, including those mentioned, but they are comparatively expensive so that, if cuttings are obtainable, it is worth while attempting propagation although they take a long time to make root and should not be disturbed for 12 months. One secret of success with these trees is frequent spraying of the foliage and, of course, plenty of water all the time, though most require good drainage.

#### Breeding Activity

Although no special preparations had been made for the breeding of the fish (in fact it had been realized that such an event would probably retard the progress on the garden) the warmth of the upper pool, coupled with the numerous feeds of Earthworms found whilst digging, resulted in a general activity in this direction among the fish. As it would have been impossible to handle broods of several varieties, the Celestials were chosen and carefully hand-spawned to give two distinct crosses.

A young male born in 1955 was crossed with his mother and then again crossed with his sister. The ova were treated rather carefully but, nevertheless, the resulting fry numbered over 200, quite sufficient in the circumstances. As these developed, it became increasingly clear that the interest in Goldfish breeding is not a matter to be laid aside easily, the innumerable aspects of the hobby providing ever new points of interest. The male fish used was the same in both cases and the three fish employed conformed to standard, two being the young of perfect specimen parents.

As the fry developed it was very noticeable that the percentage of quality fish was going to be very much greater, from the mother to son mating than from the brother to sister

pairing. In fact, within a fortnight, three-quarters of the latter fish were destroyed as being either single-tailed, possessing vestigial dorsal fins or twisted finnage, whilst of fish of the other pairing only one had a single caudal and only one showed any sign of a dorsal fin and this a small single spine. Later it became evident that about 50 per cent of the mother-to-son bred fish would be partially web-tailed but even so this left well over 45 per cent of very reasonable specimens as regards body, shape and finnage. At present their eyes are beginning to turn upwards, but it will be impossible to make a proper assessment, of course, until they are at least six months old.

So once again the main interest revolved around the fish for with the advent of the young preparations had to be made to winter them and this required the construction of a fishhouse. However, the possession of a greenhouse, even though it be given over mainly to fish, will be more than useful in preserving some of the less hardy of perennial plants, such as the blue African Lily (*Agapanthus*), the Chilean Flame Bush (*Embothrium*) etc., and also in producing



Mimulus, used to get colourful planting effects.

suitable annuals at an early date. Moreover, since a pump must eventually be installed to operate the waterfalls between the two ponds, a suitable transformer to lower the voltage to a safety level may also be housed here.

The work on the garden so far as has been mentioned was completed in nine weeks, a surprisingly short time, and certainly in no way possible without the pre-conceived plan. Larger shrubs and trees could not be dealt with at this period (June) owing to the seasonal time of lifting, but at least we had a very pleasant vista for the remainder of the Summer.

As time and funds allow larger shrubs and trees will be planted, the positioning of these being guided by the initial idea of giving an impression of space, and destroying the characteristic squareness of suburban gardens. Types already listed as desirable include Magnolia,

Hibiscus (flowering cherry), a variety of azaleas and rhododendrons, one or two larger conifers, such as *Chamaecyparis lawsoniana albiflora* and *Sisowarii*, and some of the rarer evergreen shrubs.

Eventually it is hoped that a dwarf wall with an inwardly projecting slate top may be constructed right around the garden so that moss reptiles and batrachians may be released to augment the existing interest. Most of these

creatures are invaluable as garden pest destroyers though some may have to be avoided because of their ravenous mating calls which would not be well received by neighbours.

As time passes various alterations may have to be made, both as regards the garden shrubs and the water plants, but at least a pleasant framework has been constructed which will readily lend itself to development whilst at all times providing interest to the nature-lover.



## BOOKCASE AQUARIUM

By R. L. BROOMFIELD

ORIGINALLY a two-tier table, the bookcase combined glass and aquarium cabinet illustrated was modified by adding the bookshelves and facing with walnut ply. The total cost was £6.

For feeding and servicing the aquarium the top lifts on two hinges. The aquarium is of the orthodox 24 x 15 x 12 in. dimensions and is tropical. A strip light is used for lighting and, to prevent the heat from the light cracking the glass tank cover, I have made two brackets which rest on the angle iron in the centre of the tank about 2 in. below the cover. Two pieces of cover glass are used and as they lean downward this makes the water rim run down back into the tank.

A grey stone paper background is employed and this has been stuck to cardboard to enable me to bend it away from the centre to give the fish a greater appearance of depth.

Fishes kept are of the smaller varieties, including Harlequins, Glowlights, Neons, and three boisterous Tiger Barbs, and *Leuciscus asotus* Catfish as a scavenger.

The plants I mainly use are Cryptocorynes of which I have six types. The reason I use them is that they need very little attention, compared with some other plants such as the Indian Fern which is also included and which needs thinning quite often.

I do not use a filter or an aerator, but I find that if I siphon off about a gallon of water each week the tank keeps very clear.

Bookcase aquarium cabinet, adapted by R. L. Broomfield to present tropical fishes in a decorative fashion. The tank has a good variety of plants.



## Fungus Disease in the Guppy

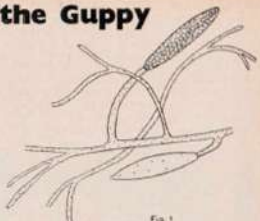
By R. E. ISON, B.Sc.

OF all the diseases which attack the Guppy one of the most obvious to the naked eye is that due to the fungus *Saprolegnia*. *Saprolegnia* is a member of a large group of plants known as the fungi. It is commonly met with in fresh water, where it can grow either on dead or living animals and plants, and hence is often called "water mould".

The plant consists of a dense mass of branched tubular filaments. Some of these filaments, or hyphae, are short and penetrate the tissue of the fish, while others are long and extend out into the surrounding water (Fig. 1).

The most usual method of reproduction in *Saprolegnia* is by the formation of non-sexual spores. The tip of a filament enlarges slightly and is partitioned off from the rest of the filament by a transverse wall. The contents of the chamber or sporangium thus produced become divided up into pear-shaped spores which bear two flagella, long thin processes used for locomotion, on the narrow end (Fig. 2). These spores are shed to the exterior through a pore which forms at the tip of the sporangium. The spore swims freely for a short time but eventually comes to rest, the flagella are absorbed, the spore rounds off and finally secretes a thick wall around itself.

Inside the spore a new, kidney-shaped structure is produced which has two flagella attached to its concave side (Fig. 3). This new spore escapes through a hole in the old spore case and after a short free-swimming life, comes to rest on another fish or plant, rounds



off, secretes a wall, and germinates to produce a new filament. Sexual reproduction also occurs in *Saprolegnia*, a resistant spore being produced which is able to infect a fish at a much later date. The fish is made susceptible to *Saprolegnia* by having poor conditions, which are often produced in the first instance by overfeeding. The food that the fish does not eat falls to the bottom of the tank where bacteria of decay break it down, thus releasing poisonous substances into the water.

These poisonous substances have the effect of lowering the resistance of the fish to bacterial attack, which as a consequence easily infect the fish causing abrasions to occur on the skin. These abrasions are areas of weakness in what is normally an efficient protective layer, and form suitable points of entry for the fungal spores. Once established the spores germinate rapidly.

#### Look at the Environment

From the account given of the course of the disease, it can be seen that to rid a fish of the Fungus without rectifying the adverse environmental conditions is not likely to prove a permanent cure. The fish should be removed from the tank and allowed to swim in a one per cent salt solution (one gram of salt dissolved in 100 cu. cm. of water or approximately 1 1/2 ounces in one Imperial gallon) for 10 to 15 minutes. It has been found that this solution, while killing the Fungus does not harm the fish, although it is not advised to keep the affected fish in the solution for more than 30 minutes.

The tank meanwhile should be thoroughly cleaned, sterilized with Condy's fluid (potassium permanganate, obtainable from a chemist in crystal or liquid form) and refilled with fresh water. The unaffected fish can then be replaced while the diseased fish is kept in a separate tank until completely cured. Phenothol compounds are now also widely used for the effective treatment of this disease.

AMONG the many controversial questions that crop up when aquarists meet is the role of scavengers in a tank. Any community would soon come to grief without the aid of these humble but valuable members. The business of clearing up bits of uneaten food, dead plant leaves, dead fishes, etc., in aquaria is carried out by three groups of individuals: snails, catfishes and the aquarist himself.

All have their value and their limitations. Not even the most enthusiastic aquarist can remove every bit of uneaten food and clear every plant leaf of fine algae growth from his aquarium. On the other hand, even an army of snails and Catfishes will not properly and adequately clean the front glass of the tank for a lay aquarist. Let us consider each member of the scavenger group and see how they may be best employed.

Firstly snails, which some people regard as pests. They maintain that they are unsightly, breed too freely, that they disfigure and eat up valuable plants and their excreta make a worse mess than the debris they are supposed to clear up. They will also eat up fish eggs.

Now there is no doubt that snails should not be allowed to get into a spawning tank or a large number of the eggs will be lost, but in a community tank containing adult fish or, in a spawning tank once the fry have become free-swimming, I can see no objection to having a



By DR. F. N. GHADIALLY

reasonable population of snails to lighten the task of the aquarist.

When conditions suit them they certainly breed prolifically, but that is no argument against their use. When I find the snail population of a tank rising, I just squash a few against the front glass of the aquarium. The fishes soon eat up the soft parts and leave the shells behind. This is a quick and easy way of reducing the snail population in a tank in a few days and at the same time providing valuable fresh food for the fishes.

Incidentally, snail eggs are first-class food relished by most aquarium fishes, so the snails serve a further useful purpose in an aquarium. The contention that snails make more mess than they clear up cannot be seriously entertained. It is, of course, quite absurd to suggest that any creature can excrete more than it eats. A fair amount of what is eaten is retained by the animal, and only indigestible waste material is excreted. Snails break down dead and decaying organic matter and what they excrete forms valuable plant food.

#### Conditions for Rapid Development

Naturally, if there is a lot of decaying matter in the tank, such as unhealthy plants or an unusually large amount of uneaten dried food lying about, then snails feed ravenously, multiply prolifically, and snail excreta may be seen.

One can hardly blame the snails for these conditions, they are just working overtime to help the aquarist who has not yet learnt the elements of good aquarium technique. Without their help the tank would have been grossly polluted earlier.

The one and only serious objection to snails is that they do destroy certain plants; Indian Fern is a classic example. It is virtually impossible to grow specimen plants of Indian Fern where snails are abundant. I do not believe, however, that snails (we are here talking about Ramshorn snails kept by most aquarists and not some pond snails which are



Side view of *Plecostomus plecostomus*, a sucking disc on its mouth. Note the fish's sucking disc. Photograph, G. J. M. Timmerman.

quite destructive to plant life) will wantonly destroy plants such as *Fallisneria*, *Cryptocoryne* or Amazon Sword Plant. They will attack dead leaves of these plants and will only eat healthy leaves when they are really starving.

The situation is easily remedied by reducing the snail population by squashing as described previously so that the remaining few snails have ample food available.

Far from being harmful to plants I feel that it is virtually impossible to grow good plants where no snails are present. Snails scrupulously and meticulously keep the surfaces of plant leaves free from debris and algae which tend to choke the plants.

Thus, on the whole, one may conclude that a few snails are an aid to good plant growth; they keep the leaves clean, and their droppings fertilize the plants.

Malayan Sand snails, which spend most of their time in the gravel, serve a further useful purpose by keeping the gravel sweet and healthy. They do not destroy plant roots. Their population is more difficult to control, however.

Another argument against the use of snails is that they increase the hardness of the water. This erroneous idea has arisen from the fact that snail shell is rich in lime salts. A dead snail or crushed up bits of snail shell will gradually dissolve in the water and increase the lime content of the water, but a live, growing snail will, if anything, extract calcium from the water to build its shell. Siphoning off a collection of dead snails lying on the gravel is thus a means of removing calcium from the water to build its shell. Siphoning off a collection of dead snails lying on the gravel is thus a means of removing calcium from the water to build its shell.

The whole problem is highly hypothetical as most specimens of aquarium gravel contain large amounts of lime salts and dried foods, incorporating as they often do, shrimp, meat meal and fish meal, also contain plenty of lime salts.

### Sorting out Rasboras

IN November we referred to a *Rasbora* species new to this country. What appeared to be the same fish was called *Rasbora steineri* and *R. borapetensis*. *Rasbora steineri* Nichols and Pope (originally named *R. cephalotaria steineri* in 1927) is the only *Rasbora* species so far discovered in S. China. Nichols and Pope describe the living fish as "olive-greenish above and on the sides, silvery below. Fins olive-tinted, ventrals pale. A sharp black stripe from head to notch of caudal fin". *Rasbora borapetensis* was described by H. M. Smith in 1934 as coming from Central

So I think it is rather unfair to blame the snails for making the water hard when there are so many other things that can be responsible. Snails like hard, alkaline conditions; in acid waters their shells become pitted and they ultimately perish.

One or two small Catfishes (*Corydoras*) are a must in any worthwhile community collection of fish. They are good scavengers and extremely interesting creatures to watch. Playful, harmless, peaceful, molesting nobody and being molested by nobody, they are indeed ideal aquarium inmates.

### Clearing Ureates Food

Their continuous activity keeps the top 4 in. of gravel clean. They will root out unaten White Worms that have wriggled under the gravel where they would die and cause pollution. They are most effective in clearing out *Tubifex* which have established themselves on the aquarium bottom. These jobs cannot be done easily and effectively either by snails or by the aquarist.

They will not clean plant leaves, though, (except the algae-eating Catfishes, *Otocinclus* and *Plecostomus*)—that is best left to the snails. The algae-eating Catfish are somewhat difficult to keep alive for any length of time, once they have cleaned up the algae in the tank. That snail excrement is produced in any single tank to keep even one of these Catfishes for long. That has been my experience, at least, but I know some who have had better luck with these fishes.

It may seem strange to list the aquarist as a scavenger, but that is one of his major roles! He must remove dead fishes and dead plant leaves so as not to tax the natural scavenging processes too much. He must also clean the front glass of the tank, for unfortunately neither snails or Catfishes will do this for him. He should occasionally siphon over the bottom of the tank to remove muck or an accidental addition of too much food or some food which the fish have refused to accept.

Siam. It is detailed by him as "pale yellowish-green above, silvery below, with a black stripe down the side, bordered by a grey-gold stripe along its dorsal edge; this pattern is accentuated by a carmine coloration of the basal part of the caudal".

From these descriptions it would seem that some of the fishes in Britain, at least, are of the *R. borapetensis* species as they have the golden body stripe and the red in the tail fin. There is also the possibility that the less colourful *R. steineri* came in to this country at about the same time.

## 1957 IN RETROSPECT



The author, right, with H. R. Holland, left, judging last year's Corby A.S. show. Also in the picture is D. Atkins, Corby's chairman for 1957.

### Lessons we can learn from last year's exhibitions

by C. W. G. CREED

AS the new year dawns it is an appropriate time to look back on 1957 and think how our experiences can be useful for the future. The aquaria shows in 1957 are worthy of some consideration and I hope that the showmen and lessons learnt from them will be of use to exhibitors on subsequent occasions.

Twelve months ago the number of scheduled shows was very small and it looked as though 1957 would be a very lean period but, as the year passed, more exhibitions were announced so that, in the end, they appeared to be back to normal. From murmurs overheard, the exhibiting societies were generally able to make them pay.

I think that clubs in the past have tended, either to arrange their shows without adequate planning of dates, or to plan too many in one year. Further, the exhibitions have become too stereotyped from year to year.

In consequence, unless the visitor is a keen aquarist, after a second journey to a show which has a similar layout to the previous occasion, he is not encouraged to make a third visit.

We must aim to draw the public to a show by making it as attractive as possible. With this object in view several clubs have gone out of their way to include specific fish or some other special attraction to act as a centre piece and to be included in their advertising. Most

of the clubs that have had this added display have found that it has paid dividends.

I think that the time has come for clubs to view shows from a different angle and analyse those that are staged on the Continent. For example, in Holland the clubs unite in any one area and pool their resources and they do not arrange shows annually but possibly every two or three years.

These methods have their advantages. Preparations can be spread over a longer period and the work of assembling is distributed among more clubs so that the tasks do not fall on a small band of workers. In addition, financial worries are spread over more than one club. As there is only one combined show, it means a greater attendance because the visitors come from a wider area. A lot of work usually goes into an exhibition, and set-ups can still be used to make an attractive set-up which will last for two weeks or so without very much extra work. Lastly, better attendance means better recompense for the labour put into the show.

I know that a show of longer duration means the possibility of more money being required before-hand and also that more help will be required for stewarding, etc., but when two clubs unite there is more finance and more members are available.

How has the number and standard of the

fish in shows in 1957 compared with previous years? Although the number of entries may have been down in some instances, the majority of shows reported events equal to past years; in fact, some have had to turn away exhibitors.

This is encouraging, because it no doubt means that the support has come from a rather smaller number of fishkeepers.

The quality of fish on view has gone up very considerably, which infers that the aquarist is looking after his fishes better, and this is a good omen for the future. In past years we have seen some good fishes staged with a majority of medium to poor quality, but now it is the other way round, some of medium quality are being staged, but the majority are good fish.

These medium grade exhibits are generally staged by a newcomer who is making a debut into the exhibition world, and, in consequence, is just feeling his way. The result of this higher standard has been that the judge's task has been very much harder, but considerably more enjoyable by seeing whole classes, and usually large ones too, of entirely good quality fish.

A plea, now, on behalf of the judges. We do like to make a good job and to do justice to all the fish that are in the show, but when there are large entries, and these are not ready for the judges when they arrive, then the judges have to condense their tasks into the short time allowed so that the show can be opened to the public at the appointed time. It is important that a reasonable period should be allowed for the judges to do their job.

Possibly fish benched overnight ready for the judge the next day is one of the best arrangements, as it allows the judge more time and fish have an opportunity to settle down in their temporary homes and are able to do themselves and their owner, full justice.

The single fish classes are still popular, but why not a few pairs classes so that the public can see what the male and female of the species look like? This is very helpful, especially with those fish where there is a good deal of difference between the sexes. The aquaria can always be divided if the exhibitor wishes.

Last year, selecting the "Best fish of the show" was frequently a real headache because there were so many high standard fish with equal pointing, or very close pointing when two or more judges were operating.

When only one judge is officiating the pointing is a definite guide, but where there are two or more it is not always the direct answer, because judges are human and have not yet reached the electronic age of each and every one turning out identical points for the same fish! So usually it means a prolonged

conference with plenty of discussion, with possibly each judge not prepared to give way very easily, but finally an agreement is reached.

I have noticed that in 1957 one or two fish have been fortunate in taking the premier awards in more than one show. Does this mean that good fish are harder or tougher, or is it that they have been trained for showing?

The set-up furnished aquaria have mainly been of a high standard so far as the quality of the fish and the plants is concerned, but the general arrangement of the aquaria can still be improved. Something different from the stereotyped version can be achieved with a little more care, maybe in the different arrangement of plants or rockwork.

### Blending the Rockwork

Here I would mention that when choosing rockwork a little extra thought so that it blends with the base material will give a very much improved appearance. One club has a cup for the exhibitor gaining most points in the furnished aquaria, excluding the 50 given for the fish and plants. This does encourage more care in the arranging.

Now as regards the best-in-show fishes, a Piranha was in this position more than once, and just missed top honours on several other occasions. This fish has been consistently in show condition—a remarkable achievement. Another I would like to mention is a Paradise Fish which was the best specimen of this species that I have seen since the war.

A Blue Gularis, which is a rather more delicate species, has been in the leading awards several times and the owner must be complimented on the excellent way he has managed to stage it each time. At another show there were two good fishes at extreme ends of the fish price scale, one a Pompadour Fish which, for all its so-called delicacy, was shown in perfect condition, and the other a Common Goldfish which only escaped taking the premier award because of slight scale damage on one side. This Goldfish has now been shown for several years.

So let us look to the future with the aim of showing still better quality fishes, of arranging a show that the public will want to come to another year, of testing the judges still further with good fish. These achievements cannot come about by leaving the work to a few individuals, however.

The current show season ends with this paper's Olympia show in January and here can be seen the largest entry of club furnished aquaria staged anywhere and also very good breeders' classes. Every fishbreeder should aim to show his fish in breeders' competitions and win, but even to enter in the breeders' class is a worthy achievement.



Photograph by G. Kinnis

## PICK OF THE PETS

### No. 2. THE GRASS-SNAKE

by ALFRED LEUTSCHER, B.Sc.

SNAKES have a fascination all their own. Whether a person likes, hates or fears them he is almost certain to be curious. Much of this curiosity can be satisfied by keeping a harmless and hardy snake.

Our native Grass-snake (*Natrix natrix*) should fill the bill as it is easily tamed, quite unobtrusive and easy to keep. It may be caught wild in this country or bought from a pet shop. The latter specimens are usually the Continental variety imported from Italy.

A snake's health may be largely judged from the condition of its skin. This should be dry and soft to the touch and reveal a kind of grape-like bloom shining through the normal colouring. The skin should also slough cleanly, almost in one piece. Blistered or patchy skin areas where the creature has dirty or wet surroundings. The snake then appears beaded, sloughing is interfered with, and bacterial colonies rapidly invade the scales and mouth, causing sores and swellings. The snake goes off its food and wastes away. To avoid this condition it is a good idea to keep the snake's cage perfectly dry, the only water being contained in a shallow bowl.

The home can easily be made out of wood and glass. Construct a box frame of one inch square, two feet square by 18 in. tall. Fill the sides and front with sheet glass, the back with boarding and the roof with perforated zinc into which is fitted a small trap door. Through this door food can be introduced or the pet removed. The snake will also stand less chance of escaping should the door be left open.

This box cage fits on top of a wooden tray, about six inches deep, filled with dry material such as broken peat, leaf-mould or sand. On to this mixture scatter clumps of dried moss or leaves, a few branches, a flat rock to make a sunning platform, and a clump of dried heather through which the snake can crawl when in the act of sloughing. The water bowl in one corner will be used for drinking, also for an occasional bath, especially before sloughing.

A simple hiding place can be made out of a can of rockwork or some bark. If living plants are desired then these should be growing in their pots, placed in drip trays so as not to dampen the cage.

### Easily Tamed

Grass-snakes will become very tame, even taking food (which has been freshly killed) from the hand. In nature they feed on cold-blooded prey for choice, such as frogs and toads, newts and freshwater fish. Sometimes fish in garden ponds are attacked. The Grass-snake is an expert swimmer.

Should the female be suspected of carrying eggs, a special incubator can be prepared. Place inside the cage a tin about four inches deep, filled with damp leaf-mould or peat, and remove as soon as the eggs are laid. Place the tin in a steady temperature of about 75 deg.F. The eggs should hatch in about 10 weeks.

In dull weather or poor Summers a suspended light bulb which hangs a few inches over the sunning stone will prove beneficial. Where a sunlit window space is not available, the light can be switched on when necessary.



Harlequins (upper fish), the most well-known Rasbora species, share a tropical community aquarium with Tiger, Rosy and Schuberli Barbs and Australian Rainbow Fish. Photograph, R. Skipper.

## TRY YOUR SKILL WITH RASBORAS

Lovely tropicals that have proved fickle in the breeding tank

by BETTY ROBERTSHAW

THE popularity of the various aquarium species of *Rasbora*, with the exception of the Harlequin Fish, seems to be at rather a low ebb just at present, although they form a most interesting group of fish. In addition to the few species in good regular supply, several others are available from time to time and, in the last few years, we have had in this country *R. urophthalmi*, *R. vaterifloris*, *R. hengeli*, *R. stielneri*, *R. borapetensis* and two other species at least which are not usually listed in aquarium reference books, but all of which appear to have the same admirable qualities as their better known relations.

Rasboras are typical minnows, well streamlined and active, the various species exhibiting a pleasing range of markings and colour. They are not usually shy and seem to live and thrive in any water as long as it is kept clear and fresh and the tank is well planted. Although omnivorous, these fishes appreciate a large proportion of livefood in their diet and a temperature of rather over 75 deg.F. is preferred. When several of the same species are kept together they shoal, and this is a definite asset to any furnished aquaria set up with decorative intent.

Breeding in the home aquarium is, however, quite a different matter which has long presented a challenge to aquarists. Successes are very infrequently reported and detailed information about the spawning of individual species is often non-existent.

In their natural surroundings most of our aquarium Rasboras are reported to occur in quite large shoals, which would lead one to believe that they are prolific breeders in the wild. This anomaly has produced interesting speculations from time to time regarding particular conditions of water acidity, hardness, and mineral content which may have a good deal of bearing on the problems encountered when attempting spawnings, and nowadays shoal spawning is nearly always advocated. Of the species in my collection *R. maculata*, *R. heteromorphus* and *R. pauciperforata* have been bred with some degree of success.

*Rasbora maculata* responded readily to a simple set-up in the breeding tank. The bottom layering was of well-washed peat, and the water used came from the tap, although tap-water was passed through a commercial water softener using a base exchange resin which, whilst softening the water considerably

in terms of hardness, still left a high mineral content.

The spawning medium consisted of two or three unplanted *Cryptocorynes* just thrown into the tank. One pair of fish only was used and spawning commenced the following day, the female swimming into the plant roots closely followed by the male.

For a short time they took up a side by side position and there was a good deal of trembling. Then the male twisted round the female from the underside and immediately broke away. In this type of dark, set-up tank close observation is very difficult and no eggs were actually seen being deposited. Eggs could be noticed on the plant rootlets, however, and it is assumed that they were laid in this manner. The parent fish were left in the tank for three days, and each day further spawnings occurred.



The shy *Rasbora maculata* species with which Mrs. Robertson achieved success in the breeding tank. Maximum adult size is only one inch.



The bold black wedge-shaped marking and pinkish gold colouring characterise the popular Harlequin fish. Photograph, G. J. M. Timmerman.

At this time some fry were seen sticking to the glass in the very darkest back corner of the tank and the parent fish were removed. On test, the water then registered pH 6.7 and hardness, 50 p.p.m. *Rasbora maculata* were subsequently spawned several times and through three generations in this manner.

The adult fish were eventually left in the tank for up to a week at a time, laying eggs each day, and the largest number of fry raised from one tank was 56. When free-swimming, the young fish were fed a patent fry food along with very fine newly-hatched Brine Shrimps

which they took readily within two days. In view of the small size of the parent fish this was a surprisingly early stage to expect Brine Shrimp to be taken, but the youngsters grew very rapidly and were adult size at three months.

The Harlequin Fish, *R. heteromorphus*, stubbornly resisted any attempt to trigger off a spawning for many months, although apparently in excellent condition and extremely happy in the varied set-ups provided for them. Eventually a shoal of six—three males and three females—were put together into a tank with washed peat for bottom layering, rainwater, and a small dish of *Apogonatus* seedlings for the spawning medium. The leaves of the *Apogonatus* were arranged so that they arched towards the water surface and some of the length lay just under the surface, in a manner designed to copy as closely as possible the growth of the *Cryptocoryne* plants they are reputed to prefer.

The plan was that the very soft rainwater would gradually acidify through contact with the peat and the fish would have the opportunity of adjusting themselves slowly to the change. In the meantime they could be observed for signs of spawning or possible distress.

After five days spawning commenced. At first it was thought that this was a shoal spawning, but it became very clear, after a short time, that only one pair was actually breeding, although all six were busily engaged in devouring eggs. This is a habit not usually mentioned in reports of Harlequin spawnings.

### Position of the Female

The female fish did turn upside down underneath the leaves as expected, and after a while the male followed her; they came into a side-by-side position and several eggs were extruded at a time. Of all the eggs seen to be laid only one stuck to a leaf and the rest fell. Whilst falling through the water they were pounced upon and eaten in the most enthusiastic manner by both the parents and the other fish, although those that reached the bottom of the tank were completely ignored.

It was estimated that at least 70 per cent of the eggs laid on this day were lost as fish food! However, the tank was blacked out after a few hours of spawning, fish and eggs being left together and, after 24 hours, the blackout was removed. Under sudden strong light young fish spiraled down from the surface and there appeared to be no eggs left unattached on the peat. In view of the fact that moving eggs had been such tempting food, it was decided that it was expecting too much of the adult fish to ignore active youngsters and the six adults were therefore removed.

(Continued next page.)

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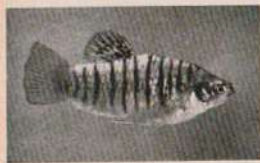
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The water at this time registered a pH of 5.5 and was, of course, only about 10 p.p.m. hardness. The next question was what to do with the adults so that they would be subjected to the minimum amount of shock in changing water. Other soft water was available at the time but not of anything like the same acidity. They were eventually put into an empty tank containing only rain-water and, for some reason, a floating cork.

Spawning immediately re-started under the cork and it proved to be the same pair. The

other four fish were again moved, this time into hard water out of the way, and the actual spawning pair was moved from tank to tank whilst egg-laying continued over a period of two weeks or so with the interruption of the odd day. In the first tank 12 fish were raised and, all told, 90 were raised from the complete spawning, many eggs being eaten. The youngsters took Brine Shrimps as a first food and grew very rapidly for the first two months.

(To be continued.)



Male Hump-backed *Limia* (*Limia nigrofasciata*).

## Current Importations

Old species reappear and interesting new ones become available

by P. MILLET

SINCE 1945 so many new fishes of aquarium worth have been imported that some of the established pre-war favourites have disappeared from the market to such an extent that the younger aquarist has never even seen them.

In some cases this is due to the fact that the fishes themselves have faults, such as fin-nipping, that bar them from the community tank as might be the case with the now rarely seen Buenos Aires Tetra, *Hemigrammus caudovittatus*, but in other cases the fish have disappeared merely because more novelties and more showy fish have been made available.

One of these almost forgotten species, the Black-banded or Hump-backed *Limia*, *Limia nigrofasciata*, has appeared in a recent import. This livebearer, from the Republic of Haiti, though not particularly showy, has certain interesting features. The male changes its shape in a remarkable way as it approaches maturity. When about 12 months old this black-banded yellowish fish begins to develop a pronounced hump on its back and, at the same time, the growth of the dorsal fin is increased so that, when in prime condition, the fish has a quite spectacular appearance.

The female of this robust species reaches about 2½ in., while the more showy male is about 1½ in. shorter. Like most livebearers, Hump-backed *Limias* are easily bred at a

temperature of around 75 deg.F., and can produce up to 30 young at a time, though its near relative, *Limia vittata*, has been known to drop 300 youngsters on a single occasion. Surely a record for a livebearer?

Another *Limia* is included in the same consignment. This fish, marketed as *L. arnoldi*, is presumably the so-called Blue *Limia*, *L. caudofasciata*, from Jamaica. This *Limia* which was also known to us before the war, is not really blue, but has blue-edged scales that reflect the light giving it a very attractive addition to a community tank.

As in most livebearers, the female is the larger and less colourful fish, and the male can be distinguished, not only by his gonopodium, but also from the fact that he shows a more vivid colouring to his orange dorsal fin. The fish is easily bred, but care must be taken to protect the young from their parents, which show a strong disposition to eat them.

An attractive new *Hypheosubercon* that is "different" has arrived from South America. This fish, at present offered as *H. priami*, has a similar body shape and finnage to the Flame Fish, and the specimens so far seen are about the same size as the Flame, though it is not yet known whether these are adult fish.

*H. priami* has a distinctive brilliant red caudal fin, a white edge to the anal fin, and it has a black and gold spot on each side with two

faint vertical dark bars, like those of the Flame Fish, just in front of these spots. The abdomen is suffused with gold and the body behind the vent is semi-transparent. This fish is doing well under the ordinary conditions enjoyed by Tetras. No sex distinctions have yet been observed.

### Another Danio

Another novelty is on offer as "Danio Kerry". It has features that remind one of all the other *Danios*, so much so that one would be excused, perhaps, for taking it for a hybrid between *Brachydanio nigrofasciatus* and *B. albolineatus*. It is, however, a true species that has been known to science for some time as *Brachydanio kerryi*.

Its home is Siam where it was first found in 1929 by a Dr. Kerr for whom it was named. It is about the size of a Zebra Fish and has a dark blue line running along its side from head to tail. Above and below this line run parallel lines of reddish gold. The general colour is similar to that of the Pearl Danio though the whole fish is covered with a blue-gold sheen. The female is said to be bluer than the somewhat greenish male.

This fish has been bred in Germany, and reports suggest that no difficulty should be experienced provided that the usual *Danio* breeding methods are employed. It is an attractive species and should prove a welcome

addition to the tropical community tank.

A rarely seen Characin of character is available in small quantities. This fish, *Aequidens microcephalus*, though no newcomer, is so infrequently come across that it deserves mention. Known as the Chocolate Head-stander, its coloration is rather sombre, but its distinctive markings make it a dignified addition to a tank of similarly-sized fishes. On occasion it will eat certain decorative aquarium plants and has been known to make a close cropped lawn of Hair-grass!

To a large extent, however, this habit can be prevented by supplying the fish with a plentiful supply of Duckweed. Like most of its Family it is not too difficult to keep so long as one remembers that the Characins are predominantly carnivorous creatures and need a large proportion of live or meaty food in their diet.

### Whiptail Catfish

A small import of *Loricaria parva* from the Continent is of interest for these are aquarium bred. The breeding of these Paraguayan mottled catfishes under aquarium conditions is rarely reported, but perhaps it is because very few aquarists keep single species of Catfish by themselves, and living on the bottom of a crowded community tank can be scarcely conducive to the successful breeding of these interesting fishes.

## READERS'

### PICKING UP MIKRO-WORMS



Feather cut ready for use.

10s. 6d. is paid for each published letter received from a reader.



WHEN I had to be away from home for a period I asked my wife to feed some fish fry with Mikro-worms. For this purpose she used a feather, an arrangement which I have found much more efficient than the usual knife or razor blade.

Later I cut the feather as shown in the sketch. The feather is supple and masses of worms cling to it. Even on the surface of the culture medium the feather collects large numbers of worms with very little of the culture medium adhering. (W. SICAL, Ancey, Haute Savoie, France).

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## Cryptocoryne griffithii

by Dr. H. C. D. de WIT

IN the last issue I wrote about the natural surroundings of *Cryptocoryne beckettii*. It appeared that flowering might only be expected if the plants were grown out of water and in a swamp environment.

It could be assumed that another, very commonly kept species, *Cryptocoryne griffithii*, would require similar conditions, but I have found it impossible to grow *C. griffithii* out of water. The leaves never rise above the water surface, however low it may be and, if the water evaporates entirely, the leaves lie flat against the planting medium.

Flowering may then occur, but the plants flower just as easily if completely submerged. It seems that a rather large amount of light and a temperature between 22 deg. and 28 deg. C. (72 deg.-82 deg. F.) are required.

Actually the species of *Cryptocoryne* may be arranged in two groups, one flowering only, or at least at its best, out of the water (e.g., *C. beckettii*, *C. versteegii*, *C. nevillei*, etc.) and the other only, or preferably, when wholly or mainly submerged (e.g., *C. griffithii*, *C. affinis*, *C. longicauda*, etc.).

### Connection with Habitat

Recent research leads to the belief that some characters in the anatomy of the leaf are correlated to the natural habitat. *C. griffithii* Schott is one of the most commonly kept and most frequently flowered *Cryptocorynes*. The shallowly heart-shaped, blunt leaves (blade 5-10 cm. (2-4 in.) long and 2½-5 cm. (1-2 in.) wide) are velvety, grass-green, without conspicuous lighter coloured veins.

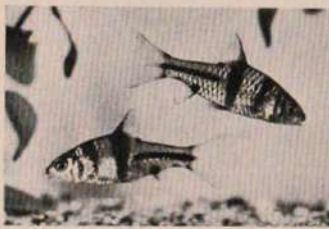
When young, however, the leaves are very often transversely striated or webbed by delicate purple lines and sometimes also lengthwise by purple veins. In strong light the lower surface of the leaf may retain some purple markings, but the upper surface loses all purple colouring in time. *Cryptocoryne maculata* is a trade name, as a rule used for young plants of *C. griffithii*.

The petioles of *C. griffithii* may reach a length of 15 cm. (6 in.) or even more and, of the species occurring in our aquaria, this one is among the largest and is very suitable for background planting. Its massed leaves form favoured haunts of many fishes; the Harlequin Fish, *Rasbora heteromphala*, is known to spawn readily on its broad, somewhat wavy leaves. The plants thrive in any aquarium soil and are made beautiful by the silky sheen they possess.

The flower appears as a narrow, white, purple-tinged tube, 10-15 cm. (4-6 in.) long, which widens below to form a cylindrical, nearly 2½ cm. (1 in.) long, "kettle", and ends on top in a purple, penant-shaped limb which is 2-2½ cm. (1 in.) in length, including the tail. If the flower opens and flattens, the warty or wrinkled inner (or upper) surface of the limb and the yellow "throat" (or inner wall of the top part of the tube) becomes visible. To obtain an open inflorescence, it is advisable to lower the water level well below the top of the flower and to keep the temperature of the water and the air at least 24 deg. C. (75 deg. F.).

*Cryptocoryne griffithii* is found in most parts of the Malay Peninsula, in marshy forests, and it seems to be quite common in the neighbourhood of Singapore.

## POPULAR AQUARIUM BARBS



One of the large Barb species, *Barbus lateristriga*.

PETER HEWITT concludes his answers to questions on these lively tropicals

**QUESTION** If one decided to breed larger Barbs what species would you suggest to begin with?

**A.** The two species which offer the most chance of success are the Clown Barb (*Barbus punctatus*) and the Spawner Barb (*Barbus lateristriga*). They are both fairly easy to obtain and, provided a tank of at least 18 x 15 x 15 in. is available, the same breeding procedure as laid down for the smaller members of the Genus is quite adequate.

The main difficulty which will be experienced is that they are extremely hard to keep in good condition, being very voracious. However, if fed on a diet having a large proportion of chopped Earthworms, this should be helpful. Once the fish have attained full condition, the breeding process will automatically follow.

### Special Requirements

**Q.** Have you any particular recommendations for keeping and breeding Tiger Barbs?

**A.** Tiger Barbs are a little more difficult to keep and breed than the other small Barbs. It is essential that they are kept in clean conditions, being rather subject to Fin-rot and other bacterial diseases of a mild nature.

For breeding, a tank is set up, as stated in the last issue, and the parents introduced in the normal way after conditioning. Spawning will take place during the next 48 hours. It is quite easy to tell when the egg-laying is completed as before it the two fishes will be found

either together or chasing but, after the eggs are laid, they will tend to keep to opposite ends of the aquarium.

As soon as the eggs have been laid the parents are removed and ten drops of methylene blue are added to the tank, and the whole aquaria is completely blacked out. This will help to prevent the eggs becoming infected.

The fry will become free-swimming after 48-60 hours and feeding can then begin as described for the cistern Barbs. The black-out can slowly be removed during the first week. I find that the best results are obtained by removing the front, sides and top in that order at intervals of two days.

Since their requirements in the way of oxygen are greater than for many other species, gentle aeration is quite helpful, especially if a fairly large spawning is achieved.

**Q.** *Schuberti Barbs* have been noticed in aquarium shops. They seem to be the brightest yellow of any tropical fish. Are they easy to breed?

**A.** *Schuberti Barbs* are quite easy to breed by the same method as the other small Barbs. It is often a good policy with this fish to use two young males with a somewhat larger and older female as, with a single male, broods tend to be on the small side.

**Q.** Are there any published standards to guide me in choosing Barbs for show and breeding?

(Continued next page.)

**A.** The Federation of British Aquatic Societies has published show guides to *Barbus conchatus*, *B. cumingii*, *B. nigrofasciatus*, *B. oligolepis*, *B. parvipinnatus*, *B. postozonus*, *B. gelius*, *B. phutunio*, *B. saphore*, *B. saphoroides*, *B. terio*, *B. tetrazona*, *B. ticto*, *B. titteya* and *B. vittatus*.

For the remainder of the species, since they are such popular inmates of our aquaria, first-class photographs and descriptions are available in the larger aquarium books and will serve as an appropriate guide to potential exhibitors.

### Cherry Barbs

**Q.** *Cherry Barbs* (*Barbus titteya*) seem particularly lovely. Are they more sensitive and more difficult to breed than most other species?

**A.** *Cherry Barbs* are rather more sensitive than most other species and, although reasonably easy to breed, require a little more attention than some others. Basically, the breeding system is the same, except that it is advisable to cover the bottom of the tank with some round pebbles or marbles, as many eggs fail to adhere to the spawning medium. Temperature should be about 80 deg. F.

and the breeding tank should be in a very subdued light. The parents are avid egg eaters, and it is most important to remove them as soon as possible after spawning is completed.

**Q.** Where is the natural home of Barbs? Are they widely distributed?

**A.** The tropical Barbs are mainly Asian fish, being widely distributed over India, Ceylon, Malayan peninsula and parts of Thailand. It is one of the largest group of fishes, containing over 300 different species, but only a few are suitable for aquarium life.

**Q.** What is the life span of the Common Barbs?

**A.** The Barbs as a Genus are long lived and most species will attain an age of four to six years before showing obvious signs of age. Even when quite old they do not seem to lose the vitality which makes them such popular fish.

This age limit can be extended quite considerably if the fish are kept at the lower temperatures (63-68 deg. F.) for a large proportion of the year. In their natural state, most of them experience quite a wide variation in temperature, and a steady high temperature seems to have an adverse effect on their life span.

## From My Experience...

WHEN setting up an aquarium it is my custom to place a little powdered cow manure beneath the bottom compost, the manure having been kept for at least a year before being used. The plants that I grow are mainly *Cryptocoryne* species, whose initial growth and good coloration are often commented upon. I am of the opinion that the basic reason why the plants thrive so well is that the cow manure remains fully effective until the natural accumulation of muck within the tank can take over the feeding. I am aware that London aquarists, like myself, may have difficulty in obtaining this manure, but in my case I had a kind lady aquarist friend, who brought back, from a farm holiday, a large jar of the desired medium and, on handing over the treasure, remarked feelingly—"The things I do for fishkeeping!"

### Jumping Catfish

Just recently a rather unusual incident of an interesting nature occurred in one of my living-

room-cum-fishroom tanks. The fish concerned was a 2 in. long *Corydoras aeneus*. The event took place whilst a friend and I were deep in conversation about fishes, when suddenly we became aware of frantic splashing sounds coming from an aquarium.

On investigation we found that the Catfish had in some way edged its body across the worm-feeding ring, so that only its tail remained in contact with the water; the more the fish moved its caudal fin, the faster the unfixed feeding ring was propelled around the tank. The fish was quickly removed and, on regaining its natural environment (the tank bottom), showed no sign of distress.

Needless to say, the feeding ring no longer remains in the tank. Since this experience I have kept a close watch on my various Catfish as they shoot up for air and it does appear that *C. aeneus* projects a larger proportion of its head above the water line than do other Catfish species.

R. W. ANDREWS

Marine Aquarium Keeping



Douglas P. Wilson F.R.P.S. photograph of a Hermit Crab (*Eupagurus hermanni*) in a shell which shies in an *Anemonia*, *Calliactis* parasitic.

## Amusing Hermit Crabs

Moving home can be a serious business for these crustaceans

AMONG aquarium crustaceans the Hermit or Soldier Crabs are perhaps the most interesting and amusing. Unlike other crustaceans the abdomen or rear end of the animal is membranous and is not protected with an armoured covering, consequently the creatures have to guard themselves from attack by using other means. They have solved this problem by utilising the shells of univalve molluscs such as whelks as a protection for their tender nether extremity.

At different ages the varying species of Hermit Crabs employ diverse types of shells, but the Common Hermit Crab (*Eupagurus hermanni*) invariably is found in a whelk shell when adult, although when young it will use those of toots or periwinkles.

Hermit Crabs are not really closely related to true crabs and their nearest relatives on our coast are the Squat Lobsters which they resemble in their crawling habits but, owing to the fact that their "tails" are confined in borrowed shells, they are unable to dart back when in danger, so instead they retreat rapidly into their shell and close up the opening as much as possible with their right claw, which in these animals is always larger than the other. The last pair of legs are adapted for clinging to the inside of the shell and four legs are used for walking purposes.

Hermit Crabs never voluntarily leave their shells unless it is for the purpose of changing into a larger or, from the Hermit Crab's point of view, more desirable shell. I. E.

Taylor says "Nothing on earth exceeds the shamefacedness of a Hermit Crab deprived of its shell... not even a bather whose clothes have been stolen."

If a Hermit Crab is unfortunate enough to lose its shell it will soon die even if it is not attacked by other animals. Although changing into a new shell is a serious business for *Eupagurus* it is a very amusing performance from the observer's point of view. First the Hermit will find what it considers a suitable shell, and will examine it scrupulously both inside and out; it will turn the shell this way and that, and as often as not will reject it.

### Making Preparations

When the creature is at last satisfied it drags the shell as close to the present one as it can and will then look in all directions in a very suspicious manner. If satisfied that no danger threatens it grabs the lip of the new shell with one of its claws and very quickly withdraws its soft abdomen from the old shell, turns round and pops it in the new shell. For some minutes it remains near its old home in case it discovers something wrong with the new one which it still explores with his legs as though measuring it. Two or three times it will withdraw suddenly into the shell as if to make sure that it can hide completely if necessary. This action, by expelling some of the contained water, also washes out any debris that might be in the shell. When the Hermit is thoroughly satisfied that all is well it will leave its old shell.

If several Hermit Crabs are kept in one aquarium, shells vacated by some of the population may be poisoned upon by others.

There are two species of Hermit Crab that are common on our coast; the Common Hermit (*Eupagurus hermanni*) and the so-called Purple Hermit (*Eupagurus polianus*), which is a smaller animal. The former "crab"

is common everywhere but the latter is found only on the South and West coasts. There is a rare, very small species, the Woolly Hermit (*Eupagurus caudatus*), that is not likely to be found near the shore.

Hermit Crabs, and in particular those dredged from deeper waters, might be described as ambulating zoos, for they often carry both within and without their shells, an astonishingly varied animal population consisting of some or all of the following: barnacles, scale worms, sponges, hydroids, serpulids, small porcellan crabs, anemones, saddleysters and bristle worms!

The large, handsome sea anemone, *Calliactis parasitica*, though found elsewhere, is frequently discovered on the shell of the Common Hermit Crab. Sometimes they carry more than one. This association is thought to be mutually beneficial, for many carnivorous animals wisely avoid an anemone and consequently the crab gets protection in exchange for which he carries the anemone to new feeding grounds.

Often in illustrations of this quaint association the anemone is pictured in an upright position, but in point of fact it is usually bent in an arc so that its tentacles sweep the ground and gather up such edible material as it can find. Since the crabs are rather wasteful feeders the anemone often picks up the crab's leavings.

*Eupagurus prideauxi* carries its own species of anemone, *Adamsia palliata*, and the habits of this pair differ from those of the Common Hermit and the Parasitic Anemone. *Adamsia palliata* is rarely, if ever, found other than in association with its Hermit. It adheres under the shell and its disc, instead of being circular, is wrapped round the shell and eventually meets and fuses together just behind the crab's head. When this occurs the anemone is fixed for life. The anemone grows as the crab grows so the hermit does not have to seek a larger shell when it increases in size for it is adequately protected by the anemone. This habit of *Adamsia palliata* gives it its English name of Cloak Anemone.

In captivity, at least, the Cloak Anemone can lead an independent life. I had a small Hermit, complete with anemone for some weeks, when the crab died. The anemone remained on the shell for a few days and then left it for a stone. Its disc has since taken on a conventional shape and it has lived for over six months behaving like any other anemone. It has, of course, been fed at regular intervals.

Hermit Crabs, given the chance, have no compunction about robbing their attendant anemones of any choice morsels they may have secured. It is stated by more patient observers than myself that *Calliactis* has a penetrating

and nauseating odour. I have never noticed this myself but possibly it is offensive to some of the predators of the sea and acts as an additional protection to the Hermit Crab.

Inside the shell of many but not all Common Hermit Crabs may be found one or more specimens of the ragworm, *Nereis jurcata*. This guest is not so welcome for apparently it sometimes causes the crab some trouble. The worm puts his head out at feeding time and helps itself to pieces of the Hermit's meal. Not only does it get its food provided, but the shell protects it from enemies. The only doubtful advantage that the crab gets is that the movements of the worm help to circulate the water within the shell. When the Hermit decides to change its shell the worm will move with it if given the chance.

#### Anemones Follow the Crabs

When Hermits encumbered by parasitic anemones have changed to clean new whelk shells in my tank often the anemones are found on the new shell within two days and are carried around as before. I have never seen this transfer and do not know whether it is done with the crab's approval but, in the case of the Cloak Anemone and *Eupagurus prideauxi*, L. R. Brightwell has observed the crab transfer the anemone to its new shell after leaving one that proved unsatisfactory. This patient observer of Hermits has, after much work, persuaded Hermit Crabs to adopt glass replicas of whelk shells as homes.

Provided the tank is clean and well aerated Hermit Crabs do fairly well. In my own limited experience I have found *Eupagurus bernhardus* the hardier of the two available species. Hermits, like certain of their relatives, feed in two ways. They take solid food such as mussel and similar material, and they also filter small organic materials from the water, so they do better in a marine tank that is well established.

I always put newly-hatched Brine Shrimps in the tank with Hermit Crabs, and I believe that a proportion of them are consumed by the crabs during this filter feeding.

Empty shells should always be available for the crabs to use should they so wish. Care must be taken to see that the shells are in fact empty and clean. If the aquarist is fancifully minded he can offer the crabs a variety of exotic shells some of which may be accepted.

Should Hermit Crabs show signs of leaving their shells without entering others it is a sure sign that all is not well with them. Increased aeration may be of benefit, but I personally have never known a Hermit which voluntarily remained out of its shell for more than a minute or so to recover its health.



The Editor does not necessarily share the view of correspondents.

#### White Worms and Plants

Sir,—I notice that in a reply to an enquirer you state that Scats are scavengers and will eat dried food. I bought three last Christmas when they were about the size of my thumbnail and two (I gave one away as it was bulged so much) are now about 3 in. long and much heavier in build than Angel Fish.

They will not look at anything, however, except Water Worts and certain water plants (a large lot of them). My worm culture has not been able to keep up with them and for several weeks they have been fed solely on greenstuff, although I have tried them with dried *Daphnia* and prepared dried food and dried shrimp.

They eat more White Worms in a day than another tank of 20 fish including Siamese Fighters and Angel Fish. They are in an aquarium of completely fresh water. I have never added any salt, and they seem quite healthy.

A. STEEL.

Individual fishes vary quite considerably in their likes and dislikes, and general guidelines has sometimes to be modified in the light of experience. Mr. Steel appears to be fortunate in having Scats that thrive in entirely fresh water but unlikely in that they are so selective in their food requirements.—Ed.

#### Daphnia Wanted

Sir,—For the past three years I have been using *Daphnia hyalina* and *D. pulex* together with other species of lake *Gloabera* and *Kopepoda*.

I am now turning my attention to those species found in ponds, etc., such as *Daphnia pulex* and *D. magna*, and I would like to obtain material from as wide an area as possible. As I have kept several fish for a number of years (as an amateur) I know that a great many readers of FISHKEEPING and WATER LIFE go out "Daphnia hunting" and I would like to enlist their help.

I am well aware that the best *Daphnia* season is over, but I am anxious to obtain a few samples in the Winter and any assistance readers can give will be warmly welcomed.

University of Manchester, M. PUGH THOMAS, Manchester, 13.

#### Golden Orfe

Sir,—I should like to add my personal experience with Golden Orfe to the information given on page 224 in October. I have several Golden Orfe which have been in my possession since they were 2 1/2 in. long. In two years they have doubled their size and length. One, which I bought three years ago when 3 in. long, is now a handsome fish of 8 1/2 in. My pond is of 450 gallons capacity, and I am now extending it to 800 gallons. The average depth is 2 ft. 3 in. and the total area will be 60 sq. ft.

From my experience the way to make Orfe grow is simply to provide plenty of room and plenty of live food. As many worms as can be found should be included in the diet, supplemented by house-flies, meat-flies, mosquitoes, etc. In fact Orfe will eat almost any live food. But, in my opinion, there is no food to beat garden worms for any fresh water fish.

Perhaps I have been lucky, but I must say that, in my experience, I cannot agree that Orfe are difficult fish to keep. They are certainly more temperamental than Goldfish, but some of mine will even take worms from my hand and I have lost only one in four years—that from an isolated case of Gill-Flukes.

I would say also that the extent to which fishes thrive depends on the care, attention and regular feeding which it gives them. If your enquirer gives his Orfe regular feeds with worms he will soon see them grow, particularly in the Summer.

Swindon, Wilt.

R. SHERRINS.

#### Visit the Aquarium Exhibition at Olympia

ONCE again support for the furnished aquaria class at the National Exhibition of Cage Birds and Aquaria (from by CECIL BATES and FISHERIES) is exceptionally strong.

There are over two dozen entries for the club tropical aquarium class, 13 for the interclub cold-water (where a new trophy will be competed for) and the considerably increased total of 17 in the individual furnished aquaria. In addition, the section for home-bred fishes is well patronized, at the competition for miniature gardens.

This is the main event for aquarists during the Winter season and a visit will prove enjoyable and instructive. The Goldfish Society of Gt. Britain, the Federation of British Aquatic Societies, the Federation of Guppy Breeders' Societies and the British Herpetological Society will stage special displays in the Aquarium Section.

Visitors will also be able to see the best cage birds (canaries, budgerigars, foreign and British birds) available in Britain in classes which have attracted thousands of entries.

Make your visit to Olympia a family outing—there will be something of interest to everyone. Times of opening and admission charges are: Thursday, January 9 (2.30 p.m.-9 p.m.), 3/- up to 5 p.m., 3/- thereafter; Friday, January 10, 10 a.m.-9 p.m. and Saturday, January 11 (10 a.m.-8 p.m. up to 5 p.m. and 3/- thereafter on both days. Children's half-price. Venue is the National Hall, Olympia, London, W.14.

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

#### What Wantages?

Could you tell me what size heaters would be required for an aquarium measuring 36 x 12 x 12 in. and another of 48 x 12 x 12 in. dimensions so that a water temperature of 75 deg.F. is maintained?—(A.S., Enfield, Middx.).

For a 36 x 12 x 12 in. tank the most economical method would be to use two 75-watt heaters. This will ensure an even distribution of heat over the whole length of the tank. For the 48 x 12 x 12 in. tank two 100-watt heaters could be similarly used.

#### Blue Acaras

I should like to have some information, please, on breeding Blue Acaras.—(M.W.J., N. Harrow, Middx.).

Blue Acaras are relatively easy to breed, and we suggest that a 24 x 12 x 12 in. tank is set up with tap water which has been allowed to stand for about eight days. About 2 in. of compost should cover the bottom, and a flower pot laid on its side in one corner of the tank. The temperature should be about 80 deg.F. The parents can then be introduced and fed on a meaty diet, preferably Earthworms. In a few days they will commence cleaning the flower pot and the eggs will be laid.

There is no need to remove the parents as both will help to guard the eggs and, in about a week, the young will be seen swimming in a small shoal. They can be fed on newly-hatched Brine Shrimps and then screened *Daphnia*, Dwarf White Worms and other livefoods as they become progressively larger.

The parents can be left with the youngsters for four to six weeks. It is not usually advisable to breed these fish until they are about eight to ten months old.

#### More Details on Salamanders

I was most interested in the article on Salamanders in your November issue. I have a spare 24 x 12 x 12 in. aquarium which I should like to convert into a vivarium. The room in which it is situated rarely reaches 40 deg.F. in Winter. Would heat be necessary to keep the Salamanders successfully through the Winter? Could I also have the names of some suitable plants to be used in it?—(A.H., Galashiels, Scotland).

The aquarium you have in mind should be quite suitable for keeping European Salamanders. The tank should be set out and planted as directed in the article. The plants you could use include wild moss growing on stone or bark, and small wild ferns (male fern, hart-tongue and lady fern). Also, the following may be obtained from a nurseryman: any bog primula, ivy, aspid in pots, variegated nettle and a bulb plant or two (*Scilla*, *Crocus*, *Snowdrop*).



The temperature in your room will be quite suitable and we do not advise artificial heating for the tank. Salamanders are very hardy and, if well fed in the summer, come through the Winter with hardly eating any food. In Nature they would hide under stones to hibernate. Artificial lighting is not recommended since Salamanders prefer dark places. You could, of course, fit up a bulb over the tank merely for use when examining the tank, or showing the animals. With reasonable care you should be able to keep these attractive creatures for many years, even breeding from them.

#### Temperature Gradient

I have recently set up a 36 x 15 x 15 in. tropical tank and fitted a light canopy with two 40-watt pearl lamps. The aquarium is situated farthest away from the windows in a north-facing room. The lights have been on for 12 hours per day, but after they have been operating for about three hours there is a temperature gradient from 70-72 deg.F. for the bottom layers of water to 80-82 deg.F. for the top layers.

The top fish in the aquarium show no discomfort except *Zebrafish* and Dwarf Gouramis which tend to stay near the surface. The whole tank has a temperature of 75 deg.F. at night.—(S.J.S., New Malden, Surrey).

There is nothing unusual about a 10 deg.F. temperature gradient in a tank maintained in the manner described by you. Obviously the lamps are mainly responsible for heating the top layers of the water. In static, natural waters even greater temperature gradients develop as the top layers of the water are heated by the sun. We do not think that the health of your fish will be adversely affected by these conditions. If, however, you want to get rid of this temperature gradient, we could recommend the use of an aerator or filter.

#### Water Analysis

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

#### Midlands Miscellany by W. L. Mandeville

THE City of Birmingham, usually associated with heavy industries, hard-tackling footballers and hard-headed business men, has a keen eye for loveliness. The Parks Department makes use of flowers and shrubs on every available verge and traffic island and invariably includes decorative water in its public displays.

The permanent fountain in Chamberlain Square—a favourite rendezvous for wedding photographs—uses a rare variety of water, plumbing and cascading over itself with ever-changing patterns. It has been likened to a burst water main, but at least it has the advantage of being wind-resistant, and can be watched without wearing waders and sou-westers, so often necessary with spray fountains.

This fountain would house fishes were it not for the occasional introduction of detergents and aniline dyes by practical jokers.

Erected by the Water Department as a constant reminder of the foresight which brought Water to Birmingham, the fountain adjacent to the Hall of Memories seems to be treated with greater respect. Here, a series of jets around the periphery of the lower basin, throw streams of water upwards and inwards into a bowl, whence it flows through outlets back to the original basin.

The movement and glint of the water is emphasized at night by lighting effects. The general principles of this fountain would be an ideal for a garden fountain if reproduced in miniature.

#### Basic Aeration

In its advice to judges of decorative aquaria, the Midland Association of Aquarist Societies suggests that all contrivances and equipment be as inconspicuous as possible. There would appear to be steps in this. From a local dealer comes an authentic report of customer dissatisfaction. This customer, having purchased recently one of those bubble stones, had returned it declaring it to be useless.

Diffuser stones are not an expensive item and an exchange was made without quibble. The customer then asked for the new stone to be dropped into a tank of water, and almost before it reached the bottom declared, "There you are—just a single bubble from it". The air line, aerator, and transparent diffuser stem had to be brought to his notice!

#### Business Meetings

Annual general meetings will be held by many societies during the coming weeks and, whilst the rules of some clubs insist on a complete change of officers annually, generally speaking something more permanent is preferable if continuity is to be

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

preserved, otherwise there comes a moment in every A.G.M. when the society is devoid of officers, and the age-old search begins for someone with sense enough to do the job, and crazy enough to take it on!

Chairmen and treasurers certainly have their uses, but, by and large, continuity is best maintained in the office of secretary. Few societies can equal Belle Vue's record of two secretaries in 21 years, but the Molland Aquarium & Pool Society runs it close with three in 23 years—Mr. T. L. Dodds, with one of the best known postal addresses in the Midlands, having carried the torch for most of that time.

#### Stalwart of Leicester

At Leicester, Mrs. W. Gascoine is another faithful servant; she cheerfully asserts that she will carry on until the Leicester Aquarist Society finds someone else, but it is very doubtful if Leicester is looking very hard.

Having overcome the difficulty of replacing officers and committees, many societies are faced with the problem of membership renewals and subscriptions. Not so at Walsall, where membership is continuous from date of joining, and provides a constant flow of renewals throughout the year avoiding that unpleasant state of affairs when a new committee takes over and finds that the treasury is still the Black-Countymans so graphically describes as "skin".—W. L. Mandeville, 327 Queens Road, Gt. Barr, Birmingham.



Fountain near the Hall of Memories in Birmingham.

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

In a recent newsletter, the committee of the Merseyside Aquarist Society asked for information about the origin of their society so that they could celebrate their anniversary when it became due. This raises a question about societies' histories and how continuous they are. So far as I recall, Merseyside aquarists formed the present society immediately after the war, in 1945, mainly through the efforts of Mr. and Mrs. J. Plant, Mr. Frank Williams and the late Mr. N. Alderson, all of Liverpool.

Although some of Mr. Williams, were veterans of the pre-war Merseyside Aquarium Society, I do not think it could be called a continuation of the old society which met in Wallasey and died out completely before the war.

**Keeping a Record**

Some sort of permanent record should be kept by societies of the essentials of their past history. Often, like this, few original members are left after the first decade, secretaries change rapidly, and sometimes there are splits, and break-away societies are formed. Minute books are tediously long-winded, difficult to read years later, as they contain a variable assortment of hand-writings, and a lot of material is of merely temporary interest.

How, then, do societies keep their records for posterity? Here are some ways I have noticed. One society sent the reports of its monthly meetings to the little country weekly newspaper of its town, and arranged for the printers to run off a number of galley proofs after they set it up in type. At the end of the year these were bound together in a printed cover and sent to members as an annual report, with a copy presented to the local town library.

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

THE last week in November was chosen by the Bristol & Bath Section of the Guppy Federation for their social. This was the second of these events, which provide something for everyone. The meeting opened with a most interesting chat from Bill Howe (London S.E.3), who was making his first visit to the Section.

The tea interval provided an opportunity for an exchange of views between the hosts, Bill Howe and visitors from South Wales and Gloucester & Cheltenham Sections.

The table show resulted in the award of two silver pins, one to Mrs. Steer for Bottomwood Males and the second to Roy Bryant for Doublewood Males. An Anniversary Cup, presented by Rodney Vince for the best section team, was won by Gloucester & Cheltenham. The remainder of the evening was occupied in a series of games organized by Gordon Beching.

A new venture has been initiated at a meeting held recently in Bristol. This is a Tropical Study Group. The group has an ambitious programme which includes training judges and providing

Another method is to mimeograph a monthly or annual footscape report, which folds down the centre to pamphlet size. Many typing firms will do this for two or three pounds, or less, until the club can find a typist to do it for them.

Another method is the portfolio—an album circulated amongst members who contribute to it photographic prints, newspaper cuttings, accounts, drawings and paintings, and any articles or experiences they wish to add.

The latter can become extremely interesting. For example, I have deposited in the local library or its contents reviewed annually, I know of one portfolio illustrated by beautiful water-colour drawings of fishes, another with snapshots of outings, a third with pictures of officials.

Another had lots of localities where the various coldwater tanks and garden lily-pools; where *Daphnia* could be most easily collected and where the more interesting fishes and water life could be found for school aquaria.

I recall how the pre-war Weyra Litt discovered a very widespread interest from teachers and schools in the old-fashioned coldwater aquarium of our native water life.

This still exists, and "life in ponds and streams", as it used to be called, could form a healthy group within any fishkeeping club. Finally, the portfolio can have a book-list, and a review of new books.

**Fishkeeping Encouraged**

When Wallace Corporation combined recently with the New Brighton Pier and Sea Angling Club for its first sea-angling festival one of the prizes was a plastic fish tank to encourage fish-keeping as well as fish catching. "Aquatius", 47 Woodsters Road, Liverpool, 15.

speakers or quiz panels for local meetings. The Group includes members from all the local clubs and will, I am sure, prove a strong, cohesive force.

The chairman is Victor Jones of the Bristol Zoo and the secretary is J. Wheeler 53 Comely Green, Twerton, Bath. The formation of the Group means that, with the Bristol Coldwater Fish Breeders' Group, advanced aquarists are well catered for in the Bristol area.

Dick Somers, who is well known to members of the Stratham Club in south-west London, has been elected chairman of the Bristol Tropical Fish Club.

**Returns to Action**

Attending the December meeting of the Bristol A.S. was a pleasure to meet Wilfred Hans, who received many congratulations on his recovery from an illness which prevented his helping at the club's recent open show. He was greatly missed.—H. C. B. Thomas, 2 Grove Park, Bristol 6.

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

IT was pleasant to see the Edinburgh A.S. coming back to the fore when it recently held a most attractive show in which many members participated in the furnished aquarium class. It is really essential to have such a class well supported if a show is dependent on response from the general public. The inter-club section also had been competition.

The strange thing was that all the competing societies came from the west of Scotland, although on the eastern side of the country, and one would therefore expect a show in Edinburgh to be supported by these clubs.

All the officials and members of the Edinburgh society who helped to make the show a success deserve praise for their effort. It is a great pity that their clubrooms, in which the event was held, are not in a better situation from the crowd-pulling point of view.

The quality of fish shown was very good indeed in all classes. A miniature metal-framed furnished tank, complete with top-light and containing young White Cloud Mountain Minnow, deserves special mention as a novelty exhibit. The tank

measured about 4 in. x 3 in. x 3 in. and its water was well light perfect.

Another very interesting competition held by the Edinburgh society that covering home aquaria. The judges visit the homes of the various entrants and judge the tanks in the surroundings they were made for. This certainly encourages the home fishkeeper.

There is a lot to be said for a society having its own clubrooms and, provided there are enough keen members prepared to give up a considerable amount of time to the running of them, the advantages far outweigh the disadvantages.

Nothing can be more pleasant than the holding of meetings in premises where live fish are kept and, if a society is not in the fortunate position of having a public aquarium for a meeting place, a clubroom is the answer. A lot can be done in an experimental fish breeding and the society can take an active part. This gives some of the less fortunate members, who cannot attempt to breed fish at home for one reason or another, a chance to participate.—K. A. M. Robertson, 32 Edzell Drive, Newton Mearns, Renfrewshire.

**AMONG** fish from Thailand imported by the Troparium, Frankfurt, a few entirely new ones in many respects unusual. Puffer fishes have been found by P. Chlapaty and G. Benti and described by them in the September issue of *DATZ* as *Carinotetraodon chlapatyi*.

The fishes, of which five have so far been found in several imports, are about 2 1/2 in. long and are grey. They are easily distinguished, however, by a brilliant blue tail fin and by their dark dorsal and anal fins.

Though the fishes did not molest other species in a community tank where they were being kept, they were always ready to fight each other in the tank. When another *Carinotetraodon* was introduced, they "puffed up" immediately, though in quite a different way from the more well-known Puffer Fishes.

A dark comb arose on the back of the fish and a similar one from underneath of the mouth to

the anal fin, rather like the keel in a sailing boat. At the same time the usual dark markings of the fish disappeared and it took on a uniform yellowish-grey colour. The colour tone of this species varied greatly among individual specimens, according to light and moods.

Another interesting point about this new fish is the function of its upward pointing mouth, which is rather like that found in surface feeding species. This characteristic rather puzzled Chlapaty, as it caused the fishes to take up all sorts of unusual positions when feeding on *Daphnia* and *Tubifex*, until he had the opportunity of observing one of the fishes attacked and catching a small—rather staple food—which was on an *Echinodorus* leaf. The fish bit through the leaf from underneath and pulled the snail through the hole into its mouth.

**Climbing Salamander**

THE South Californian Tree Salamander (*Ambystoma tigrinum*) is the only one that can climb trees and may be found high up hiding in hollow tree branches.

In the vivarium it will not normally take to climbing, but will be quite happy hiding in the moss or under a piece of bark. This salamander reaches a length of 5.6 in. and is nocturnal, mainly spending the day in hiding. It gets very active at night when it hunts spiders and all kinds of small creatures, including flies and tiny worms.

In good condition it is quite handsome with its polished dark brown, almost black, skin which carries numerous white and yellow pin-points. Its requirements in the vivarium are simple; temperatures between 64 and 68 deg. F. are humid, though not too wet, and damp. Little is known about its breeding, though the female is said to guard the eggs. This information was in the *DATZ* issue for September.

**Plants and Animals of Pond and Stream**

THIS book, which has been translated from the Dutch and adapted for Great Britain by Mona C. Harrison, provides a handy and accurate guide to most of the plants and animals which are likely to be found in or near freshwater.

There are illustrations of 500 species of plants, invertebrate animals, fish, birds and mammals and concise descriptions of each with corresponding numbers so that quick reference can be made to confirm an identification.

Inevitably there are many Continental species described that do not occur in Britain, but these are clearly indicated and, to readers of *FISHKEEPING* this will probably be an advantage for some of the creatures, such as the Green Tree Frog, Alpine Newt and Yellow-bellied Toad, are commonly kept in vivaria.

The illustrations, both in colour and black-and-white, are, in the main, good. There is an index to species, a glossary of difficult terms and a comprehensive list of books in English for further reference. This is a book that can be strongly recommended to all who enjoy exploring ponds and streams and their margins.—J.C.

\*By W. J. Prof'Homme van Reine. Illustrated in black-and-white and colour. John Murray, 12s.

**Cephalopods from their fossil ancestors** down to the development from the egg to the adult in modern types. It covers their behaviour, breeding habits (and strange, indeed, they are), intelligence, economic importance, and even goes into details of how to cook and serve these succulent morsels!

In many ways Cephalopods are much maligned creatures. Simple in their way, for they are only molluscs, they have achieved remarkable success in the battle with the world for the right of existence. They have adapted themselves to a wide range of conditions; have an ancient lineage and range in size from less than an inch to 60 feet overall. In the favour it can be said that they make good mothers.

Frank Lane has filled a long-standing gap in the literature of water life, and he has filled it well. If another 80 years pass before a successor to this book is written, readers will not have been badly served.

While the title of the book indicates its scope, there is much about such obscure animals as *Spirula* and the Nautilus. Though thoroughly scientific in its approach, this book is written in so engaging a manner that one reads it as easily as one does a light novel.

There are over 50 superb plates (many in colour) and numerous diagrams. For the serious student there is a bibliography of 21 closely printed pages. This book is true natural history in its most palatable form, and should make a most acceptable present for the aquarist whose interests range further than the confines of his own rectangular aquarium tanks.—J. S. V.

\*By Frank W. Lane. 287 pages, 52 plates and 13 diagrams. Jarrold Ltd. 9s.

**Living Reptiles of the World\***

HERE is a descriptive work on an important major group of modern animals—the reptiles. Lavishly illustrated, like other works in the series, it pioneers a new venture in natural history literature. The superb photography, especially the colour plates, make this book a joy to possess, as well as an excellent reference, since colour photography is undoubtedly the most effective medium of nature recording.

In speaking of reptiles the co-authors rightly describe them as "the great central stock, ancestral to both mammals and birds and themselves derived from the amphibia", some knowledge of which "is important to everyone who wishes to understand something of man's place in nature."

"Living Reptiles of the World" parades this much misunderstood collection of animals in all its fascinating diversity of shape and colour, and records their story in words, coming from two eminent herpetologists, which are ably criticised. Here is an ideal possession for the amateur as well as professional, young or old, and for those who like reptiles as well as those who do not but might be encouraged to do so.

It is sad to record the passing of the senior author, Karl Patterson Schmidt, who died in his beloved in the Chicago Natural History Museum last September.—A.L.

\*By Karl P. Schmidt and Robert F. Inger. 246 illustrations, 145 in colour. Hamish Hamilton, Ltd. 45/6.

**Cuppy Federation's A.G.M.**

IN the month for annual general meetings, that of the Federation of Guppy Breeders' Societies comes up this month. The general secretary and the vice-president are one to retire. The show secretary and show organizer and the overseas secretary have tendered their resignations and these posts also have to be filled.

Mr. A. J. Heston, the retiring general secretary who has served the F.G.B.S. well over a lengthy period, will, on medical advice, not offer himself for re-election.

The annual social evening of Eastern Counties Section was a most enjoyable occasion despite inclement weather. South London, Basingstoke and North London Sections were represented. A provincial member from the Midlands also attended. The table show held during the evening between 4 London and 4 Counties in the S.L.S./E.C.S. District competition resulted in 4 winners.

**F.B.A.S. Emblem**

FOLLOWING requests from affiliated societies, the Federation of British Aquarist Societies now has available and ready to order a new design for the F.B.A.S. emblem in their design. A complete set of Fishing Fish motifs is shown on a many blue background and consists of 400 (trypone) and 276 (trypone). Further details can be had from Mr. R. O. B. Lee, 14 Crosswell Court, Willesden Lane, London, N.W.6.

A number of changes occurred at the Federation's A.G.M. held just before Christmas. The general secretary and the engagement secretary were due to retire and were not available for re-election, whilst the post of treasurer was vacant.

Mr. C. W. G. Creed was retiring as vice-chairman but was available for re-election and several of the five retiring Council members were also willing to stand again.

Mr. C. W. G. Creed and Mr. R. Skipper gave an interesting report on the last World Federation Congress at the conclusion of the A.G.M.

**Tooth-carps Win for Slough**

SLOUGH WEST Midlands Aquarist Association held a 90-table show on November 8 when Mr. H. Kidy's *Aplocheilichthys* took the Diploma for best "bounty" team. Mr. H. Kidy thus helped his club—though A.S.—to win the Society Shield with 19 points. The show was second with 10 points.

Mr. H. G. Randle, of Slough, who first in the Mottler

**Correction**

IN the *Windmill* Proclamation advertisement on the inside back cover of the last issue, the price of the Premier Biological Aquarium Filter for 24 in. tanks was incorrectly given. This should have been 12/- and we apologise for any inconvenience caused.

**North-West London Group**

THE November 26 show of the North-West London Group of Aquarist Societies resulted in success for Independent A.S., with 10 points to runner-up Hendon's 9. Tying for third place with 7 points were Willesden and Arnold societies.



At the world premiere of *Barnaby Rudge* at the Empire, Leicester Square, London, in December 11, film actress Joan Herbert inspects one of the aquariums set up in the cinema by Mr. A. Ross of Queensborough Fishery.



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