

# The AQUARIST AND PONDKEEPER

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## Editorial

WHERE are the present-day fish connoisseurs? This question is asked by Dr Myron Gordon in his article on the purple platy in this issue. It raises, incidentally, a matter that can easily be overlooked—that of our dependence upon the decisions of the commercial fish breeders and importers about what species shall be made available to aquarists. In general we can consider ourselves to be well served by them, for the list of species commonly available is a long one. But what of fishes not imported because the market for them is judged to be much smaller than for the tried and popular species? It does seem that there are fewer collectors of the rare and unusual, the "fish connoisseurs" in Dr. Gordon's question, than there were 20 years ago despite the great increase in the total number of aquarists in the world. But merely because the demand is likely to be small is not really a good reason for the importer not to handle less common species. It would be a sad day for society if only the interests of the masses were served by, for example, radio, television and publishing. Importers have obligations to the specialist, even if he is in the minority.

FOR the first 12 years or so after its foundation in 1924 *The Aquarist and Pondkeeper* was the only periodical in Britain devoted exclusively to the interests of aquarists. With the cessation of publication of *Fishkeeping and Water Life* last month we are once again the only aquarium journal in this country. We do not, however, view with any complacency the state of economy in publishing that has forced a number of specialist journals, like our respected contemporary, to disappear from the market. Costs of production for journals have continued to mount in the past decade, and with this, shrinking circulations have been a more recent phenomenon suffered by journals of all types when the reading habits of the population changed. For *The Aquarist*, we hope to continue to demonstrate our faith in the hobby of fish-keeping and to serve it to the best of our ability, as we have tried to do during the past 34 years.

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## The Purple Platy from Mexico's Río Soto la Marina System

by Dr. MYRON GORDON (*Geneticist, New York Aquarium*)

**I**N Mexico along the Pan-American highway, halfway between Linares and Villagran, the road, conforming to the rising tableland, reaches a peak of just over 1,500 feet. These intervening highlands form a natural divide between the watershed of the Río San Fernando to the north and that of the Río Soto la Marina to the south. The northernmost tributaries of the Río Soto la Marina flow south-east from the eastern ridge of the Sierra Madre Mountains to the Gulf of Mexico, emptying into the Gulf about 50 miles north of Tampico. We fished in the Río Pilon and Arroyo Meco but their waters were muddied by heavy rain back in the mountains. From the aquarist's point of view no brilliant new forms appeared, although from the purely scientific viewpoint every fish represented a new item. Not for 50 years has this area been explored for the species natural to the region.

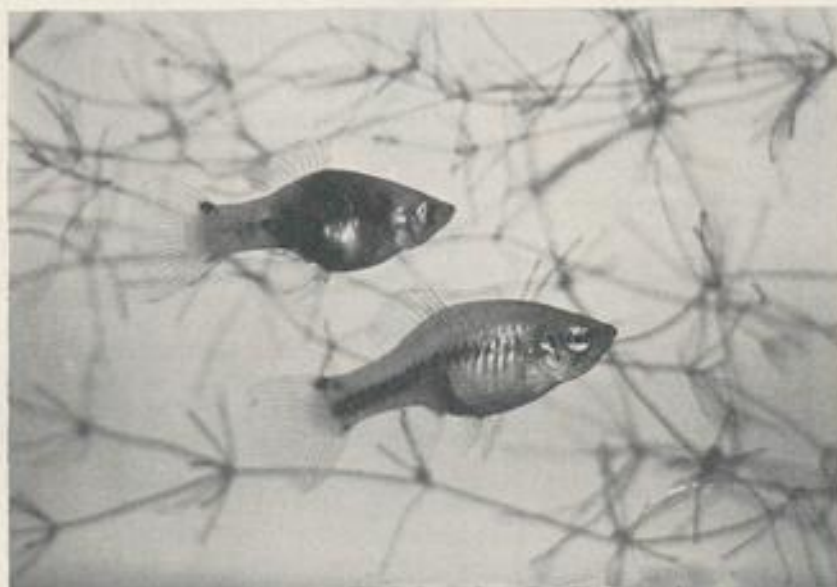
### Stagnant River Pool

South of Hidalgo we reached one of the largest of the Río Soto la Marina's tributaries, a river which has the symbolic name of Río Purificación. At the height of the dry season, when we happened to visit it, parts of the Río of the holy name looked less than inspiring. A narrow ribbon of water trickled in and out of a narrow, tortuous channel within the enormous river bed, over 600 feet wide. Many of its tiny branches were dead ends forming pools between huge boulders. The stones, heated by the sun, speeded the evaporation of the trapped water.

Around a sharp turn, the waters formed a slow swirling

back-eddy of green water. As we approached the murky pond we disturbed a flock of vultures that were resting on the scraggly branches of a dead, leafless mesquite tree that overhung the banks of the river. The tracks of the unlovely birds covered the muddy edges of the stagnant river pool and from their pattern it appeared that the naked-necked scavengers had been feeding upon the dead fishes that bobbed up and floated on the surface or had drifted to the shore. The noon-day heat blanketed the area; the Río Purificación was dying and as foul as a cesspool. With our fishing gear but without our customary enthusiasm we slipped down the slimy banks into the dirty water. We pulled our seine after us, hoping we might get those fishes that had survived the intolerable conditions. No one would have blamed us if we had passed up this filthy job. But then if we had passed it up, how would we have known what was in it? Our map showing Río Purificación would have been a glaring blind spot constantly reminding us of our squeamishness.

In this instance we were rewarded, for we rediscovered a brilliant new platyfish, one that never before had been seen as a live aquarium fish. Only once before had it been taken; that was by Seth E. Meek of the Chicago Natural History Museum back in 1904. The remarkable platyfish from the Río Purificación appeared at first glance to be an intermediate form between the typical platy and the typical swordtail in one detail, because the males had a small, sword-like extension to their tail fins. Otherwise its platyfish attributes were obvious.



The male (upper fish) purple platy (*Xiphophorus xiphidium*) shows a small sword-like extension to the lower edge of its tail fin

It occurred to me that perhaps the new sword-tailed platy might be a natural hybrid; for often many aquarium-bred male hybrids between the common platy and the common swordtail have tiny swords. Yet, after fishing in the Río Purificación and in other tributaries of the Río Soto la Marina for many days, we failed to find any swordtails, nor had anyone else previously reported them this far north.

#### Platy with a Sword

So distinctive was the abbreviated sword of this new platy, and so constant was it in all mature males, that Dr. Carl L. Hubbs and I decided to bestow upon this fish a new specific name: *xiphidium*, meaning "with a sword." Upon further study, later, it proved to be one of the intermediate links between the old genus *Platyposyllus* and *Xiphophorus*. As a consequence, the discovery of the new platyfish was in part responsible for the elimination of *Platyposyllus* as a generic name and for its union with *Xiphophorus*.

Because we found the new platy during the bad season in the life of the Río Purificación we obtained only a few specimens and they were in poor condition. It seemed like a miracle that they had survived in that suffocating eddy of water. Later, near the village of La Cruz, we found a clean run of the great river and it was a pleasure to explore it. We searched about and found a small, clear spring pool oozing out of the western bank. The pool contained a miniature jungle of water weeds and was directly in the bed of the Río Purificación. In between the entangling plant filaments we found several hundred platys, sturdy and shiny like fresh coins from the mint. It is remarkable that the platys in these thickly populated spring pools survive and become re-established in so exposed an area, for during every rainy season the entire river valley is swept over by torrential floods. Often in their violent rush downstream the waters change the contours of the valley by scouring its bed and widening its banks. Yet the platyfish of these spring pools directly within the river bed persist in their weedy niches year after year.

In the early morning hours after we had caught a fine group of new purple platyfish, we placed them in shipping cans and had them travelling northward from La Cruz on the noon train. They arrived at our Laboratory in excellent condition. When they were transferred to aquaria, they bred and provided many young; they turned out to be a hardy aquarium species. Within a few years a shipment of our new spike-tailed platy was made to Europe from the United States. It was gratifying to have been able to send this platy to the Old World aquarists who, in previous years, had sent so many fine species to this country. Scientific papers written by Herr Professor Curt Kosswig, then of Braunschweig, Germany, later of Istanbul, Turkey, and who is now back in Hamburg, described the heredity of this species. We, too, have been working with them and we hope to extend the knowledge of genetics of the *xiphidium* beyond what has already been published about them.

#### Local Races of Platys

In 1939 we discovered another hidden metropolis of the purple platy in a spring pool near Hacienda Santa Engracia, not far from Ciudad Victoria. At that time my wife, Evelyn, and I found a tiny stream that flowed into the great Río Santa Engracia. It contained a few purple platys, so I decided to trace the brook to its source. A quarter of a mile up a gentle slope we found its fountain head in a 6 feet plant-filled spring pool. The purple platys were hiding in an almost solid mass of water weeds and it was hard work getting them out, but we dug and fished out more than 200 platys. From this stock, and the few we

took alive in 1939, we have maintained them to this day by brother-sister inbreeding for 16 years.

The ability of a platyfish population to "stay put" in their chosen natural niche despite yearly droughts and floods may account for the building up (through a process of inbreeding) the distinctive features of local races. For instance, in the northern tributaries of the Río Soto la Marina very few of the purple platys were spotted, certainly not more than 1 per cent.; the populations of the same species further to the south contained many more spotted members, about 60 per cent.; the same platyfish species in the southernmost tributaries were nearly all spotted.

With these statistics in mind, if I were given a single *xiphidium* I could not tell from which tributary of the Río Soto la Marina System it had come. But if I were given about 50 platys, all from the same pool, I could tell with some degree of accuracy where they came from. I could do this by counting the number of spotted members. If they represented only about 1 per cent. they had to come from the Río Purificación; if about 60 per cent. were spotted, then they must have been from the Río Santa Engracia; if nearly all were spotted, they were from the Río San Marcus at Ciudad Victoria.

This points to an interesting fact about how groups of related fishes live in nature. Each community of a species becomes a distinct population that differs from its neighbouring colony not necessarily by having certain unique features but by having a certain frequency of similar traits. In populations of primitive man and civilised people living in isolated groups, anthropologists find a similar state of affairs. This is because local peoples and local fishes are more likely to marry their own close relatives; as a consequence of some degree of inbreeding, local populations take on distinctive traits.

#### A Connoisseur's Fish

The mature male *xiphidium* platy is a strikingly coloured fish. Its remarkable colouring does not depend upon its brilliance of yellows or reds that are characteristic of some of the other species of platyfish but upon its deep purple, which is almost black in its intensity. No other platy has this colour. The purple platy is a natural because its colour is typical of wild fish, that is, it was produced in its native habitat, not in the aquarium. The purple platy is a peaceable fish when kept in good condition, fed on a variety of fresh and prepared fish foods, and when given adequate living space. It is not aggressive towards other species or its young.

Why is the platy that is born to the purple not more available to the public? The purple platy, like many other new species of fishes and varieties of old species, like the wagtail for example, has been distributed freely by the New York Aquarium to commercial breeders of tropical-aquarium fishes so that they would become available to all. The breeders have turned the purple platy down. Why? Because they say that the purple platy does not have the flashy colouring of other platys. They claim that the *xiphidium* would not stand up in public demand and sales against the bright red-and-yellow *variatus* and the many-coloured *maculatus*. For these reasons they do not want to risk their investments in time, labour and hatchery space.

Nobody can blame the commercial fish breeders for refusing to invest in a new fish, no matter how exotic it is, which, in their estimation, will yield them no return. This makes the situation of the tropical-fish hobby to-day quite strange. Some of us may remember not many years back that when a new aquarium fish became available it was eagerly sought for as a collector's item. I wonder, where are the present-day fish connoisseurs?



Photo :

Robert Bustard

Carolina anole or United States "chameleon" (*Anolis carolinensis*), a small active lizard with the ability to change colour from brown to green

## Anolis Lizards—by ROBERT BUSTARD

THE *Anolis* lizards (or anoles) are commonly kept as pets in the United States, where they are known as the U.S. chameleon. Although in no way related to the true chameleons (Chamaeleontidae) they are able to change their colour to a marked degree, rivalling many types of true chameleons. In a matter of a minute they can change from bright green to dull brown.

Anoles are arboreal lizards which are remarkably difficult to see when at rest among foliage, so well do they match their surroundings. If an attempt is made to catch a specimen it darts off, jumping and running among the leaves. Anoles, of which there are about one hundred species, have adhesive pads on the toes which enable them to cling on to leaves, or in captivity to climb the side of the vivarium or even the glass front. The body is covered with granular scales.

### Carolina Anole

The species which is usually kept as a pet on both sides of the Atlantic is the Carolina anole (*Anolis carolinensis*). This lizard is adult when 5 or 6 in. long. It makes a very suitable vivarium inmate provided that the owner can keep up a supply of live flies and bluebottles on which these lizards feed. They will, from time to time, accept gentles and even mealworms, but flies must form the bulk of the diet. In season, moths and butterflies also are relished. Like many arboreal lizards the anoles may not drink from a dish, and it is a good plan to spray the foliage in the vivarium with water once daily. I always place a small water dish in the cage as many specimens will learn to use this, at least occasionally.

The vivarium for these lizards should be fairly roomy,

because although small in size, they are active lizards and I strongly urge that a number are kept—one specimen would have a very dull existence and would not be seen to advantage. Anoles are gregarious lizards, always "fighting", playing and chasing each other. Most of the fights are mock affairs but sometimes rival males attack each other and very occasionally one scores a notable victory in securing the tail of the opponent.

The case for these lizards should be fairly high, to enable growing plants to be kept in it. I recommend a minimum size of 20 in. by 20 in. by 20 in. and if possible slightly larger. Such a vivarium would provide accommodation for two pairs. A 36 in. by 20 in. by 20 in. vivarium on the other hand can comfortably hold up to a dozen specimens.

When these lizards are kept in indoor vivaria it is a good idea to limit the number of males to prevent excessive fighting. One or two males are sufficient. Average price of anoles is 10 shillings each.

### An Incubator for Eggs

These lizards often breed in the vivarium and the eggs (usually two in number but sometimes only one) are easily hatched. They should be placed in an "incubator"—a metal box about 6 in. by 6 in. by 4 in. deep with 2 in. of damp earth placed on the foot; this is then covered with damp (not wet) moss, and the eggs are placed on top and covered by more damp moss.

If the earth at the foot of the container is quite wet (the eggs being separated from it by a thickish layer of moss), and the heat source is below, then water evaporates from the earth layer, passes through the moss containing

the eggs and keep them moist and condenses on the cool lid. In time it drips back through the moss to the earth layer. To permit excess of moisture to escape, small holes are made in the metal lid. I should stress that the amount of moisture in circulation is very limited, but the eggs are always kept in a humid environment. From time to time it may be necessary to pour carefully a few tablespoons of water into the earth layer to make up for loss through evaporation. The temperature can fluctuate somewhat but I usually place the tin on top of one of my metal vivaria where the temperature is at least 75°F. This temperature I maintain day and night during the incubation period.

For the benefit of those who have never tried, or failed, to hatch lizards' eggs I have described my method above in some detail. The idea is to prevent excessive dampness, which causes fungoid growths on the eggs, or excessive dryness, which causes them to shrivel up. Either is, of course, fatal. During the incubation period, which is about 6 weeks at 75°F. for *Amblystoma carolinense*, the eggs increase in size by absorbing moisture. This "incubator" can be used to hatch the eggs of other lizards to be described in later articles.

#### Anoles Outside

The anoles are also ideally suited to the outdoor vivarium, but only if this is fully enclosed, owing to their climbing

abilities. I have a greenhouse-type vivarium which keeps the anoles in and also prevents the bluebottles from escaping. My anole-chameleon greenhouse commonly houses about a hundred specimens of each group and is a constant source of activity in the summer months. Specimens kept out of doors should be brought in to the heated vivarium in the autumn and should not be returned to the outdoor enclosure until the temperature is at least 45°F. at night and all chance of frost has passed. Specimens indoors should be kept at about 75°F. (day), and this can safely fall to 50°F. at night.

Male anoles have an inflatable throat-pouch which they can erect at will. This is red in colour, owing to the blood inside showing through its walls. Like all iguanids they bob their heads at rivals and prospective mates, which usually reply. Males sit and inflate their throat-pouch when showing off to females before mating and also to warn off other males, which may return the challenge. In such cases they usually circle each other like two knights in armour, but in the majority of cases a female appears, or a choice insect lands nearby, and the fight is forgotten.

I spend hours watching my specimens in the garden. These active little lizards are ideal for the indoor or outdoor vivarium and their gregarious habits make them of especial interest.

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## The Mystery of the Zebra Fish

by A. BOARDER

AT a fish exhibition not long ago I was called to see some zebra fish (*Brachydanio rerio*), which, it was said, were all dying soon after they had been introduced into a newly set-up furnished tank. I examined the tank and found it to be the usual 24 in. by 12 in. by 12 in., well set-up with well-worn rockwork and matching compost. Adequate plants were present and the water appeared clear and pure. About 14 zebra fish had been placed in it and these were said to have been in perfect condition when put in. When I saw them they were all at the bottom of the tank instead of actively swimming in a shoal in the top 3 or 4 inches of water. They appeared to be making laboured efforts to swim but were unable to do so. Some were lying on their sides on the bottom and all appeared to be in great distress.

I started the usual detective work. They appeared to have been shocked; had they been placed in water much colder than the carrying can? No, the temperature of the can water was 68° F. and that of the tank 72° F. Certainly nothing there to have upset the fish. Had the rockwork been used before? Yes, several times, with no ill-effects after some days. Was the water from the same source as all the other tanks at the show (in which all the fishes were in perfect condition)? Yes, all water was the same and no feeding had been carried out.

The lady owner of the fish was very upset, and rightly so, as not only would it have been a loss if these fish had died but no others were available to take their place in the competition tank. I puzzled over the problem and suggested that the fish, which had been in a dark can, might have been upset by the bright light over the tank. Accordingly the

lights were switched off and, as if by magic, all the zebras started to swim naturally in a shoal near the surface. Within seconds they appeared none the worse for their previous symptoms.

We had apparently solved the mystery, but as I had never heard of such a happening before I was still very puzzled. Suddenly there was a great commotion; the husband of the lady aquarist had touched the electric lead to the tank and had received a very severe shock; he was slightly burnt on a finger and was thrown to the ground. The lead and tank were then tested and it was found that they were "live."

An electric-kettle flex had been used as a temporary measure and this was very wet and faulty. The concrete floor was also wet and the staging was metal. The faulty flex was removed and replaced with new. The lights were switched on and the fish swam about in grand condition as if nothing had been the matter a few minutes before. These fish had been getting an electric shock, and it is questionable how long they could have survived under such conditions. Under the effects of the shock they seemed to be paralysed, could hardly make any movements at all and could not even remain on an even keel in the water. When the mystery had been solved I could not help but wonder how many other such happenings had caused the deaths of fishes which were unexplained previously.

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## Cacti in the Fish House

ALTHOUGH the plants are resting now a little attention may still be necessary. Some plants may collect dust from the atmosphere and this can not only spoil the look of a plant but can interfere with its breathing. Dust may be blown from a plant but where there are many spines this may not be enough to clear it away. It is then necessary to spray the plant with warm water. This can be done out of doors on a bright mild day. To prevent too much water from reaching the soil some paper can be placed over the top of it and be removed as soon as spraying has finished.

# EXOTIC WATER PLANTS AND AQUARIUM DECOR

by DUNCAN SCULTHORPE

(Photographs by the author)

SO far in this series of three articles, the general principles of aquarium lay-out and some of the plants useful for underwater decoration have been described. I have mentioned that all classifications of plants are unsatisfactory from some point of view, but showed that the most satisfactory from the aquarium-plant grower's needs is to divide aquatic plants into:

- (a) those grown from cuttings, rooting adventitiously from lower stem nodes;
- (b) those grown as individual plants rooting from a prominent crown, bulb or rhizome;
- (c) those grown as floating plants.

In the second article, the commoner aquarium plants were discussed, followed by descriptions of some rarer plants which may be grown as cuttings. In this third and last article, I shall discuss individual rooted plants and those species with a floating habit. Those rooted plants grown singly or in small groups may be divided for convenience into the larger specimens and those grown as dwarf plants.

## Large Water Plants

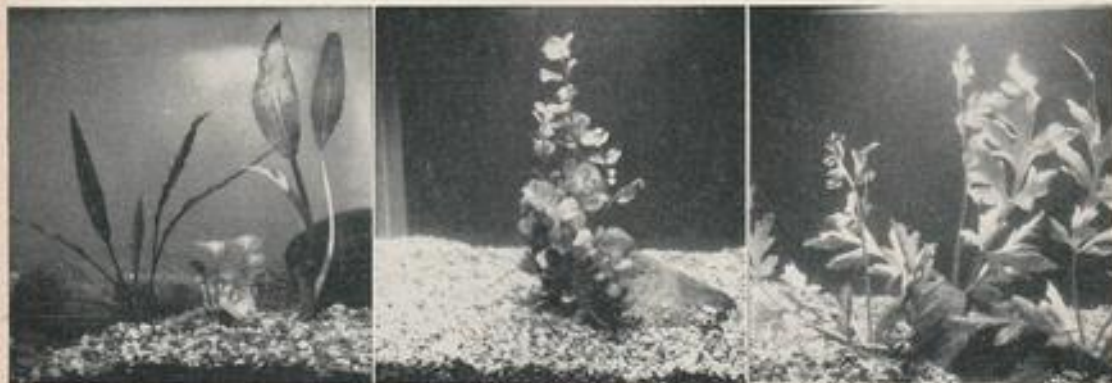
A genus which has been used in aquaria for some time, but whose species are always very expensive, is *Amblystichia*; *A. lanceolata* (water aspidistra) is most frequently seen, and it has thick, tough, glossy, dark-green leaves about 6 in. long and up to 1½ in. wide, rising from the root stock. This species, and its relatives, *A. nana* and *A. congensis*, are slow growing and their leaves stay fresh for a long while. They reach their full length of 2 ft. only if grown under natural bog conditions. When the root stock grows sufficiently large it may be divided; this is the only real method of propagation as seeds are rarely available. Just as uncommon as *Amblystichia*, but slightly less expensive, is *Aglaonema simplex*, which comes from Malaya. This should be called a "spear plant," because its pale-green leaves are beautifully shaped, like a perfect spear-head, with fine,



*Cryptocoryne griffithii*, *C. willisii* and *C. versteegi* (left to right)

tapering point and entire edges. This plant is also slow growing, and produces a new leaf from the crown about every 3 weeks; it has strong roots and seems to do well in ordinary gravel. I have never yet seen it flower.

From the large *Echinodorus* genus, there are two species which are uncommon; these are *Echinodorus rostratus* and *E. cordifolius*. The first is similar to an Amazon sword-plant but has very narrow leaves with a prominent mid-rib and a slight twist similar to that of *Vallisneria spiralis* var. *torta*. It is fast growing, as is *E. cordifolius*, which used to be called *E. radicans*. When grown from the young stage this plant produces its very beautiful broad green leaves symmetrically from its crown; unfortunately there is a tendency for the leaves to grow into floating and aerial



Left: *Cryptocoryne willisii* and to its right the Malayan swordplant (*Aglaonema simplex*). Centre: Water moneywort (*Lysimachia rotundifolia*). Right: Indian fern (*Ceratopteris thalictroides*)

leaves with nothing but stalks below water; this is natural, and later white flowers will be produced and abundant seed will be set. As a specimen plant, however, we must try to maintain its foliage beneath the surface and this can usually be accomplished by ruthless trimming of the leaves.

Similar pruning is necessary with most of the *Aponogeton* genus, as here again we are trying to maintain the plant in an un-natural habitat. Only *Aponogeton fenestratus*, known as the Madagascar lace plant, has permanently submerged leaves and these are beautifully latticed as a result of the decay of the tissue between the veins. The leaves are tough but the stems break easily and the plant needs careful handling. Some people say that alkaline gravel and fertilisers are necessary for good growth, whereas others grow the plant successfully in clean sand. It is always rare and usually imported in bulb form. This and all other *Aponogeton* species should be left in one place if possible as it takes the roots a long time to re-establish themselves.

*A. undulatus (crispus)*, *A. natans* and *A. ulvaceus* are also grown for underwater effect, but all three must be cut back frequently if they are to be prevented from spreading their leaves on the surface. They all need a good light and plenty of room; the bulbous root stock must be firm and should not be buried too deeply in the gravel. *A. undulatus* has beautifully furled leaves and one American aquarist has hybridised it with *A. fenestratus*. *A. natans* has pale-green linear leaves about 1 to 2 in. wide and up to 18 in. long. *A. ulvaceus* has leaves of a similar length and colour but up to 6 in. wide and twisted like twisted *Vallisneria*. All these plants come from Madagascar and the Ceylon region.

The flowers of these species are small and aggregated on aerial spikes which may be double or even triple. Much more spectacular flowers are produced by other *Aponogeton* species which also have floating foliage; *A. distachyus* is the Cape water lily and has white flowers with black anthers and a scent of hawthorn, and it is hardy in this country whereas other species, e.g. *A. leptostachyus*, may be grown only in tropical tanks or pools.

*Spiranthes odorata* is the Florida water orchid, which is another bog plant that needs at least 8 hours of light per day in an aquarium. The tuberous roots are essential for growth as they contain mycorrhizal fungi. *Lagenandra lancifolia* is of similar appearance in having lanceolate leaves rising from the gravel, but it is one of the few variegated plants ever grown in aquaria; it has a silvery edging to the leaves. A short while ago a new fern was introduced as an aquatic plant from the Indian region; it is of the genus *Gymnopteris* and has strap-shaped leaves.

#### Dwarf Plants

There are a number of very interesting plants among the genera which are grown as dwarfs set down in front of strata rockwork and large stones to relieve the contours and give a picturesque effect. *Eleocharis acicularis* forms thickets of fine, cylindrical leaves which contrast well with the usual types of underwater foliage. It has poor roots and needs very good light, but when planted in very fine compost it grows rapidly to a height of about 6 in. and spreads horizontally by runners.

Four genera of dwarf plants having spiky foliage are *Acorus*, *Isoetes*, *Littorella* and *Lobelia*. The two species of *Acorus* usually grown are *Acorus gramineus* and *A. pusillus*; the first is sometimes seen in a variegated form. *A. pusillus* is the dwarf Japanese rush, and the slender, tapering leaves grow to a length of 3½ to 4 in. from the tough rhizome. The leaves are produced in fairly quick succession and the foliage becomes fan-shaped; propagation is easy by dividing the rhizome but the plant is often difficult to anchor.

Although *Acorus* is a true flowering plant (it is a relative of the sweet flag of the pond) *Isoetes* is related to the ferns, but is quite unlike them in appearance. *Isoetes lacustris* is



Water chestnut (*Trapa natans*) showing the horned "nut" and junction of primary shoot, dormant secondary shoot and upwardly directed root. Newer roots are growing downwards and other roots forming in the place of leaves are seen on the primary shoot.

the commonest species, known as the quill-wort on account of its spiky, quill-like leaves which grow erect from a stout root stock. The outer leaves usually have female spores in cavities at the bases; male spores are similarly borne on inner leaves. The plant is native, growing in lakes and tarns with water poor in dissolved salts, or on peaty substrata. It may be slowly acclimatised to the tropical aquarium, but flourishes only in cold water. A native plant which does grow well in warm water is *Lobelia dortmanna*, related to the campanulas; it is dark green in colour and has narrow, erect cylindrical leaves arising from the root stock. These leaves bend horizontally at the tip, and in cross section are seen to have two, longitudinal air canals. These probably account for the amazing buoyancy of the plant which, in spite of its profuse white roots, is always difficult to anchor in the gravel. In a good light it will produce a sturdy, leafless stem which grows out of the water and bears beautiful, bell-like lilac flowers. *L. dortmanna* is locally abundant on acid substrata but is the only native aquatic member of the very large family Lobeliaceae. This family forms a contrast to the Araceae, which has been fully exploited by aquarists, giving all the *Cryptocoryne*, *Lagenandra*, *Acorus*, *Calla* for the tropical aquarium and bog garden. Shorter, spreading leaves are produced by *Littorella uniflora*, the spinewort or shoreweed, which grows as masses of dark-green foliage carpeting sandy and gravelly shores of native lakes and ponds. It grows best in shallow water, only flowering when exposed to the air, but it will become acclimatised to warm water in an aquarium.



Left, *Aponogeton undulatus*; right, *Echinodorus radicans*. *Marsilea quadrifolia* is growing in front of the rock

In suitable gravel it produces many slender stolons which root and form rosettes of leaves at the nodes.

*Samolus parviflorus* is a tropical plant belonging to the Primulaceae (cf. *Lysimachia*) and forms carpets of bright, jade-green rosettes growing about 2 in. high. These will flower freely, but the plant increases fairly quickly by very short runners which form young rosettes all round the parent plant. *Hydrocotyle vulgaris* has a creeping underground stem which sends up vertical shoots at intervals; these each bear a flat, round, indented leaf which gives the plant its name—water pennywort. The plant is little use in front of rocks, however, once the stems really start to lengthen, and this is unfortunately a natural tendency.

*Oenanthe fistulosa*, the water dropwort, is, like pennywort, a native member of the family Umbelliferae and it grows naturally in shallow water, producing aerial foliage and pretty white flowers. The plant is a biennial and produces offsets from the submerged base of its stem; these

offsets grow very well as dwarf foreground plants in tropical aquaria, with delicate, much-divided leaves borne erect on hollow, pale-green stems.

A plant which keeps its height much more steadily is the fern *Marsilea quadrifolia*. This plant looks just like an underwater four-leaved clover, and is very attractive as a dwarf plant. The fronds do not unfurl until the stem has reached its prescribed length; the plant increases rapidly by means of the branching rhizome, but the other method of reproduction, by spores borne in bean-shaped sporocarps at the base of the stems, is rarely seen in aquaria.

#### Floating Plants

In addition to shading the aquarium from excess of light, floating plants are usually just as attractive and interesting as those grown for underwater effect. They are often difficult to grow, however; this may be due to the proximity of the bulbs and their very bright light, and at times con-



*Hydrocleis commersonii* (centre) and *Eichornia crassipes* (to the right) making good growth in a tropical pool



siderable close heat, but it is certain that most floating plants grow much better in the even heat and diffuse illumination of tropical pools. Most of them will grow for a considerable time in the very humid atmosphere above tropical aquaria and may even flower. *Riccia fluitans*, *Azolla caroliniana*, *Lemna minor*, *Lemna trisulca* and *Salvinia brasiliensis* are all reasonably well known to aquarists; all reproduce very rapidly and need periodic thinning-out. *Riccia* is a liverwort and the mass of dichotomously branched thalli forms an excellent refuge for fish fry. *Lemna minor* is probably the most difficult to get rid of, and is not nearly as attractive as the ivy-leaved species, *L. trisulca*. *Azolla* and *Salvinia* are both ferns, and the delicate, lacy foliage of the former assumes a reddish hue in autumn when it is naturalised, whereas the latter is attractive at all times, with its velvety leaves covered with water-repellent hairs.

*Hydrocharis morsus-ranae* and *Trianea bogotensis* are both frog-bits, but the latter does need warmer water. Both spread rapidly by sending out runners forming new plants at their tips; in the autumn these runners form winter buds which break off, sink to the bottom and then develop into new surface plants the following spring. The actual bud is known as a turion and is enclosed by two scale leaves. The leaves of *Hydrocharis* are orbicular and from their midst flowers are occasionally produced; they are erect and aerial, and about 2 cm. in diameter, consisting of crumpled white petals.

The plant, which is locally common and believed to be diminishing, gives its name to the family Hydrocharitaceae, which I have mentioned already in connection with *Elodea*, *Vallisneria* and *Hydrilla*. These three genera are all submerged and have a similar method of flower production and pollination at the surface; generally male and female flowers are borne on separate plants, but only in *Hydrocharis*, the fourth and floating genus, have both flowers been common in the British Isles. *Vallisneria* is, of course, not native, and in *Hydrilla* no flowers at all have been recorded. In *Elodea* the male plant is exceedingly rare, and the same is true of the fifth and last genus of the family, *Stratiotes*, whose native species, *S. alodes* is the rare floating plant, the water soldier.

Young plants are suitable for the aquarium, although wild plants grow to a height of 15 to 20 in.

The water soldier reproduces by stolons, forming rosettes of rigid, brittle, spiny leaves resembling an aloe or the foliage of a pineapple, and the white, three-petalled flowers are occasionally produced. A few hermaphrodite plants have been recorded, but otherwise all the plants are female and are found mainly in the east of England, in ponds, and ditches in calcareous regions. The seasonal floating and submerging of the plant has been said to be due to variations in the amount of calcium carbonate secreted on the leaf surface.

There are therefore many points of interest in this family. Composed of four native genera and one introduced, no two are similar in vegetative appearance, and it is their mode of flowering which relates them. The three permanently submerged genera have very similar pollination mechanisms, and the two floating genera are similar in floral structure. All the genera are rare and diminishing, except *Elodea*, which, however, has diminished from its climax at the turn of the century, and is better described as widespread rather than abundant. Finally, the significant absence of male flowers; *Hydrocharis* has flowers of both sexes in this country, *Elodea* and *Stratiotes* nearly always occur as female plants with only one or two old records of male plants, *Vallisneria* has been observed flowering in aquaria, but is known to be naturalised in only a few places, and *Hydrilla*, known only from Esthwaite Water, has never been observed in flower there; in contrast with all this, vegetative reproduction is well developed in all five genera.

*Utricularia* is one of a number of interesting insectivorous plants, but whereas most of them grow on boggy soil, this genus is truly aquatic. *Utricularia minor* is most frequently found in aquaria, and it grows floating just beneath the surface as a mass of finely divided leaves, amongst which are structures adapted for the capture of minute water animals, such as small crustaceans. There is very little danger of these bladders capturing young fishes.

*Pistia stratiotes* (water lettuce) and *Eichornia crassipes* (water hyacinth) have been grown in aquaria for a very long time, always fetching high prices among plants. The



Left, *Acorus pusillus*; right, *Cryptocoryne versteegi*

reason for this is obscure—they are so common in the rivers of Africa, U.S.A. and South America, and such is the speed of their vegetative multiplication that they have constituted serious dangers to navigation; why then, if cheap to import, are they so expensive? *Pistia* has beautiful rosettes of pale-green velvety leaves beneath which hang many trailing white roots. *Eichornia* has dark-green leaves with swollen buoyant stalks and long masses of fine roots. It produces a superb flower stem, bearing large pale-violet flowers, to a height of about a foot. Both these plants grow well in pools; they may also grow well for a time in aquaria, but they often die away for no apparent reason.

In addition to the *Aponogeton* species already mentioned for their surface flowers there are three other plants useful for large tropical aquaria. *Limnathemum nymphaeoides* grows best if first rooted in the gravel, from whence it sends up to the surface lily-like leaves and very pretty yellow flowers whose petals are shaggy fringed. *Limncharis humboldtii* and *Hydrocleis comersonii* both belong to the family Butomaceae (the flowering-rush family) and both have yellow flowers. *Hydrocleis* has rounded leaves which are very sturdy and tough, and both plants reproduce quickly by runners.

Other than the many varieties of lilies, the only floating plant remaining is the Chinese water chestnut, *Trapa natans*. This is best purchased as the "nut," which is a curious dark-brown structure with four horns and exquisite sculpturing on the surface. This germinates and a hypocotyl emerges from which grow one or two shoots and one main root with many laterals. The root is at first negatively geotropic, and grows towards the surface, and the shoot, on reaching the surface, produces the most beautiful rosette of triangular, serrated, bright-green leaves, from whose midst a pretty white flower is sometimes produced. *Trapa natans* is an annual, related to, of all plants, the willow herbs, and its fruit, the curious "nut," is used as food in the Far East. It was present in Britain before the Ice Age, and has been recognised in post-glacial peats in the Hebrides, but is now extinct here.

## The Garden Pond in January—by ASTILBES

IN January the pond can look anything but tidy, but a lot will depend on whether most of the dead leaves were cut from the flags and other pond-side subjects at the end of last year. The less the pond is interfered with the better at this time of the year as the fishes are much better resting and conserving their energy whilst the water is very cold. The less they move about the less food stores will they use up and the better will they be able to go through the winter in good condition.

Remember that much of the trouble with pond fishes, such as fungus, usually breaks out when they are in an impoverished condition at the end of the winter. When the water starts to get a little warmer in the early spring the fungus may first show itself, and it is generally the fishes which are not in good condition which are attacked first. The disease can be cured, but it is not easy to deal with as once a fish is cured it has to be returned to the pond, when it can get another attack.

As long as the water in the pond looks clear and has no smell there is little to worry over. If, however, the water takes on a murky or milky hue and smells badly trouble may soon be forthcoming. If the pond should freeze over when the water is in this condition then the water will become so foul that all or many of the fishes can die. Change a large quantity of the water as soon as possible if it appears to be

foul. Also if the water freezes over see that at least one hole is made to let out the foul gases and let in some fresh oxygen. Some pondkeepers make a small hole and then lower the level of the water slightly. This may prevent further freezing, but it will not do so if the weather is very severe.

To prevent cracking of the concrete in very severe weather it is a good plan to make a small opening all round the pond to relieve the pressure. The water can be filled with boiling water is the best way of making a hole in the ice, but this method will not do for clearing a space all round the edge. This can be done by letting the hose run onto the edge and gradually working round the pond as a small channel is made. With a small pond, kettles of boiling water can be poured round the edges to make the opening.

If the pond is anywhere near an industrial town there is sure to be a considerable film of soot and filth on the surface of the water after foggy weather. This should be removed as soon as possible, and can best be done by allowing the hose to run into the pond until it overflows. The film of dirt will then be flushed off, leaving the water clear once again.

## Meteor Minnow



Photo:

W. A. Newspapers Ltd.

The upper specimen of this pair of White-cloud-mountain minnows is a veiltail form developed by Mr. Len Lawson, vice-president of the Aquarium Society of Western Australia. His strain is reported to be breeding 25 per cent. true to the new veiltail form, which has been named the meteor minnow. The lower fish is one of the original stock in which the mutation developed. The strain was first exhibited at the Australian Society's fourth annual show.

# The Colourful Dwarf Cichlids

by JOHN S. VINDEN

SOME years ago, if an aquarist said he specialised in cichlids one knew that he was one of the big men of the hobby, for most of the species available before the war were suitable only for people with very large tanks and deep pockets. These fishes had other disadvantages; they were aggressive, destroyed plants and had other features that prevented the ordinary aquarist from keeping them at home. In spite of this, they had their adherents as long ago as 1884, and *Cichlasoma facetum* was spawned in this country, by the Rev. Gregory Bateman, as early as 1897!

In recent years we have seen the introduction of many species of dwarf cichlids, and the popularity of this family is growing day by day. If one looks at these fishes when in good condition it is easy to see why more and more aquarists are keeping them, for they have many points in their favour apart from their general beauty and attractiveness.

## Small-Aquarium Inmates

The dwarfs, unlike their large cousins, can be kept happily in quite small tanks, and a 24 in. tank will support a community of these interesting fishes. They can be bred in even smaller tanks, but, as with all fishes, the young are easier to rear and grow on if given plenty of space. Their breeding habits are more interesting than those of most other fishes, and they usually make excellent parents. They appear to show more intelligence than many fishes and, without exception, they are beautiful to look at.

They have yet one more point in their favour that is an important one to many fishkeepers to-day. This is that



Photo:

Laurence E. Perkins

*Apistogramma agassizi*



*Nannacara anomala*

although they can be bred fairly easily they have not yet been bred sufficiently to become a drug on the market, so that the successful breeder should experience no difficulty in disposing of his broods.

The requirements of dwarf cichlids are fairly simple. Unlike the larger members of the family they do not tear up plants, so they can be kept with other fishes in normally planted tanks at temperatures around 75° F. They appreciate plenty of plants for, although not generally shy, they like to retreat into thickets if they imagine that they are in danger, and if kept in unplanted tanks they will not display all the brilliant colours for which they are justly famed.

Like all the members of the family to which they belong they are strictly carnivorous fishes and, when possible, live food should be offered to them. This requirement, however, need not deter those aquarists who have difficulty in obtaining regular supplies since they will eat chopped garden worm, shredded raw beef, fresh or tinned shellfish and also good meaty dried food. The cheaper dried foods that have a basis of biscuit meal, although possibly suitable for common goldfish, should not be offered to dwarf cichlids, for they will be rejected and will soon foul the water.

## Apistogramma Species

There are probably some 20 species of aquarium fishes that qualify as dwarf cichlids, but not all of them can be obtained at any one time, so I propose to limit descriptions of individual species to those that the aquarist has a chance of obtaining through present-day trade channels. A selection from these species should provide a tank with every colour of the rainbow.

One of the first of the dwarf cichlids to reach the aquarist was *Apistogramma agassizi*, and owing to its beauty it has retained its popularity ever since its introduction before the war. The male of this peaceful fish has a background of brownish yellow, a brilliant purple back and an intense black line running from its nose to the tip of its pointed tail. The fins show a blue sheen and, apart from the tail, are edged with red. The tail of the female is rounded, as are her dorsal and anal fins.

*Apistogramma ramirezi* is deeper in the body than the former species, but rivals it for colour; for apart from black, yellow, orange, red, blue and green can all be seen on this desirable little fish, which is quite at home in the ordinary community tank. *A. reitzi* has a green back which pales down the sides to yellow, the operculum has blue streaks and the fins of the male are longer and more pointed than those of the female.

One of the most beautiful of the *Apistogramma* is *A. "U.2"* or, to express it less briefly, *Apistogramma* unidentified species number 2. This fish has been offered from time to time for over 20 years, but it is my belief that the fishes on offer have not always been of the same species. The ones offered to-day, however, are exceptionally handsome fish, the males of which have a lyre-shaped tail and a

elongated. Its anal and ventral fins are blue, and it has the distinction of laying eggs of a bright red.

#### *Nannacara* and *Pelmatochromis*

Amongst the easiest of the dwarf cichlids to breed are the *Nannacara*. Not many species of these have reached the aquarist, and of these the most readily available is *N. anomala*. This fish is not so long in the body as most of the dwarfs, but is far from inelegant for the male's dorsal and anal fins are edged with red, and the scales on the body have green edges.

The fishes so far mentioned are all from America, but Africa has given us some very brilliant species of the genus *Pelmatochromis*, of which *P. kribensis* is perhaps the best known. This fish is probably the most colourful dwarf cichlid there is, for bright red and blue almost cover the body though other colours appear in different lights. Although before the war *Pelmatochromis aeneus* was kept in America for a short time, it does not appear to have established itself, and those recently imported from Africa by Shirley Aquatics Ltd. would appear to be the first correctly identified ones that have reached this country. This fish has been confused with *P. fasciatus*, which is not

male is much smaller. It has a bluish back, yellowish sides and has a pink glow on the under surface. When it is in condition horizontal stripes and vertical bars can be seen, which makes this a very distinctive fish.

Two other attractive dwarfs arrived in the same African consignment. These are as yet un-named *Pelmatochromis*, with a reddish back and a latticed tail, and *Nannochromis nanaiceps*, a very distinctive fish which has not been called the blue dwarf cichlid without reason. When seen at its best it is a clear cold blue with a white-edged dorsal fin. The sexes of this fish are not so easy to identify as most of the dwarfs.

Many of the dwarfs are secretive when breeding, and retreats in the form of flower-pots or rockwork should be offered to them. Whether to leave the eggs with the parents, and run the risk of their being eaten, or to raise the young artificially, depends to a large extent on the conditions prevailing and on the temperament of the individual fishes. If they can be left, much pleasure will be derived from watching the parents bring up the young.

The dwarfs are all attractive fishes, and the fishkeeper who has none in his tanks is missing more than he knows. Once an aquarist has kept some of these species, sooner or later he will become an addict and want them all!

## TROPICAL FISHKEEPERS' REFRESHER COURSE:

by *Pisces*

### Rice Fish or Medaka

(*Oryzias latipes*)

ORDER: Microcyprini, from Greek *mikros*—small, and Greek *kyprinos*—a kind of carp.

FAMILY: Cyprinodontidae, from Greek *kyprinos*—a kind of carp, and Greek *odontos*—tooth.

SPECIES: *Oryzias*, from Greek *oryza*—rice, and Latin *latius*—broad, and *pes*—base.

**M**EDAKAS are natives of the Orient, and chiefly attractive to many aquarists because of their comparatively small size and most interesting breeding habits. George S. Myers, in *The Aquarium Journal* of October, 1952, refers to them as "easiest of all to spawn and raise," which should rouse hopes among the host of tyro breeders.

A large tank is definitely not one of the requirements of rice fishes—even a one and a half gallon receptacle is suitable to accommodate a pair of them. It should be provided with a few fine-leaved plants. Temperature is not of paramount importance. In fact, few of our "tropicals" can stand as low as 45° F., but the medaka can. At the other end of the scale it can tolerate 80° F.

There is not much point in keeping them at all unless you intend to breed them, for they are not very "showy" fishes. They do act as foils to more colourful species, of course! There are two varieties—one grey, one golden. The golden is not of an overall colour like a goldfish, but has a yellowish orange hue covering the upper two-thirds of the body, and fading into a silvery belly. The eye is pale green. This is much more attractive than the grey variety.

Sexes are easily distinguished in fishes over an inch in length. Perhaps the most distinctive feature is the anal fin, which in the male is larger, with a straight or convex outer margin. The female's anal fin is concave. The dorsal of the male is also larger than that of the female.

For best health and breeding condition, the medakas, although not fussy about food, should be fed with a large proportion of live foods—*Daphnia*, *Cyclops*, brine shrimp,



Female medaka with eggs

micro worms, Grindal worms, mayfly larvae, gnat larvae and pupae—all are relished and eagerly consumed. Spawning is likely at between 68° and 75° F.

With well-fed healthy adults, spawning is not a problem, rather the reverse—it can hardly be prevented. And it is frequent, every fortnight or even less sees a fresh batch of eggs produced. They do not drop to the bottom of the tank, or stick on the plants at first, but are exuded by the female and remain attached to her, each one suspended by a tiny filament. There are not many at a time—about a dozen or so.

It would be interesting to know why this provision of nature exists. One could advance some highly imaginative theories concerning it, some plausible, some impossible, but no one so far seems to have investigated the reasons. Possibly the difficulties are insuperable.

It would be more understandable if the female carried the eggs round until they hatched, although suspended like a small bunch of grapes, for everyone to see, they seem to me to be in a peculiarly susceptible position—a tit-bit for any hungry passer-by. But the eggs are brushed off by the female on to the plants within a few hours, and they remain there, adhering by means of the threads. Snails should be rigorously excluded from the rearing tank.

The fact that there are so few eggs produced at a time is a good indication that a fair proportion of the young will survive. It is the fishes with many enemies which produce hundreds upon hundreds of eggs at a single spawning.

Each batch of young should be raised separately. They hatch a fortnight after laying, at which time, of course, the parents are producing, or have produced, another batch of eggs. As the youngsters grow, which they do quickly on a live-food diet, they tend to become cannibals, particularly towards their new-hatched relatives. The moral is obvious: sort them in sizes!

# AQUARIST'S Notebook



by

RAYMOND YATES

FOR the first time ever the British Aquarists' Festival was held in November, never a good month in Manchester. In the event there was no need for alarm. The fog not only kept away but the show was once again favoured by bright, cool weather as every year since its inception. Surely the old joke about Manchester weather has worn thin by now. True, late on Sunday afternoon heavy rain fell and it became rather gloomy, but by then the show was almost over and was already an established success.

However good the attendance on a Saturday, the main crowds roll up on Sunday and this B.A.F. was no exception. The dealers all did a roaring trade, to judge from the crowds round every stand, and enthusiasm for the hobby seems as strong as ever. Knowing so many of the visitors to this show over the years I was particularly struck by the fact that this year the accent seemed to be on youth, most of the visitors being on the younger rather than the older side. As usual aquarists came from far and near and it was a pleasure to welcome one moment visitors from Wandsworth and the next minute some from Middlesbrough. So it went on.

A break with the lay-out of the last few years resulted in a sort of halfway house between mere formal showing and the theatrical staging of yesteryear. The general opinion was that a really happy medium had been struck and there was no doubt that the public "took" to the set-out right from the start. Many of the club surrounds were really first class and had entailed a great deal of time and labour. I appreciated the use of tinted and sprayed corrugated cardboard and wallpaper; inexpensive but effective. The standard of fishes on view was higher than for some time and, on this occasion, the visitors could get close up to every tank to study the inmates. There were also more cold-water fishes on show than for some years.

A feature of this show were the "Aquascapes," which left everything to the designer. There were some very charming effects obtained, moorland streams, willow-pattern plate, old coaching inn, ornamental water gardens and a fascinating setting of "Treasure Island" complete with stockade and the most realistic figures. This attracted particular attention, and the designers, Mr. and Mrs. Kelly, could have little difficulty in disposing of this showpiece to one of the large stores for a Christmas attraction or for advertising purposes.

It was obvious, looking round the enormous new hall, built since the fire at Belle Vue earlier in the year, that the "Aquascapes" were far and away the most popular exhibits with the general public. As they were not all grouped together but individually, one on each club stand, it was possible to look round and observe how many people congregated round each of these compared with the ordinary tanks. The Belle Vue Club stand was charmingly set-off with blooms and flowers in pots, provided by Mr. N. Boardman, an aquarist with very green fingers.

At *The Aquarist's* stand, with Mr. Boarder, I was asked quite a lot of questions, although rather less than in previous years. Can it be that the spate of books on the hobby in recent years has at last produced a more knowledgeable mass of aquarists in general? One gentleman even brought along test tubes containing specimens of something new to his tanks and these were identified by Dr. F. N. Ghadially for him. It was good to see Dr. Ghadially once again at the show. He tells me he has left the Sheffield Club and is now joining Manchester (Belle Vue). Sheffield and Yorkshire club members generally were well represented. Nottingham and Midland enthusiasts were also well to the fore and

I was pleased to meet a party from Wolverhampton, a town which is apparently on the aquatic as well as the football map! I was surprised by numerous references to toothed carps . . . it looks as if this variety is coming to the fore again.

Dealers were there in force and had quite large stands with thousands of fishes on sale. After all, that is what many of the visitors come for, the chance of picking up specimens rarely seen in their own town. Many reptiles and birds were also on sale and I had quite an armful with two Siamese kittens. Cacti stands had an attractive display.

It was surprising what a large number of lady visitors were attracted to the show and in this connection one visitor from Oldham approached me in a bit of a difficulty. It appeared that he had 400 females to look after, and I was just wondering what sort of advice I could possibly give in such circumstances when it transpired that they were female platys! Being very much R.N. myself I have often wondered what made life possible in army barracks. However, the answer was supplied by a young soldier from Catterick Camp who called at our stand and mentioned that "Getting *The Aquarist* at camp is the event of the month . . . you've no idea how I look forward to it."

A factor new to me at the B.A.F. (but not elsewhere) was being asked by several people to explain to them why they had not obtained a place with their entries. This is not always easy but when one has done considerable judging oneself it is usually possible to suggest where points have been lost, and it is amazing how these suggestions act like a tonic on the person who felt in doubt. Unbiased opinions are always the best.

The majority of the display tanks used were very small and tended to overheating. This was a fault which must be rectified at the next show. The tubular lighting in the hall was just right, particularly on Sunday afternoon when it suddenly became pitch black. I must mention one unusual decoration observed. This was the fixing of cypress twigs behind small display tanks. There is no doubt that it improved the viewing.

I feel sure that all who visited the show are looking forward to the next, however distant it may seem at the moment. We can't have enough shows like this.

In previous years visitors to the B.A.F. have also enjoyed looking over the Aquarium at Belle Vue Zoo. Mr. Gerald Iles, its former curator, took up a position in Canada last year, and more recently his successor has left to join the staff of a large northern dealer. Some changes have therefore proved inevitable. I had a quick look round the Aquarium and I was certainly disappointed. Many of the lovely fishes had disappeared, including all the cardinal tetras and clown loach, and five tanks had been given over to goldfish, not previously seen in the Aquarium for years. The large angels were replaced with a host of midgits and indiscriminate mixing and changed rockwork gave many of the tanks a forlorn look. I thought the presence of sea shells in the piranha tank rather peculiar. The most distressing feature, however, was the presence of vast numbers of *Hydra* in some of the tanks.

In last November's issue of *The Aquarist*, I mentioned that there seemed little interest in coldwater fishkeeping in the north. Since then I have heard from several northern

enthusiasts who would like to make the coldwater hobby more prominent. One gentleman tells me of his large pond with 50 fishes ranging from 3 inch goldfish to 2 lb. carp. I have had a word with one or two and put others in touch with each other. Meanwhile, perhaps there are more interested coldwater hobbyists in the north who would like to contact others, so here are a few addresses of some coldwater fishkeepers in the area: Mr. J. W. Coupe (27, Claremont Grove, Didsbury, Manchester 20) is a member of Belle Vue Club, and is in touch with about a dozen other local coldwater enthusiasts; Mr. J. G. Euston (12, Blackthorn Avenue, Burnage, Manchester 19) is the hobbyist from Leicester mentioned in my November notes; Miss P. Paul (17, Victoria Grove, Heaton Chapel, Stockport) is interested in fancy goldfish and there are several devotees who can be contacted through Mr. L. Baxter (83, Wardour Street, Atherton, near Manchester).

I have often bemoaned the disappearance of good-quality swordtails, and it is true that nowadays one sees good swordtails only at shows, when they are not for sale. Recently I called in a shop within walking distance of both the Lancashire County Cricket and Manchester United grounds, and in the course of talk with the owner and a lady hobbyist this topic came up. "What do you mean, never see any," said the owner, and he took us round the back of the shop. There in a tank were about a hundred 3 to 4 inch swordtails, real red, no brickwork tint, mostly with sword only just beginning to show. "I have a job to sell these, even at 3s. 9d. each," said the owner. The reason was that the whole lot were males; not a female was amongst them. I was rather surprised that this should interfere with sales, because most people would jump at large bright swordtails to live up their tanks. It seems that people must breed livebearers, or try to, or they are just not interested. Large swordtails bully other swordtails, of course, and they are great jumpers, but what an opportunity missed. There must be many hobbyists to-day who have never owned really decent red or green swords, let alone red-eyed reds, Berlins and the like.

What effect has the hobby on your sex appeal? Not so silly a question as it seems. Recently a Sunday newspaper published one of those questionnaires where one ticks off answers and then adds up points obtained, the subject being sex appeal. One of the questions asked which of a list of zoo animals was your top favourite. Points awarded varied from two to nothing. Having read this far I expected fish to score no marks at all in the matrimonial stakes, but in fact they were rated one mark in company with lions and tigers, whereas reptiles scored a blank, monkeys being their odd bedfellows. Top marks went to elephants, bears and (I'm sticking my neck out here because I can't think why) giraffes. I am not sure what all this proves. Can the fair sex really approve of the chap who keeps elephants or bears or giraffes in the house? It is possible that an invitation to "Come and see my tropical fishes" ranks equal with the opportunity to stroke a pet tiger? As for reptiles, I cannot say I am surprised to find that they rank with monkeys, and perhaps etchings, at the bottom of the scale. Coming back to our finny pets, surely some of them are worth top marks on the glamour scale . . . kissing gourami, bleeding-heart tetra, jewel fish, archer (cupid) fish, angels, to mention but a few.

Mr. Jack Errington, of Southsea, tells of a holiday visit to Cheddar Gorge. Outside the entrance to one of the caves there is a large restaurant which boasts a magnificent pool which occupies the entire roof. The floor of the pool is of glass through which the customers can watch fish idly swimming by. I have not seen this myself. It seems rather

scampering Providence. When happens it seems that one like his food and, with nothing to do, bangs on the glass with father's umbrella. Something of this sort has been tried before elsewhere but, as far as I know, has never lasted long. Looking up at fish is tiring and the view hardly compensates for the effort. From below most fishes are unattractive. Side views are best. The formal style of most public aquaria seems likely to remain with us for many years yet.

It is reported that Dr. Alex Comfort, of the Zoology Department of London's University College, is studying records of horses and comparing the behaviour of fishes with that of mammals to see how they age under various conditions of growth. Aquarists could tell him quite a lot. There is no doubt that fish age very rapidly if they are expensive specimens, or rare types which you want to keep. On the other hand some fishes are real "Peter Pan" individuals, in particular those you want to grow on for a show, unwanted specimens you can't bear the sight of and young broods you have bred yourself. Week follows week and they are still schooling. Why can't some fish grow up?

During the winter season one sometimes comes across goldfish in dealers' tanks which are enjoying water warmed with a heater. If they are very valuable specimens this can be defended but where they are just rubbish or poor specimens of "fancy" goldfish they are best left alone. The dealer does this to prolong the life of fish which may be in a poor way. You can always tell by the listless posture, the wasted stomach and the presence of a fine white film on parts of the body. Healthy goldfish don't need coddling. The enormous numbers of wretchedly poor goldfish of all types offered for sale nowadays is amazing. How anyone can buy such junk is hard to imagine, because even to the uninitiated a sickly goldfish must stand out a mile. We hear now and then of the 6d. store fish which lived so many years in a bowl which never had the water changed, but we never hear any figures on the mortality. It would be interesting to know the total numbers of goldfish shipped to England in a year—surely 99 per cent. of these must die within the twelvemonth.

A recent arrival on the market is the artificial fish. Roughly life-size, and highly coloured in approximate colourings, can be obtained imitation tiger barbs, angels, cardinals, moors and other varieties. These are anchored to small pieces of lead and share pride of place with the magic Japanese water flowers of half a century ago. The fish appear to be made in Hong Kong. I do not know if the material or colours used are toxic but I have seen tropicals swimming round these interlopers with no obvious ill-effects. Some years ago some imitation sea-horses were obtainable from a French source and these were very real. These new arrivals are not in the same street, being much more crude, cheap and definitely out of place in a well set-up aquarium.

When walking along a disused canal recently I saw an angler landing a 12 in. roach. I congratulated him on his catch when no other anglers near by had caught anything. He laughed and held up his keep net, which contained five more roach, all a foot long. I asked him what magic bait he was using, and he said "Kraft cheese." This is not new, of course, but it can work. In the aquarium most fishes will eat such cheese in small quantities, particularly gouramies. I have experimented with flavoured types like Cheese and Onion Spread and it all proves acceptable. However, it must be fed in tiny portions.

# CELESTIAL GOLDFISH

Some further experiences of the breeding of this variety

by N. E. PERKINS

(Photographs by LAURENCE E. PERKINS)

**I**N the January, 1956 issue of *The Aquarist* an article appeared describing the eye development of the celestial goldfish from fry to adult. So far as I am aware this was the first occasion that this had been recorded, and one would have imagined that it would therefore have been received with interest by the goldfish enthusiast, especially as it was adequately illustrated by photographs which showed the various stages in this abnormal development.

However, some months later an article by one of the leading judges of goldfish varieties appeared in another journal, in which he stated that he had yet to meet the aquarist who could honestly state that he had bred the celestial and produced the desired abnormality of the eyes in the young. Perhaps this present article will finally dispel any illusions about the production of these fish, whilst it may also provide useful material for their culture.

On the first occasion when these fish were bred and photographed it is more than probable that the parents were from the same spawning, since they were obtained as very young specimens from a batch imported from China by Mr. A. Bowler, late of the South Bank Aquarium. The ensuing young were not particularly good fish, for although 50 per cent. produced the correct eye formation, web-tailed and single-tailed specimens together with types showing a disparity in the size of the eyes were very numerous. However, a perfect pair was retained and bred, but on this occasion the young were so poor that the entire spawning was destroyed before the advent of any eye development.

The next step was to cross the young male with his mother and here the result was very different. Apart from the



Pair of young celestial goldfish bred from the author's first pair. The male fish is on the left

fact that an unusually large proportion of the fry were good in fin formation and body shape, the eyes soon showed signs of exceeding the excellence of the original pair, which were amazingly good specimens. Only the very best were retained and of these the finest female was crossed with her father. Again the result was good and it was noticeable that the eye development was increasing in excellence, so that there was now no possible doubt that the original Chinese specimens had been surpassed.

Now, as to their treatment and general culture, perhaps a few observations may help to clear up the main question of the hardiness or otherwise of goldfish varieties in general. Their place of origin, as is well known, is China, where the winter conditions can far exceed in severity anything which we experience here, and it may be taken for granted that although in very recent years artificial heat may have been applied by breeders there in some instances, this has not been the case over the past 1,000 years, in which time the various goldfish varieties have evolved. The secret of their success with these fish probably depends on the very warm summers that the Chinese experience, which gives ample time to develop the fry sufficiently for successful hibernation and, of course, provide the necessary factor for quick coloration of the metallic types. However, the first two specimens of celestials I had acquired came straight from China, and I observed that these continued feeding in water of 40°F. and even below, whereas all other varieties were dormant. Since then I have kept them in outdoor pools the year round and they have proved themselves to be perfectly hardy, as are all types of fancy goldfish.

When, however, specimens are rare and costly it would obviously be unwise to have them all situated where observation was precluded, for the death of these developed types, especially of those with the enlarged eyes, may well stem from injury due to the rough concrete surfaces of a



The author's original pair of celestial goldfish, imported from China. The male fish is on the left



*This male is one of the young obtained by pairing the male of the second generation to the female of the original pair (i.e. pairing son to mother)*

pond, and failure to ensure adequate removal of decaying vegetation will cause the death of the hardiest of fish, once the pond becomes frozen over, because the gases evolved by this decay will be trapped by the ice and cause their asphyxiation. Such decay also increases the risk of bacterial infection, and whilst this may be slow to develop during the cold period, the rise in temperature with the coming of spring will quite likely produce an epidemic amongst the stock.

Personally, with rare types, I retain half the breeding stock in unheated aquaria, where observation is assured, and leave the other half to winter in the pond—thus ensuring that less fish occupy the pool during possible difficult periods and attempting to insure against the chance of total loss from a variety of possibilities if all were left out. Under these conditions I have noticed that unheated aquaria impose a far greater strain upon the fish (other things being equal) than does the pond, even when this is covered with several inches of ice. This is, of course, what one would expect, for whereas the entire volume of water in unheated aquaria can fall to freezing point during cold weather, the lower regions of a reasonable pond will not fall below 37.5° F. or 4° C.

Naturally, since we cannot rely on hot summers, it is advisable to use heat with the young in order to advance their development; a temperature from 70° to 75° F. for the first 3 months is quite sufficient, after which it is policy to give them natural conditions. Of course, I speak as one interested in fish as fish and not as a commercial project, where the rearing and retention of all fry, weakly or otherwise, by the continued application of heat is probably essential to establish a profit and the earlier spawnings achieved by the use of heat in winter may allow of a larger breeding season. The number of fish I retain from a spawning is usually very small—possibly not more than two dozen, which are later reduced still further, and even this number, from the point of view of a hobby, is more than sufficient.

The problem of the line-breeding of the celestial as described is, of course, one of eventual deterioration caused by failure to introduce new blood; this, however,

time to become apparent. However, provided that a sufficient number of the various generations are retained in health, the introduction of fresh blood should prove costly rather than difficult, thanks to the great advance in air transport.



*One of the males produced by pairing a female of the son-to-mother spawning with the male of the second generation (i.e. pairing daughter to father)*

## FINNY BUSINESS

by  
LD



*"Och! I like the aquarium fine enough, Aggie, but it's an awful wee light to read by!"*



## our readers



# write

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

Address letters to The Editor, *The Aquarist*,  
The Butts, Half Acre, Brentford, Middlesex

### Sea Gardens

WHILE being delighted to see articles and references to the attractions of British Marine fauna, I would like to make the following comment concerning the article "Sea Gardens" in your October issue.

The common species of anemone found on our coasts can be maintained successfully no matter where one may live and it is not necessary to live "near enough to the sea to be able to collect limpets, winkles, cockles or mussels".

Three members of this group keep some form of salt-water establishment and such specimens as common beadlet, daisy, opelet, plumose anemones, etc. have been maintained for periods of (so far) up to 3 years.

Foods have included fresh and cooked meats and fish, garden worm, *Tubifex*, shrimp, crab, etc.

In passing, I would add that in none of the tanks, jars, etc. now in use for the maintenance of these and other saltwater fish and crustacea is any form of aeration or filtration used—a fact which appears to cause considerable surprise to all groups with whom I have had the pleasure of discussing this subject.

H. J. VOSPER,  
Secretary,  
Brockley and District Breeders' Circle.

### Polythene Ponds

I WAS very interested to read in *The Aquarist* of Mr. Raymond Yates's experiences with polythene ponds.

Just over a year ago my concrete pond sprung a leak, and as I had heard of the many uses of polythene I decided to line the concrete with polythene sheeting. This was very satisfactory and withstood the ice of last winter admirably. However, during the summer I noticed that the pond was definitely leaking very slowly, and when last weekend I cleaned out the pond I found about 20 minute punctures in the sheeting on the floor of the pond, which I suspect were due to the unevenness of the surface of the concrete. The polythene itself also seems to have weakened and I doubt whether it would withstand another winter even if it were patched. So my thoughts turn elsewhere for solution to this problem of pond construction as a new sheet of polythene every year seems rather costly.

(Miss) DAPHNE TIMINGS,  
Birmingham, 17.

### Our Queries Page

ALTHOUGH I usually read your answers to queries published in *The Aquarist* with interest, I suspect that

these queries are in fact invented by your staff! I have heard of this being done by women's journals, but I think it not to be in keeping with the contents of a technical journal.

E. WOODS,  
Guildford, Surrey.

Mr. A. Boarder replies: *This question about whether the queries answered by me are genuine or not often arises! At any aquarist gathering I am almost sure to be asked the same question. There is certainly no need whatever to invent any questions! Up to the time I write this I have answered 1,498 queries addressed to "The Aquarist." I have all the names and reference numbers available for anyone's inspection. An average year brings in over 200 queries about ponds and coldwater fishes but not more than about 60 per cent. of the answers are published.*

### Methylene Blue and Algae

IT may be of interest to other readers to know how I eliminated blue-green algae after continual failure with various methods over a period of several months. The cure was completely fortuitous and an indirect consequence of white spot.

I was careless enough to introduce two new fishes directly into my aquarium and within a few hours they both showed the unmistakable white spots. Deciding to treat the tank as a whole I added drops of 1 per cent. stock solution of methylene blue to the water until it was a deep blue, adding further drops as the water reverted to its natural colour over a period of one week. No aeration was used, the sub-gravel filter was stopped but the top light was used as usual, giving the tank an attractive green-light grotto effect. At the end of the week the blue was removed from the water by means of the sub-gravel filter revealing a tank completely free from blue-green algae and no trace of white spot. The fishes did not apparently mind the "blue" one little bit and the plants have never looked greener, cleaner or fresher; they are all growing vigorously. I know that methylene blue is said to be harmful to plants but I feel this must only be so when used in very considerable strength.

All that happened about 8 weeks ago and I have since had no sign of either blue-green algae or white spot.

A. L. SCHOFIELD,  
Uxbridge, Middlesex.

# FRIENDS & FOES

No. 73

## Freshwater Winkles 2



*Paludina contecta*

### The Mollusca (continued)

**SPECIES:** *Paludina contecta*, from Latin *paludis*—a marsh, and Greek *komos*—cone, with Latin *tectus*—covered. Also called *Viviparus fasciatus*, meaning "banded live-bearer".

**A**LTHOUGH similar in appearance (to the casual observer) to *Paludina vivipara* or *Viviparus viviparus* (two names for the same species) there are, in fact, several distinct differences. Firstly *P. contecta* has a glossy shell, whereas the shell of *P. vivipara* is dull. Secondly, each whorl of the former's shell is comparatively low with squarer edges, making the whole snail shell "squat" than that of *P. vivipara*. On the top of the shell of *P. contecta* is a distinct and sharp point, which is almost completely absent in *P. vivipara*.

*P. contecta*, although less common than *P. vivipara*, is found not only in very slow-running waters but in stagnant water also. Here the differences between the two species cease.

*P. contecta* is a livebearer, has two distinct sexes and eats mainly vegetable matter. It, too, has an extremely hard shell, but with a softer trap door (operculum) with which to seal its shell. For this reason, aquarists are advised not to put a specimen or two in with their fishes as live food. The chances are all against them being eaten, and all for them dying un-noticed behind some plant or stone, a very real source of danger to the health of the fishes. If desperate for live food, and if nought else is available (frankly, I can't imagine this), drop the snail into boiling water to kill it, then remove it from the shell with a pin and suspend in the aquarium for the fishes to nibble at; alternatively cut it into small pieces with a razor blade and drop these in piece by piece, removing any which remain uneaten.

C. E. C. Cole

- PICK YOUR ANSWER**
- The naturalist Pallas, who named many aquarium fishes, was: (a) French. (b) German. (c) Italian. (d) Swiss.
  - A distinguishing mark between *Thayeria obliqua* and *Thayeria zosteromelana* is to be found in the: (a) Anal fin. (b) Caudal fin. (c) Dorsal fin. (d) Pectoral fin.
  - Corydoras melanostomus* (the Orinoco catfish) was named by: (a) Elwin. (b) Gill. (c) Jenyns. (d) Regan.
  - Madras piecha is a popular name of: (a) *Aplochelichthys bleekeri*.

# The AQUARIST Crossword

Compiled by J. LAUGHLAND

1	2	3	4	5	6	7	8	9
10				11				
12		13	14		15	16		
17		18			19			
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36		37			38	39		
		40			41	42		
43			44					

### CLUES ACROSS

- Water plantain for the aquarium (6,6)
- To straggle in growth (3)
- Popular term for the long "feathered" legs of the water boatman beetle (4)
- Ruff or pope in a race? (7)
- Separate article a mite confused (4)
- It leaves 15 returning (2)
- Bathe lap (anagram) (8)
- Fellow of an institute (1,1)
- Can be partial cure for a base creature (3)
- Bill may provide beheaded bell at the main part of this request (5)
- Pet grows smaller as it follows (6)
- Neon loses its head with age (3)
- Great industrial group from half icide (3)
- Motorists' organisation (1,1)
- Bird, perhaps, or stickleback, gourami or Betta (4,5)
- Spanish affirmative (2)
- Recess at east end of shore may seep (4)
- Brief measure (2)
- Flags suitable for water gardens (6)
- Compete (3)
- Valuation (10)
- Female (3)
- Sanurating (8)

### CLUES DOWN

- Beginning at end of sexless reproduction (12)
- Lovely fabric or lovely aquarium plant (4)
- Orfe (3)
- In a way fish scales are such a protection (4)
- In a way he had his house in an aquarium (4)
- In prescriptions, of each a like quantity (2)
- Feeding stream (9)
- Starfish (7)
- Some total (3)
- Flow for the wading bird (4)
- Notary Public initially (1,1)
- And the net loses its head, also Brutus! (2)
- One-spot, not a gourami (20)
- Fishes' limbs (4)
- I'm sent and mixed up with Ed. in the dregs (8)
- There may be goldfish in that there ore, properly treated (3)
- Slim pet, suckers! (7)
- "The Freshwater Shark" (4)
- Kind of cinnamon (6)
- Small labels for fastening to fishes to check on their movements (4)
- Descendant (5)
- Welsh salmon river (3)
- French water (3)
- Passage of the body (3)
- Short mountain, not necessarily low (2)
- Trustee, in short (2)

- (b) *Aplochelichthys lineatus*. (c) *Aplochelichthys melanostigma*. (d) *Aplochelichthys parichthys*.
- Cyprinodon bellotti* (the Argentine pearl fish) reaches a length of about: (a) 1 in. (b) 2 in. (c) 3 in. (d) 4 in.
- Barbus camogili* is native to: (a) Assam. (b) Burma. (c) Ceylon. (d) Sumatra.

G. F. H.

(Solutions on page 220)



## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

AN illustrated lecture on Pond Life by Hastings schoolteacher Mrs. F. Inskip, was well received by the members of the **Bexhill and District Aquarists' Society** at the November meeting. The headquarters of this Society has been transferred to Argoway, Parkhurst Road, Bexhill, where a film show was held on 4th December to wind up the year's programme.

RECENTLY the **Kingston and District A.S.** held its election of officers for 1959, and the list remains as before. Other recent activities recently have included a third inter-club table show with Clapham A.S., and this time Kingston lost by 8271 pts. to 825 pts. Speakers during November were Mr. Howe on Livebearers, and Mr. Hartley, of the Salmon Fisheries Board, who spoke on Salmon.

AT the November meeting of the **Erith and District Aquarists' Society**, members listened to the chairman, Mr. E. Coucher, on "Purchased Aquaria." Mr. K. Haller's Texas cichlid took first award from a class of 14 "best" fish. The breeders show was also well supported. Results:—Coldwater: shubunkins (K. Haller); Livebearers: guppies (G. Baker); Egglayers: whiteclouds (C. Ruffles).

MR. CRAIG BARNETT, a pathological-laboratory technician, provided two talks at the **Brookley and District Breeders' Circle** meetings during November—"Investigating Fish and Keeping Records," during the course of which he showed the results of tests and experiments he had carried out on fish and water. These talks were designed to follow-up a visit made by Brookley members to the laboratory that is Mr. Barnett's "workshop." Other talks during the month dealt with Filtration and Aeration, Glazing Tanks and Hatcheries. Some members also made visits to places of interest and outside lectures.

The December programme included an "At Home," two table shows, two lectures, two outside lectures and a visit—and to ensure that the programme is reasonably "full," most members have joined a Natural History Society—making a total of 12 occasions when members gathered together to discuss fish and allied interests.

The group now numbers four "marine types" among its ranks, keeping common and not-so-common rockpool creatures and fish—quite a high concentration for an inland club, no doubt.

Secretary, H. J. Vosper, of 7, Foxberry Road, Brookley, S.E.4, would welcome correspondence from aquarists who have, successfully or unsuccessfully, bred Kuhli loach.

THE results of the Open Show of the **Blackburn and District Aquarists' Society** were as follows:—Goldfish and Shubunkins: 1, Mr. Baxter; 2, Mr. Howarth; 3, Mr. Walsh. Fancy Goldfish: 1, Mr. Howarth; 2 and 3, Mr. Walsh. Livebearers (Swordtails): 1, Mr. Ince; 2, Mr. J. Howarth; 3, Mr. Grumbshaw. Section "B" (platys): 1, Mr. Talbot; 2, Mr. Farran; 3, Mr. J. Howarth. Medals: 1, Mr. Farran; 2, Mr. Talbot; 3, Mr. Simmonds. Guppies: 1, Mr. Heineboch; 2, Mr. Peters; 3, Mr. Simmonds. Characins: 1, Mr. Done; 2, Mrs. Thompson; 3, Mr. J. Howarth. Siamose fighter: 1, Mr. Omerod; 2, Mr. C. H.

Whitsey; 3, Mr. J. Howarth. Minnows and Barbs: 1, Mr. Farran; 2, Mr. C. H. Whitsey; 3, Mr. Morgan. Cichlids (dwarf cichlid): 1, Mr. Ince; 2, Mr. Done; 3, Mr. Crook. A.O.V. Cichlid: 1, Mr. C. H. Whitsey; 2, Mr. Talbot; 3, Mr. Ashworth.

The President's Trophy for best fish in show was won by Mr. Ince, and the G. Smith Plaque for member of Blackburn and District Aquarists' Society with most points, by Mr. Farran. The C. H. Whitsey Medal for member with most points but not being in first three in any class was won by Mr. G. Smith.

### GOLDFISH SOCIETY OF GREAT BRITAIN

MR. D. CLUSE, acting as chairman of the Convention, opened the meeting by extending a warm welcome to visitors and members. He then introduced the lecture to be given by Capt. L. C. Betts, M.B.E., which dealt with the principles of coldwater fishkeeping for the aquarist wishing to keep goldfish for decorative purposes.

Capt. Betts advised the meeting of the basic principles needed to keep these fish healthy and dealt with size of tanks, fish, best types of compost and plants required.

The subject of the next lecturer, Mr. R. E. Ison, B.Sc., was "Flukes." He gave a detailed description of them and their method of reproduction and finally the best way to disinfect fish to ensure that they were free of this parasite.

After questions, Capt. Betts was called on to judge the open class of Singletail Goldfish, the results being as follows: 1, Mr. S. Freeman (shubunkins), 87 pts.; 2, Miss D. Morris (metallic), 86 pts.; 3, Miss D. Morris (shubunkin), 83 pts.; 4, Miss D. Morris (shubunkin), 79 pts.

In his comments on the fishes, Capt. Betts remarked that the standard of the fishes was very good, and to his recollection 87 points was the highest position he had ever given to a singletail fish. Mrs. R. J. Affleck, wife of the president of the G.S.G.B., presented the cups and award cards to the winners.

Mr. R. J. Affleck, M.Sc., president of the Goldfish Society of Great Britain, gave a short talk on the aims of the Society. His views of the fish on show were that they were the best he had seen on show anywhere in the United Kingdom. He also mentioned that members of the G.S.G.B. were persevering with breeding to the Society's standards, and results were now beginning to show. Aquarists interested in breeding quality fish should join the Society in view of the facilities and advice which was available to all members.

At a later meeting an interesting film on Chinese goldfish was shown. It was announced that the new chairman is Mr. M. D. Cluse, and that the new secretary is Mr. W. L. Wilson of 57, Constable Gardens, Edgware, Middlesex, to whom all enquiries regarding the Goldfish Society should be sent. The next quarterly meeting will be held at Friends House, Foston Road, London, N.W.1, at 3 p.m. on 7th March. Those interested in specialising in goldfish keeping are invited to attend.

THE results of the **Bath A.S.** annual show were as follows:

Club Furnished Aquaria (Sydney Cup): 1, Bath A.S.; 2, Bristol T.F.C.; 3, Bristol A.S. Individual Tropical Aquaria (Gurney Cup): 1, Mrs. I. Stone (Bristol); 2, L. Challenger (Bath). Male Guppy—Longtail: 1, R. Bryant (Bristol); 2, J. R. Somers (Bristol); 3, Miss M. Hill (Hereford). Male Guppy—Short-tail: 1, Hill (Hereford); 2, R. Vincent (Keystonum). Female Guppy: 1 and 2, R. Bryant; 3, J. Wheeler (Bath). Swordtails: 1, 2 and 3, L. Littleton (Bristol). Platies: 1, R. Mears (Bath); 2, L. R. Somers; 3, J. Wheeler. A.O.V. Livebearer: 1, R. Vince; 2, G. Stone (Bristol). Barbs: 1, G. Stone; 2, H. Ashton (Yeovil); 3, H. Webb (Hereford). Labyrinth: 1, 2 and 3, H. Webb (Hereford). Characins: 1, 2 and 3, H. Webb (Hereford). Cichlids: 1, 2 and 3, H. Webb (Hereford). Catfish: 1 and 2, H. Webb; 3, Mrs. Hickling. A.O.V. Tropical: 1, H. Webb; 2, Miss M. Hill; 3, J. Wheeler. Breeder's Livebearers: 1, L. R. Somers; 2, J. Wheeler; 3, H. Webb. Breeder's Egglayers: 1 and 3, H. Webb; 2, Mrs. Hickling. Common Goldfish: 1, H. Ashton; 2, L. Smith (Midsomer Norton); 3, H. Jago (Bristol). Five-inch Bristol Shubunkins: 1, W. Hicks (Bristol); 2, W. Burns (Bideford); 3, R. Oxenham (Bristol). Three-inch Bristol Shubunkins: 1, R. Oxenham; 2, D. Piddfield (Shepton Mallet); 3, L. Emery (Bath). Scaled Fantails: 1 and 2, G. Harper (Bristol); 3, V. Capaldi (Bristol). Calico Fantails: 1 and 3, P. Simmons (Bath); 2, G. Harper. Veiltails: 1, L. Smith; 2, W. Burns; 3, V. Capaldi. Moors: 1, V. Capaldi; 2, G. Harper; 3, L. Smith. A.O.V. Exotic Goldfish: 1 and 2, R. Smith (Bristol); 3, V. Capaldi. A.O.V. Aquarium Pond Fish (3 in.): 1 and 2, G. Harper. A.O.V. Aquarium Pond Fish (over 3 in.): 1, R. Bryant; 2 and 3, P. Simmons. Breeder's Bristol Shubunkins: 1 and 2, R. Savage; 3, L. Emery. Breeder's Fancy Goldfish: 1, L. Smith; 2, R. Savage. Breeder's Fancy Goldfish (1 fish): 1, L. Smith; 2, G. Harper; 3, R. Savage. Aquarium Plants: 1 and 3, L. Challenger; 2, J. Wheeler. Trophies—Members' Trophy (best Tropical)—Gurney Cup: H. Webb; Primo Cup (best Goldwater); Bath A.S. Cup—Moore Cup: G. Harper; Champion Breeders' Cup: Mrs. Hickling; Gurney Livebearer Cup: L. R. Somers; Moore Cichlid Cup: G. Stone; Gardner Trophy: R. Savage; Hindson Guppy Cup: R. Vince; Hindson A.O.V. Coldwater Fish Cup: L. Smith; Harper Cup: E. Ashton; Moorimer Cup: R. Oxenham.



### The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. 6d. together with the Aquarist's Badge Token cut from page 211, to Aquarist's Badge, *The Aquarist*, The Buns, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

AT the annual general meeting of **Northampton and District Aquarists' Society**, J. A. Catterall and N. B. Lyon were re-elected secretary and treasurer, respectively. Other officers elected were: Vice-president, Mr. W. H. Smedley; chairman, Mr. S. J. Horlock; vice-chairman, Mr. L. W. Roy; Committee: Messrs. G. Pulley, H. Platt, J. Wright and H. Malpas. A film show was given by Mr. L. W. Roy.

**FUTURE** meetings of the **Paignton Aquarists' Society** will be held at the Oldenburg Hotel, Winner Street, Paignton, on the second and fourth Tuesday in every month, and not in the zoo restaurant. Membership has now increased, and all who are interested should contact the hon. secretary, H. N. Allies at Paignton Zoo, Devon.

**CHANGES** of officials at the last annual general meeting of **Hendon and District Aquatic Society** were as follows: The new chairman is Mr. B. Calrow, and the new show secretary is Mr. A. Stevens, 2, Dallas Road, Hendon, N.W.4. Mrs. B. Robertson, Buck Cottage, 45, Buck Lane, London, N.W.9, remains as hon. secretary.

**THE** annual general meeting of **Dudley and District Aquarist Society** was held recently and officers elected were: Mr. D. Fleetwood, chairman; Mr. H. Walker, vice-chairman; Mr. H. Proctor, hon. secretary; Mr. B. Davies, hon. treasurer; Mr. J. Hancock, hon. show secretary; and Mr. D. Jackson, hon. librarian.

Meetings are held on the second Wednesday in each month at The Three Crowns, High Street, Dudley, and visitors are always welcome. Various table shows and lectures were held during the year, with cups and plaques being awarded. At the annual dinner members and friends attended and enjoyed, amongst other things, a film show, including "Facts about Fish," "Deep Sea Adventure" and "The Catch of the Season."

**RESULTS** of the **North West London Group of Aquarists' Societies'** December contest were as follows:

Platys: 1, H. Trant (Arnold); 2 and 3, Mr. Prince (Wilkesden); 4, Mrs. B. Robertson (Hendon). A.O.V. Tropical Cichlid: 1, E. R. S. Landas (Wilkesden); 2, G. Richardson (Hendon); 3, H. Walters (Independent); 4, H. Trant (Arnold). Coldwater Breeders: 1, G. King (Hendon); 2, W. Wilson (Harrow); 3 and 4, R. Eison (Wilkesden). Tropical Breeders: 1, A. Farnside (Wilkesden); 2, A. Peppitt (Arnold); 3, L. Dare (Independent); 4, L. Harrison (Harrow). Total points to date are: Wilkesden 73, Hendon 55, Independent 40, Arnold 25, Hampstead 16, Harrow 14.

"MARINE Life and Aquaria" was the title of the unusual lecture given by Mr. M. Pugh-Thomas of Manchester University to **Birkenhead and District Aquarium and Herpetological Society**. This was well illustrated by colour slides. At the second meeting Mr. Colin Davies, a society member, spoke on Reptiles and Amphibia.

#### NEW DUBLIN SOCIETY

A NEW Society has been formed in Dublin. At the inaugural meeting it was decided that the title of the club should be the **Irish Aquarium Society**. The hon. secretary is Miss Dorothy O'Byrne, Lourina, 13, Lower Kimmage Road, Dublin. The objects are to increase the general interest and study and also to further showing and exhibiting.

**THE** tropical fishes and other livestock at Holloway Prison are in the care of **Independent Aquarists'** member Miss R. Stevens, who also grows orchids there. In addition to her normal prison duties she is horticultural instructress to the inmates.

Members of the Society will be in attendance at The Daily Express Furniture Exhibition at Paris Court, daily from 28th January to 7th February, to answer questions from the general public.

**THE** officers elected at the **Hounslow and District Aquarist Society's** annual general meeting were as follows: Chairman, Mr. Stallord; secretary, Mr. Worms; treasurer, Mr. Luff; show secretary, Mr. Cleaver; librarian, Mr. Poole; publicity secretary, Mr. Boulst. An increase in members during the year and larger attendance at meetings was reported by the chairman. At an early December meeting Mr. Worms won first award in a show for livebearers with a fine red swordtail, Miss Carter was second and third with a wagtail sword and a black mollie.

**RECENT** activities of the **Ilford and District Aquarists' and Pondkeepers' Society** have included a lecture by Mr. Arnold on the production of micro worm and white worm cultures. Table shows and a quiz have also been arranged. Anyone interested in the hobby will be welcomed at the meetings and further details regarding the Society may be obtained from the secretary, Mr. V. Price, 1a, Horace Road, Barkingside, Ilford.

**THE** winter session of the **Inverness and District Aquarist Society** is well under way. The programme consists of film and table shows and lectures. A recent talk was given by Mr. P. Greening, president of the **Dumfries Aquarist Society**, on the labyrinth fishes with particular reference to breeding fighters for exhibition. The hon. secretary of the Inverness Society is Mr. J. A. F. Bain, 52, Dumain Road, Inverness.

**THE** P.B.A.S. chairman, Mr. S. W. Atkins, recently presented the year's trophies at an informal meeting of the **Friends Aquarist Society**. The plaque for the "Highest pointed fish of the year" was won by B. Scutts with a dwarf gourami and J. Horne won the Club Championship Plaque. New members would be welcome and are invited to contact the hon. secretary, who is Mr. E. H. Barfoot, 378, Grove Road, Mitcham, Surrey. Tel: Mitcham 3839.

**THE** speaker at the last meeting of the **Bradford and District Aquarists' Society** was Mr. G. Taylor the club president, and his talk was on line breeding. The Table Show Cup and second-half plaque has been won by Mr. C. Wilson. The annual meeting has been fixed for 7th January.

**AT** the **Scottish Aquarium Society** annual show the standard of fish shown was good and altogether some 250 tanks were on view, 50 of these being coldwater. The results were as follows:

Special awards—The Beltrous Shield for best fish in the show, blue acara, R. Christie. The Peter McNish Trophy for best exhibit in the Tropical section, blue acara, R. Christie. The Robin Kerr Trophy for best exhibit in the Coldwater section, shubunkin, Mr. J. H. Hood and Miss H. R. Gibson. Breeders' Trophy, Shubunkins, Mr. J. H. Hood and Miss H. R. Gibson; The Smith Trophy, Breeders, Pighsers, A. Watt; S.A.S. Inter-Club Trophy, Edinburgh Aquarist Society; S.A.S. Furnished Aquarium Trophy for best furnished aquarium set up by an individual member, D. M. Button; The Sowers Cup for best furnished aquarium set up by a school, Bellshouston Academy; Strachen Kerr Trophy for best furnished coldwater tank set up by a junior or juvenile member, Ronald Reid; The Water Life Cup for best exhibit by a junior or juvenile, Ronald Reid; The President's Prize for best common goldfish exhibited by a member, Greenock and District Aquarium Society.

Common and Comet Goldfish: 1, Greenock and District Aquarium Society; 2, R. A. M. Robertson; 3, J. Duncan. Shubunkin: 1, 2 and 3, J. H. Hood and Miss H. R. Gibson. Fantail and Veiltail: 1, J. H. Hood and Miss H. R. Gibson; 2, A. Young. A.O.V. Goldfish: 1, A. Heron; 2, K. A. M. Robertson. A.O.V. Coldwater Fish: 1 and 2, D. Button; 3, W. Reid. Pair of Guppies: 1, E. Readings; 2, A. Robertson; 3, H. Kerr. Pair of Swordtails: 1, Greenock and District Aquarium Society; 2, D. McAra; 3, H. Kerr. Pair of Platys: 1, A. Cross; 2, Greenock and District Aquarium

Society; 3, A. Watt. Pair of Mollies: 1, Greenock and District Aquarium Society; 2, H. Kerr; 3, R. Wood. Pair A.O.V. Livebearers: 1, S. Naimish. Pair of Danios: 1, J. D. Low; 2, G. Reid; 3, A. Cross. Pair of Characins: 1, W. Bissett; 2, E. Seymour; 3, W. Bissett. Pair of Barbis: 1, G. Reid; 2, Greenock and District Aquarium Society; 3, W. S. Bissett. Pair A.O.V. Small Egglayers: 1, A. Watt; 2, H. Kerr; 3, G. Dalrymple. Large Cichlid: 1, R. Christie; 2, G. Reid; 3, A. Cross. Angel Fish or Pompadour: 1, W. S. Bissett; 2, G. P. Magree. A.O.V. Large Egglayer: 1, 2 and 3, G. Dalrymple. Pair of Fighters: 1, Greenock and District Aquarium Society; Pair of Gouramies: 1, A. Cross; 2, A. Watt; 3, G. Reid. Breeders Coldwater: 1 and 2, J. H. Hood and Miss H. R. Gibson. Six Breeders Tropical: Livebearers—1, H. Kerr; 2, W. Bissett; 3, A. Ramsay. Egglayers—1, W. Bissett; 2, E. R. McDonald; 3, A. Watt. Furnished Coldwater Aquarium: 1, J. McIlwan; 2, A. Young. Furnished Tropical Aquarium: 1, D. Button; 2, J. B. Mureay. Furnished Tropical Aquarium set up by a junior or juvenile member: 1, H. Partridge; 2, R. Louf. Furnished Coldwater Aquarium set up by a junior or juvenile member: 1, Ronald Reid; 2, A. Young, Jun.; 3, R. Love. Furnished Aquarium set up by a school team: 1, Bellshouston Secondary School; 2, Bannockburn J.S. School; 3, Strathbungo S.S. School. Furnished Coldwater Aquarium set up by a club team: 1 and 2, Greenock and District Aquarium Society; 3, South Glasgow Aquarium Society. Furnished Tropical Aquarium set up by a club team: 1, Edinburgh Aquarists' Society; 2, Rolls Royce (Glasgow) Aquarium Club; 3, Greenock and District Aquarium Society. A.O.V. Reptile or Amphibian: 1 and 2, D. Button; 3, J. H. Hood and Miss H. R. Gibson.

**AT** the last **Bristol Aquarist Society** meeting Mr. L. G. Emery spoke on coloration of calico goldfish, the cell structure, and how to get better colours in our nacreous fish. The coldwater table show competing for the S. J. Davis Trophy for highest points scored by any member was won by Mr. G. Stone, a tropical member, with 27 points, the highest since 1952.

#### CHANGE OF ADDRESS

**THE** new address of Mrs. B. Robertson, secretary of Hendon and District A.S., is 45, Buck Lane, Kingsbury, London, N.W.9.

#### SECRETARY CHANGE

**A** CHANGE of secretary is reported from Thurrock Aquarist Club (U. H. Ilford, 38, Derry Avenue, South Ockendon, Essex).

### Crossword Solution

A	L	I	S	M	A	N	A	T	A	N	S
G	A	D	A	O	A	R	S	U			
A	C	E	R	I	N	A	I	T	E	M	
M	E	A	L	P	H	A	B	E	T		
O	F	I	C	C	U	R	S				
G	R	I	L	L	P	E	T	I	T	E	
E	O	N	I	C	I	A	A	D			
N	E	S	T	M	A	K	E	R	S	I	
E	A	P	S	E	Y	C	M				
S	E	D	G	E	S	E	V	I	E		
I	E	S	T	I	M	A	T	I	O	N	
S	H	E	S	A	T	U	R	A	N	T	

#### PICK YOUR ANSWER (Solutions)

1 (B), 2 (B), 3 (D), 4 (A), 5 (C), 6 (C)