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and Pondkeeper

FEBRUARY 1964



MONTHLY  
Vol. XXVIII No. 11

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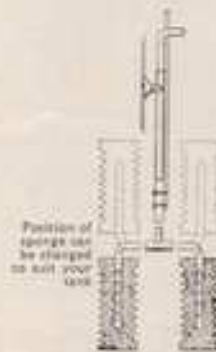
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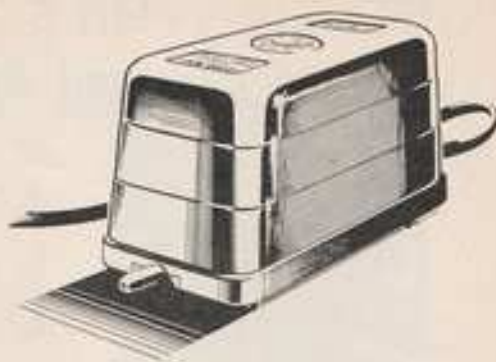
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# The AQUARIST AND PONDKEEPER

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## Life - Expectation and Feeding

WHAT is the effect of underfeeding of young fish on their growth and on the age and size that they can ultimately reach? Does dietary restriction in the early stages of a fish's life prevent the attainment of sexual maturity? To these questions most aquarists would think they could give definite answers, but from recently published results of laboratory studies of these matters it emerges that some popularly held notions are not correct.

Dr. Alex Comfort, a zoologist of University College London, has used the guppy to study problems of animals' growth and ageing for many years, and several of his interesting findings have been reported in *The Aquarist* from time to time. His latest results have been published in the scientific journal *Gerontologia*, and they are of particular interest to aquarists.

Dr. Comfort has compared the life-spans of groups of female guppies taken from the same brood and kept under identical conditions with the exception that one set was fed weekly and the other one fortnightly. At 600 days of age the underfed fish were also put on the weekly feeding routine. Accurate assessment of the observations made up to and after this age revealed that before 700 days of age both sets of fish showed a similar mortality, whereas after 700 days the well-fed set began to die off; the fish that had been underfed did not do so until a further 200 to 250 days. Also, the fish that had been underfed reached similar sizes to those of the other set at the time of death. In other words, the amount of feeding for maximum expectation of life in the guppy is lower than that required for rapid growth. This does in fact agree with results obtained in similar studies made with other animals as diverse as rats and cockroaches.

The experiment took nearly 5 years for all the results to be obtained, and Dr. Comfort records that one of his female guppies lived just under 6 years. He also notes that retarding the guppy by underfeeding does not prevent maturity being reached, although it delays its onset, and the mature underfed fish are of small size. This is a finding different from that with underfed young rats, which remain "chronically immature".



# A Mediterranean Aquarium

by D. W. SANDERSON

Photographs by K. NEWMAN

**B**EFORE coming to Cyprus to take up a teaching appointment in an Army Children's School in 1961 my only experience as an aquarist was the keeping of a few goldfish in a garden pond made from half a barrel. It was my first glimpse below the surface of the blue Mediterranean that planted a 'germ' which has since grown into the 'bug' by which I have been well and truly bitten. I may not be the world's most experienced aquarist, but at least I may claim to be one of the keenest. Who else would endure the following adventures undaunted?

Once I had made up my mind that I was going to keep the colourful denizens of the Mediterranean in my own home nothing could sway me from my purpose. The first requirement was obvious. A tank of some sort must be acquired from somewhere. My search in the local shops was a very short one. The Middle East is not overpopulated by pet shops, and Cyprus is no exception. There was only one aquarium for sale in the whole of Famagusta. It was designed to accommodate a maximum number of potted plants and a minimum number of fishes. As I had no desire to 'rob' the shopkeeper by paying the mere 7 pounds he had come down to after half an hour's bartering, I departed under a cloud of gloom.

However, I did not remain gloomy for long: I remembered a Cypriot friend who made metal furniture. If he could make chairs and tables surely he could make an aquarium and stand. I ran him to earth in a local coffee shop where he was resting from his labours and gaining strength to drive his van back to the works. Could he make an aquarium? He could, and he did!

The aquarium was a magnificent affair 33 in. by 16 in. by 15 in. (give or take half an inch here and there) on a tubular steel stand which had three long legs and a short one. The latter problem was easily solved. With the



The D-shaped net is baited with fresh live food by the aqua-lung diver, whose fish carrying jar is seen floating to his left.

aid of a spirit level, and 5 piastres under one leg and 3 under another, I managed to get it level.

All I had to do now was glaze it and fill it. After buying the glass I began to think that the glorified plant-holder might not have been such a bad bargain after all. Along with the glass I purchased some putty and a tin of anti-corrosive paint. The shopkeeper assured me that neither of them could possibly harm my fishes. The fishes did not share his optimism and proved it by exploding one by one. However, this was not discovered until later when



A broken sea urchin in the net soon attracts some blacktails, rainbow wrasse and reef fish.



In a closer view of the baited net adult (banded) and juvenile rainbow wrasse are seen feeding.

all the other faults which caused them to die much quicker had been eliminated.

I was unable to find any glass thicker than  $\frac{1}{2}$  in. plate and was hoping for the best after calculating that my tank would hold 28 gallons. Twenty stones seemed a lot of water to be standing on  $\frac{1}{2}$  in. of glass. However, I set to work optimistically with putty and glass, but soon found that I was the unintentional possessor of a bow-fronted aquarium! The front was slightly bowed inwards and when I pressed one end of the glass firmly into the putty the other end sprang out. For a few minutes I played 'saws', pressing each end in turn. Finally I solved the problem by putting one end piece in place, and then pushing in the other end piece with one hand while gingerly tending the front piece with the other. It worked! The glass was not only in, but in tightly. There were none of those bare expanses of putty on the inside which my aquarium handbook said must be avoided at all costs.

The handbook, which dwelt extensively on the making of a home aquarium, dismissed marine aquaria and the inhabitants of the sea in a page and a half. But one thing the handbook stressed—all putty and metal exposed to the sea water must be coated with anti-corrosive paint! Full of faith in the printed word I went ahead and coated it. The paint was bright silver and it shone brilliantly in the sunshine. I had not intended to paint the outside with anti-corrosive paint, but apparently it only comes in half-gallon tins at fabulous prices, so not wishing to waste it I painted the whole thing bright silver.

It looked very effective! At this point, however, a nagging doubt entered my mind. Was it really harmless? Did the shopkeeper know what was poisonous to fishes? Did he care? I consulted the label on the tin. It was in Dutch!

I dismissed such thoughts from my mind. I was eager to get the tank set up, and as soon as the paint was properly dry I put about 3 in. of beach sand in the bottom. The next task was the transporting of the water. We lived only a few hundred yards from the beach so this was no great problem. One dark night I assembled three buckets, two large pans and a watering can and loaded them into the boot of the car. I drove down to the beach and, glancing furtively around, I unloaded them on to the sand. A few passers-by watched in idle curiosity. Their curiosity deepened as I started to transfer water from the sea to the boot of the car. Backwards and forwards I staggered across the sand with buckets, pans and watering can.



The voracious scribe perch (*Serranus scriba*) will eat any fish smaller than itself but is a hardy aquarium species if kept with companions of similar size.



Soldier fish (*Halocentrus ruber*) in the sea, swimming around the anchor chain of a large buoy.

"I'm taking the sea away!" I cackled hysterically. The watchers passed hurriedly on.

Four journeys later the tank was full, and mercifully it didn't leak! I looked upon it with pride. I had managed to keep the water clear by putting newspaper inside the tank and pouring into a flat dish.

However magnificent a silver tank full of sea water may look, it is considerably improved by the addition of rocks and weeds. I was lucky enough to find some small pieces of rock covered with bright orange, red and green algae. They were also prettily shaped and had a few small weeds growing on them. These rocks and some handfuls of 'sea grass' formed the decoration for my tank. The result was very satisfying.

#### Disaster

I had ordered an air pump and filter from England a week before, but they had not arrived by the time I was ready to set up the tank. Thinking that the sea water would be all right on its own for a few days I had gone ahead. The scraper would arrive any day and all I needed now were some fishes; so armed with a home-made net I took the family for a day out at a remote rocky bay. The pools teemed with life. Little gobies and blennies lay motionless in the sun, just waiting to be caught. Beautiful rainbow wrasse darted everywhere. Everywhere, that is, except into my net. Even the apparently sluggish gobies and blennies showed a surprising turn of speed as they disappeared into inaccessible cracks in the rocks. At the end of the day I had caught half a dozen tiny prawns and sunburn! The former were placed in the tank, and after washing them for a few minutes I went wearily to bed.

Next morning when I awoke, an odd odour assailed my nostrils. At first I couldn't place it. Perhaps next door were emptying their cess-pool again. They always chose a Sunday morning to do it. I looked out of the window. No; it wasn't that! My wife, who has a super-sensitive nose with apparent direction-finding properties, decided that the smell was coming from the hall. Knowing that she is usually right in such matters, I went to investigate.

The scene in the hall where the aquarium stood was one which my eyes and certainly my nose will never forget.

During the night the base of the tank had split from end to end, and the floor was a miniature lake. This was not the worst part of the catastrophe by any means. The tank was still half full of evil-smelling water. Words cannot describe that smell. A friend told me that he once saw a hardy old fisherman be sick at the smell of a sackful



of starfish which he had removed from his oyster beds and forgotten for a few days. The snail in my tank must have been very similar. However, the water had to be removed, so I set to work to bail it out. I kept my head below the level of the tank, for so put it over the top would have had an immediate and disastrous effect. Several times I had to go outside and take deep breaths of fresh air. When it was all over I lay on my bed and stayed there for the rest of the day. It was weeks before I could eat fish again.

Eventually the air pump and filter arrived and I decided to start again. I had two pieces of angle iron welded across the base of the tank, and these took the weight of the water without trouble. I replaced the base glass without removing the ends and sides. This meant that it was smaller than the original, which had been put in before the sides, and there were one or two of those bare expanses of putty which I knew should have been avoided. Later I was to wish that they had been, for when the tank was full, water began to drip from every corner and several places in between. For half the night I fought a losing battle against the leaks. I was wet and stiff from lying on my back on the floor, which was the only position from which the leaks could be seen. In desperation I consulted my handbook to see if it offered any advice. I looked up 'leaks' and found that I was advised to return my tank to the maker as its construction was obviously faulty!



Paintings by the author of (left) the young and (right) the adult rainbow wrasse (*Thalassoma pavo*)

Eventually the leaks were beaten by using a 'plug' of toilet paper quickly covered with putty and then painted with nail varnish, which dried quickly and prevented the water from seeping through.

#### Home-made Filter

The aerator and filter did not solve all the problems as I had hoped they would. The filter was of the internal corner type and proved too small for the job. For a while I used a home-made external filter. This was a milk bottle containing charcoal and glass wool, with a siphon tube to take water from the tank and an air-lift to take the clean water back. This was an improvement but the sand still went black and eventually polluted the water. By this time I was a familiar figure on Famagusta beach on moonlight nights carrying buckets and cans of sea water to my car. The boot of the car was also beginning to suffer, so I used up the rest of the anti-corrosive paint on it. I now have the only car in Cyprus with a silver boot.

I reduced the sand in the tank to a bare covering, which prevented it from turning black. I was painstakingly careful about the cleanliness of the tank but still the water would gradually turn white and opaque, and would have to be changed. I realised that only the putty, the paint (most of which had peeled off by now) or the metal frame itself could be poisoning the water. There was no way out, except to start again from scratch. It was the end of

the summer of 1962, and the sea was becoming too cold for fishing, so I decided to pack up until the following year. With a whole summer's experience behind me I was an accomplished fisherman and there was never any shortage of fishes for the tank. The problem was to keep them alive once they were caught.

#### Second Start

Easter 1963 found me ready to start again. The failure of the previous year had taught me a lot, and I was confident of success at last. However, the start was not encouraging. I broke the first piece of new glass as I was putting it in. I returned to the shop immediately and bought another sheet. Arriving home, I put it down against the fence and instantly a puff of wind blew it over. Back to the shop I went, where the shopkeeper smirked happily as he wrapped the third sheet of glass. He had done very well out of me in the past year.

This time I got the glass home without mishap. I used Bostik sealing compound, which is inert in water, instead of putty. I also coated the top bars of the frame with Bostik so that there would be no metal-water contact, and fitted rubber tubing along the edges of the bars to make a water-returning surface for the drops sprayed on to the cover glass by the aerator.

The thin covering of sand which I had used in the tank

the previous year had had several disadvantages. It was easily disturbed by the fishes or sucked up by the siphon tube, and soon became very patchy. This time I covered the base of the tank with Bostik and while it was still wet sprinkled on clean sand. When the Bostik dried the sand was firmly stuck to it. This proved very satisfactory.

Rocks from the sea and sea weeds are no good, so I used clean rocks, which I also sterilised, and artificial plants. Later I abandoned even the artificial plants as they soon decay and break up in salt water. I bought a new filter which took water from one end of the tank and returned it by way of an air-lift at the other end. This was entirely satisfactory as it could turn over 12 to 14 gallons an hour and also helped to aerate the water. A separate aerator was also necessary to keep the water moving faster. This combination has worked well for the past 6 months and is still going strong.

I caught plenty of fishes in rock pools and by 'sneaking' in shallow water. Most of these fishes were rather shy and given to hiding under rocks for a great deal of the time. An exception was the rainbow wrasse (*Thalassoma pavo*), with its brilliant red, green and blue markings, and the black and white-striped scribe perch (*Serranus scriba*). Occasionally I saw a brilliant red cardinal fish (*Apogon (sberbi)*), glowing like a jewel in a dark hole or underwater cave, but they were beyond the scope of my fishing methods. I used a D-shaped net which I baited with a broken sea



remain and held on the bottom, keeping perfectly still while I waited for the fishes to come. This meant I could only fish in shallow water.

In July I joined the R.A.F. Eastern Cyprus Sub-Aqua Club and my scope was increased immensely. I soon caught several cardinal fish, which, in spite of their shyness in the sea, settled well in my tank, and after a while they stopped hiding under the rocks and swam freely about.

Probably the most spectacular and hardy of the local fishes is the soldier fish (*Molvastrus rubrus*). This fish has bright orange-brown and white stripes on its body and spiny orange and white fins. It has large brown eyes like a toy teddy bear. It spends most of its life in dark holes and is very timid. In spite of this it can become very tame in an aquarium. I have seen which will take food from my fingers. Their hardness was proved when I tried a

chemical preparation for fin rot which killed the other fishes in the tank. The soldier fish turned almost white but after 2 days their stripes returned. They were the only fish to survive the disaster.

I have kept many other aquatic animals including a small octopus and other invertebrates. The interest which they have provided, and the decorative value of a tank of colourful sea fishes in my home, have well repaid my efforts and early troubles.

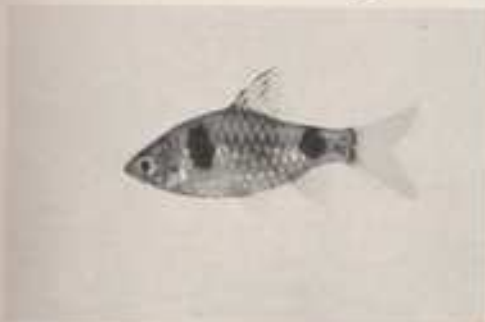
There are no books on Mediterranean fishes in English and very few on marine aquaria, so I have had to seek advice from various other sources. I would particularly like to thank Mr. P. J. Whisthead of the Natural History department of the British Museum for helping me to identify many of my fishes, and the Horniman Museum, London for the practical advice they have given me.

## Breeding Cumming's Barb

(*Barbus cummingi*)

by

KONRAD STEMBROWICZ



*Barbus cummingi*

It is strange how from time to time some species of fishes seem to disappear from the aquarists' tanks for no apparent reason. Since 1955, it has happened to a species of barb most ideally suited to life in a community tank. No matter where one looked, *Barbus cummingi* just were not to be found. Last year, however, some young adults were imported and I, for one, speedily obtained six. Placed in a large, well-planned tank, with soft, slightly acid water, in a matter of a few months they obtained their full size of just over 2 inches and I was pleased to find that I had three pairs. And what a glorious sight they were!

The large scales, sparkling gold, silver and green, outlined by thin black lines, formed a lattice effect, and the jet-black shoulder bar and black spot on caudal peduncle, outlined with pure gold, stood out like markings on a domino. It seems that *Barbus cummingi* have no popular name, at least I have not heard of any. Would I be preposterous to suggest domino barb?

My three pairs, once mature, quickly came to breeding condition, females bulging with roe. They were fed on many different kinds of dry food and *Daphnia*, boiled liver and white worms. I am fortunate to be able to get *Daphnia* and *Cyclops* at any time of the year, within a 5 miles radius of Norwich, and so use it a lot, which certainly helps to get fish in breeding condition.

Now I set up a 24 in. by 12 in. by 8 in. breeding tank. If possible, larger tanks should be used to delay the spreading of the fry to several tanks until they can be handled safely. The tank was filled to a depth of 6 in. with crystal-clear rain water from an old oak water butt. To this was added 2 jam-jars of dark amber peat water. On testing the water was found to have pH 6.6 and hardness was 6 German degrees. The addition of peat water is not really necessary, softness being the important factor, though increased acidity helps to keep down bacteria. I have proved to myself time and time again, that as long as water is clean and soft enough the spawnings of almost all popular species of barbs will hatch successfully.

No sand was used in the breeding tank. For spawning medium I used washed and scalded coconut fibre. I consider it to be far superior to any other spawning medium, including nylon thread or mops. It can be bedded, used and stored until it is needed again. The fibre I arranged in a crescent shape, building it up to the surface and spreading it extra thickly over the heater to prevent the newly hatched fry from burning themselves to death on it, as often happens.

Barbs usually spawn along the fringes of whatever spawning medium they are provided with, and thus the crescent arrangement gives them more area to shed their eggs on. Sometimes I use the fibre arranged in the shape of a bowl, for the same reason. Knowing their appetite for their own eggs, it seems a wise precaution. I placed a few floating ferns over the half of the tank with the fibre

(it seems to give the fish a sense of security), set the temperature at 80°F (27°C) and left the tank to settle. A pair of fish was introduced one evening and they spawned on the morning of the third day, which was bright and sunny.

I took the pair out in the afternoon and observed many eggs, some on the feathery roots of the floating ferns. My next step was to siphon about a third of the water and replace it with matured and harder water. This helps to prevent formation of bacteria from decomposing sperms, which sometimes happens. The fry hatched approximately 36 hours later, and for the next 2 days hung on the side of the tank among the fibre and near the surface under the leaves of the ferns. Very few eggs failed to hatch. Occasionally the fry moved short distances. On the third day they started 'hopping' about, and on the fourth all were free-swimming. Barbs, unlike characins, which stay near the bottom, swim at all levels.

Many aquarists waste a few days feeding with Infusoria, which with fry of any barb of *cammingi* star is unnecessary. I started mine on micro worms for 3 days, changed to brine shrimp for the next 7 and started feeding with very small Cyclops and powder-fine dry food on the tenth day. In the meantime I carefully removed all cocoon fibre.

The little fish seemed to be everywhere. During the third week I spread the fry to five already prepared 36 in. by 15 in. by 12 in. tanks. I counted them as I transferred them in a fine nylon net, and was very surprised and pleased to find I had 520 little fish. They are 10 weeks old now and average an inch long.

They are a splendid little fish, my 'domino barbs', and I hope that many more aquarists will enjoy watching them in their tanks.

## A Simple Method of Keeping Rust at Bay

A SIMPLE and easy way of preventing the top frames of aquaria from deterioration by rust caused by condensation is to fix a layer of plastic strip along the top edges.

Materials required: a small tin of priming paint (preferably aluminium); some strips of 3½ to 3 in. plastic sheeting (black polythene as used by gardeners, contact adhesive or even heavy plastic fertiliser sacks will do); a tube of heavy duty Bostik adhesive.

First remove all loose rust and thoroughly clean the top edges of the tank. Next apply a coat of priming paint and let this dry for a day or so. Now cut the strips of plastic to the length and width of the tank: i.e. two strips for back and front and two for the sides. Then apply the Bostik adhesive to top edge and under the rim. Apply the adhesive sparingly to the plastic strips on one side (spread it by using a bit of cardboard or cellophane) and leave to dry for 15 minutes or so. Next take the strip of plastic and place it on the top of the tank so that about ¼-1 in. can be folded over the edge and pressed under the rim. Press it down well and smooth out wrinkles. Any surplus hanging over the outside edges can be trimmed with scissors.

When this has dried, paint the top with a good-quality paint. If needed, thin rubber strips for the cover can be stuck on in the same manner.

G. W. Hardwick

## The Three-Striped Glass Catfish

by

JACK HEMS

THIS slim-bodied catfish from the Stanley Pool region of the Congo, from whence it was first introduced to tropical aquarists about 10 years ago, attracts immediate attention by its striking appearance and unusual ways. For unlike most catfishes we know, it does not live on the bottom, but spends its time darting here and there, or hovering, with a rapidly vibrating tail, in the middle or upper layers of the water, which, to suit it, should be of a softish neutral to slightly acid quality maintained at a temperature around 75°F (23°C), though a variation of a few degrees either way does no harm.

It is a peaceful species, but rather timid and therefore should not be placed in a sparsely-planted community tank housing boisterous or too curious fishes, which will worry it. Another thing, it is one of those species which languishes without the company of its own kind. So two or more should always be kept together.



Three-striped glass catfish (*Etrapielus debauwi*)

To keep it well nourished, live *Daphnia*, or small red or white worms, dispensed from a perforated feeder are recommended. However, in spite of its carnivorous inclinations, some of the flakey dried foods are snapped up with evident relish.

The general appearance is translucent silver tinging down to pearly white on the belly. Adorning the sides are three blackish stripes, the middle one of which terminates at the fork of the dusky-lobed caudal fin. The anal fin starts from a point about halfway along the underside of the body and extends as far as the tail. The tiny dorsal fin, situated near the head, and the pectoral fins, are each provided with a strong anterior spine; the ventral fins are small. There is an adipose fin where the ridge of the back dips towards the caudal peduncle; and three pairs of scarcely noticeable barbels bristle on the mouth. The sexes are hard to tell apart, except by the fuller body of the female and the sometimes brighter hues of the male. It reaches a length of about 3 in.

Thankfully, *E. debauwi* has been given the popular name of three-striped glass catfish. Up till the time of writing it has not bred in captivity.

# A Small Barb with a Long Name

by MIKE THOMAS

**S**TOLICZKA'S barb (*Barbus stoliczkanus*, or *Barbus stoliczkae* as it has incorrectly been called) was first described as a separate species by Sir Francis Day in 1871. Ever since then there has been a great deal of discussion and argument as to whether it is actually a distinct species or only a sub-species of the better-known *Barbus ticto* (Hamilton-Buchanan, 1822).

When one compares the facts it does appear that the species are different, but very closely related. I believe so closely related that they can easily interbreed. It has the typical barb shape of body, similar to the rosy barb, and lacks barbels. The basic colouring is silver but has a pinkish tinge, especially in breeding condition. The scales are larger than in *Barbus ticto* and are edged with black. There is a black spot with a golden 'halo' at the caudal peduncle, which is found in *Barbus ticto* as well, but there is a largish black blotch or bar behind the operculum which in *Barbus ticto* is only a spot. The dorsal fin of the male fish is the easiest and quickest way of differentiating between the two species: *Barbus ticto* has a red dorsal with a black edging and a small bar halfway down, whereas *Barbus stoliczkanus* has the first ray jet-black and edged with black on the top, but has the basic deep red colour interrupted in the middle with black streaks.

Different books quote different habitats, although the majority tend to favour Burma and Thailand, with *Barbus ticto* also coming from India and Ceylon. The question of the lateral line is also confusing, although many agree that *Barbus stoliczkanus* has a complete line, *Barbus ticto* having an incomplete one.

*Barbus stoliczkanus* is a smaller fish, only growing to about 6 cm., whereas *Barbus ticto* is about 10 cm. It is



Foto:

A. van der Nieuwenhuizen

Probably a sub-species of *Barbus ticto*, the Stoliczka's barb is also known as *Barbus ticto stoliczkae*.

easily bred in the typical barb fashion, needing no special requirements. The young grow rapidly until about 2 cm. long, then they seem to stop for about 4 weeks and then shoot ahead and grow rapidly once more.

As I said before, I think they can be, and that they are, interbred with *Barbus ticto*, and in this way the distinct markings of both species are ruined. I think that extra care when choosing pairs for spawning must be taken to prevent these two species from becoming indistinguishable.

## FISH AILMENTS

### Digestive Disorder

**A** FISH suffering from constipation shows a complete lack of interest in food and in most cases the abdomen becomes swollen. This swelling will possibly affect the normal working of the swim bladder and therefore some difficulty may be experienced by the fish in maintaining its balance.

The most common cause of constipation can be found in the nature of the food the fishes consume. For example, a diet consisting entirely of white worms (enchytrae) can cause constipation. Mollies (genus *Mollietia*) are particularly prone to this complaint owing to the elongated nature of the gut, which is designed for the digestion of soft vegetable food. It should also be remembered that starchy foods swell after contact with water and may cause either constipation or distension and its allied swim bladder ailments.



Swollen abdomen can be a sign of digestive disorder

Constipation may be treated by feeding the fish with some dried food that has been soaked in medicinal paraffin oil or by adding a solution containing one teaspoonful of Epsom salts (magnesium sulphate) for each Imperial gallon of water in the tank. The effect of the treatment is enhanced if the water temperature is allowed to rise by about 5° to 10° F (3-5° C) and then kept steady until the sufferer is in good health again.

R. E. Macdonald



# Aquarium Goldfish Diet

by A. BOARDER

FOR goldfish in tanks in the house the same types of food as those suggested last month for pond fish can be used, but it is even more important to make sure that too much food is not given at a time. Whereas a little over-feeding may give no bad results in the pond the opposite is the case with indoor tanks. There is no doubt that more fish are lost in tanks by over-feeding than from any other cause. It is not that goldfish will over-eat, but the excess of food they leave will soon go foul and pollute the water.

The very important matters of knowing how much food is given at a time and how often to feed were discussed in a previous article, but it cannot be emphasised too strongly that the temperature of the water is the controlling factor when feeding is considered. Another point to bear in mind is the number and size of the fish in the tank. Naturally, the larger the fish the more they can eat, but if too many fish are kept in a tank it is probable that they will not eat as much. If the water has insufficient oxygen then the occupants will not be able to eat and digest their food as well as when the water is in a healthy state.

There are many packet foods on the market and a little trial and error will soon indicate which foods are eaten best and which are all cleared up by the fish. If only one tank is possessed then there is no doubt that packet food will be better than one mixed by the aquarist, as one usually makes so much that it can become stale before it is all used up. During the summer the fish may be fed with the packet food twice a day, but in the cold weather once in 2 days may be enough. In addition to the packet foods sold for goldfish there are other dried foods that can be given. One of the best is Bemax. This is the dried wheat germ and it contains vitamins essential to the well-being of the fish. There is no need to feed with this food too heavily; it is rather expensive and about twice a week will be enough for most fish. A little rolled oats can be given occasionally and dried shrimp will also be found very beneficial.

To make a good dried food mixture for goldfish in tanks use 1 part of rolled oats, 1 part of dehydrated meat,  $\frac{1}{2}$  part of Bemax or other type of wheat germ and  $\frac{1}{2}$  part of dried shrimp. This should all be put through an ordinary domestic mincer and well mixed. This food should be stored in an air-tight jar and kept in a cool place. It will be found an advantage to sift the food through a fine sieve so that all the dust is removed. This can be dampened and fed to goldfish or kept for fry if necessary.

Do not give any dried bread to fish in tanks; it will foul the water very quickly if not eaten. A feeding ring should always be used in a tank so that any food which is given will remain in one place and not spread all over the tank base. With the use of a ring it will also be possible to see whether the food is eaten quickly or not.

Live foods can be given when available and these will make a welcome change of diet. Garden worms should be broken or cut up before being given and large ones should not be given to small fish. During the spring some frog tadpoles can be added; these are relished by any fish

large enough to swallow them. Toad tadpoles will not be eaten but serve as good scavengers if a few are added to a tank. *Daphnia* and *Tubifex* can be given if one is sure of the purity of their source. I do not use these foods myself, as I consider that there is always the danger of introducing pests and diseases with them.

The live food I prefer to use is white worms (or *enchytraea*). I breed my own in boxes of peat and feed them with dampened brown bread. To catch a quantity of the worms at any time I place a small knob of cheese in a depression in the peat and after 2 or 3 days I can take out with tweezers the large bunches of worms that have congregated round the cheese in their thousands. I have fed goldfish in indoor tanks for 6 months at a stretch on white worms alone and they have not only kept quite healthy but they have grown well. White worms are unlikely to introduce any pests or diseases to a tank as they do not live in water normally, although another advantage of using them is that they remain alive for 48 hours in the water, and probably would not start to decay for at least another 24 hours. I must admit that the tanks where my indoor fish are kept are well established and have plenty of growing vegetation. This condition enables the goldfish to obtain plenty of vegetable matter when they need it.

Another good food may be found in maggots, which are eagerly taken, especially if they are broken first. When feeding *Daphnia* to tank fish it is advisable to examine them carefully in a white bowl first, and to remove any larvae of dragon flies or water beetles, which are often found among them.

For feeding goldfish fry in tanks it is necessary to start with the finest foods such as *Infusoria* and then gradually to increase the size of the food as the fry grow. It is also possible to purchase a very good liquid fry food in water. This is excellent and since trying this food out I have discontinued using cultured *Infusoria* entirely. I found previously that the amount of *Infusoria* present in a culture was very variable and one could not always be sure that the fry were getting enough to eat. However, with the liquid fry food one knows that there is not only food readily available but also that in itself it encourages the formation of *Infusoria* in the tank.

After the fry have grown too large for this type of food they can be fed with micro worms, brine shrimps and mashed white worms. There are good worm shredders on the market which will quickly reduce these worms to a fine pulp suitable for fry. From the age of about 14 days the fry can be given fine dried food; the one recommended above can be put through a coffee grinder and the finest grains, which pass through a nylon-socking sieve, can be given. This dust-like food will float on the surface for some time and so enable the fry to eat it before it falls to the bottom. As the fry grow so the size of the food can be increased and various kinds can be given.

Remember that goldfish will not over-eat, but any uneaten food will spell trouble. The next article in this series will deal with feeding all other kinds of coldwater fishes.

## Breeding *Rasbora heteromorpha* and *Rasbora hengeli*



A good pair of *Rasbora hengeli*, which can be spawned in the same way as *Rasbora heteromorpha*, except that soft water is essential

by A. VAN DEN NIEUWENHUIZEN

*Colour photographs by the author*

**B**OTH *Rasbora heteromorpha* and *Rasbora hengeli* breed in similar ways, but it must be said that *heteromorpha* is easier to breed than *hengeli*. First of all you must be able to select suitable males and females.

With both species it is best to purchase a shoal of the young rasboras, perhaps eight or more. In a tank measuring about 36 in. by 15 in. by 15 in. 16 specimens of each species can be housed. When possible, have no other fishes in this aquarium and plant it well with *Cryptocoryna*. Make the bottom dark with peat pieces, cover the sides and place it in the room where it will receive 12 hours of daylight. If possible locate the tank where it will receive some morning sunshine. If there is excessive daylight you can use floating plants such as *Salvinia*, *Ceratopteris thalictroides cornuta*, *Hyacinth*, etc.

In this tank the rasboras should be fed well. You can give them *Daphnia*, all mosquito larvae, a small amount of *Tubifex* and a small amount of white worms. Very good as food are fruitflies (*Drosophila*), which you can breed and give to all your fishes. When fed every day with this varied diet your rasboras will grow well and as soon as they are about 7 months old you can observe their first spawning attempts.

When you want to breed rasboras you must watch for the first spawnings within the shoal, as you will have the best results with pairs that select themselves. When you have noticed a definite pair remove them from the large aquarium and keep them separately. Such pairs are the foundation for success in spawning. As soon as the female is ripe with eggs make ready a spawning tank. Do not wait too long.



A female *Rasbora heteromorpha* ready for breeding awaits the male on top of a leaf

In many cases pairing fails because the aquarist waits too long, and an examination of the female shows then that the failure is due to egg-binding. Egg-binding happens also with feeding of too much *Tubifex* and white worms over a long period, and it is thought that it may also be due to keeping the fish for too long in hard water.

The breeding tank for both species of *Rasbora* can measure about 18 in. by 10 in. by 10 in. It must be cleaned well. On the bottom put peat pieces to form a layer 1 in. deep. The tank can be filled with very clean and fresh rain water. This is specially important for *Rasbora hengeli*.

For *Rasbora heteromorpha* it is now known that too much attention need not be paid to the question of water quality. For some years it was thought in Holland that we could only spawn *Rasbora heteromorpha* in water of 1-3 degrees German hardness (DH) and of pH 6.4-6.8. Therefore we used added rain water, distilled water and later also deionised water. But recently we have found that such actions are not necessary in many cases. But you must have a really good pair of the species. Some members of my society and I have had much success in breeding *Rasbora heteromorpha* with water of 13 DH and pH 7.0 (neutral) in the breeding tank. The normal pH of our tap water is about 8.3 (alkaline), but we lower this with a peat filter run for 24 hours. Now we have spawned *Rasbora heteromorpha* at various pH and hardness values.

After the tank has been standing in its selected location for a while it is safe to introduce the known pair (normally you can do it 24 hours after filling the tank). With reference to the location of the breeding tank, it is remarkable that in aquarium literature you can read many times that it is not only the water quality but also the lighting that has a

profound influence on the fish, but in this a great part of the literature is incorrect. For example, in some books and articles it is said that *Rasbora heteromorpha* can only be bred when the sun is shining (it is all right, so it is said, if only one sunbeam of light enters the room!). This is supposed to be enough to stimulate them to spawn. I have seen my *Rasbora heteromorpha* spawn in the evening under artificial light and I have also seen them spawning during a rain storm when I could not see further than 50 yards! However, lighting does have an influence, and, as in so much else, the trouble lies between the extremes.

*Rasbora heteromorpha* prefers a tank with diffused light for spawning. One old member of our aquarium society has had many rasboras in his fish house, but only in a few aquaria there were they willing to spawn. This was not a question of sunlight, but one of general lighting relationships of the aquaria in question. When one has a pair of *Rasbora heteromorpha* and they will not spawn it is best to move their breeding tank from one location to another until the best place is found.

When you do not have a shoal of *Rasbora heteromorpha* but only a few specimens then it is important to know how to sex them. *Rasbora heteromorpha* can be sexed very easily: normally the females are a little larger, with more rounded bellies (this is also true for *Rasbora hengeli*). The males of *Rasbora heteromorpha* have in most cases a small black spot of pigment on the underside of the black triangle which is not noticeable in females. Males of *Rasbora hengeli* have a slightly smaller triangle than the females (this can be seen clearly in the colour picture).

Some phases of the spawning procedure are shown in the colour pictures. You can see that some of what is shown in



As soon as the female (*Rasbora heteromorphus*) inverts herself under a leaf the male swims over her and strikes her on the flank or back with the underside of his belly. Immediately after this he changes position and bends his body to enclose the female. A moment later in the embrace some eggs are released by the female.



Here the pair (*Rasbora heteromorphus*) is spawning on the top of a leaf of *Cryptocoryne verticillata*. This is not a different procedure from the spawning under a leaf but it often occurs towards the end of the spawning act. The leaf need not be growing parallel to the bottom; the same happening can occur when the leaf is in a vertical position.

these pictures is never mentioned in articles on this fish. For example, *Rasbora heteromorpha* spawns not only on the underside of a leaf, but also on top of the leaf; this usually occurs near the end of the spawning. Usually the female swims the male under the leaf, but in the latter case she swims above it. It has also happened when the female was not willing and the male courted her in open water, or tried to lure her under a leaf. In courting, the male will sometimes, for brief moments, turn on his back in open water. I have also observed such behaviour with other fishes.

#### Eggs and Fry

Each spawning embrace results in four to ten eggs. However, the eggs do not always remain attached to the leaf. We have found that this is variable even with the same pair; sometimes many adhesive eggs are deposited, sometimes none at all. This is not very important, however, as even the eggs which fall off the leaf will develop. When the spawning is completed it is necessary to remove the pair. If this is not done most of the eggs will be spoiled by

the light. The eggs resulting from the spawning deposited in these pictures all failed to hatch, probably as a result of the flash equipment used.

As soon as the fry are swimming one can feed them with Infusoria, preferably pond Infusoria. If this is not available, small rotifers are also satisfactory, and proprietary baby food for egg-layers can be used. After 3 days newly hatched brine shrimp can be given. At a temperature of 77° F (25° C) the young grow quite quickly and after 12 days they eat Grindal worms and other food of the same size.

In Holland *Rasbora heteromorpha* is susceptible to infection with *Oodinium* (velvet disease). For this disease acriflavine is recommended as treatment, 0.1 gram for each 10 litres (2½ gallons) of water being used. The best results are obtained with strong aeration and a temperature of 80° F (27° C). After a week has passed half the water should be changed, and the greenish colour will disappear.

(Culture and use of fruitflies for fish feeding as mentioned in this article are discussed in the *Aquarist* booklet *Fish Foods and Feeding* by F. N. Ghadially.)

## HOUSE PLANTS IN THE FISH HOUSE



*Vriesia splendens*

**T**HIS attractive plant belongs to the family Bromeliaceae, which contains over 1000 species grouped into some 50 genera. All of the bromeliads are confined to the New World, where they are found most abundantly in the tropics. Included among the species is the so-called Spanish moss, found growing on trees as an epiphyte in Florida and surrounding areas. It hangs in long straggling strands and is used by American aquarists as a spawning medium for tropical fishes. Another bromeliad far better known is the pineapple, *Ananas ananassus*.

*Vriesia*, like many of the other members of the family, in its natural environment grows on the trunks and branches of forest trees. Here the accumulated dust is mainly wind-blown, or mould formed from decayed leaves.

### *Vriesia splendens*

by BARRY R. JAMES

Consequently the potting medium for this plant should be rich in humus. A good mixture is equal parts of peat, sand and leaf mould.

The typical form of most bromeliads is a rosette of leaves with a funnel-like space in the centre. This is filled with water during certain seasons of the year, and is consequently known as the 'vase'. These vases are the haunt of many creatures such as lizards and tree frogs; the latter often lay their eggs in the water and the tadpoles develop in the water contained in the vase, emerge as baby frogs without ever seeing a pond or lake, unlike the majority of their relatives.

*Vriesia splendens* has long strap-like leaves some 3 inches wide and 12 inches long in adult plants. Their colour is attractive, the dark-green ground colour being traversed by bands of brownish red. When mature the plant throws up a tall inflorescence from the vase, which is very colourful, yellow flowers emerging from bright red bracts. These bracts persist for nearly 2 months and the consequent seeds are wind-borne. After this the old plant throws off one or two runners and then dies. The runners should be separated from the dead parent when well formed and potted separately.

In the fish house *Vriesia* should be given a shady position away from direct sunlight from May to September, after which it should be given the sunniest position available. Watering should be carried out regularly during warm weather, the liquid being poured into the vase so that it is always full. Feeding with a weak liquid fertilizer should be done in the same way once a fortnight.

# The Scales of Fishes

by DAVID GUNSTON

THE scales of a fish are the present-day remnants of the heavy, enamelled 'armour-plate' which the earliest-known fossil fishes wore. As in the course of their evolution fishes became more active and speedier, the continuous mail-like covering had to become more flexible. This was accomplished by breaking it up into small sections. In time, fishes also developed more powerful teeth and jaws, so that the need for thick external protection grew less. Even so, a few species with these heavy scales still exist, like the sturgeon and the alligator garfish, whose scales are horny enough to blunt an axe.

Nevertheless, the chief function of fish scales is still protection, which is noticeably evident in those fishes like the porcupine fish and the trunk fish which have stiff or even points to their scales. And at least one fish, the seaperch fish, actually has defensive scales modified into the deadly offensive weapons of its two tail scales extended like sharp knives sheathed in skin but ready to flick into action when necessary. All fishes have a layer of skin over the scales, usually thin and transparent so as to be almost invisible, though occasionally, as with brook trout, it is fairly heavy and makes the scales hard to see. In the sea the skin is so dense that the scales are entirely hidden. Only rarely is a fish's skin unprotected by scales, and then it is usually ossified, as in the sea horse.

## Scale Types

All fish scales are actually dead material, being the chemical products of the skin's activity. They may be formed in either of two ways. In the sharks and rays the skin is broken out into minute papillae, the outer layer becoming horn-hard by the deposition of chalk, rather like the formation of teeth in animals and human beings. In most other fishes the scales are formed as simple plates in the inner layer of the skin or dermis. They do not resemble and are mostly circular or ovoid in shape. These may be further classified into two distinct forms: the crenoid, or wavy-edged spiny scales, on such fishes as perch and bass, making their bodies rough to the touch, and the more usual evenly curved cycloid or smooth scales, found in soft-eyed fishes like the salmon, carp, trout and herring. But there is no fundamental difference between crenoid and cycloid scales, for they sometimes both occur on the same fish. For example, the dab has prickly crenoid scales on its dark upper surface and smooth cycloid scales on the underside.

When a fish hatches from the egg it is quite scaleless or scaled. One or two species, such as the catfish, remain that way throughout their life, but the majority develop their scales before they are much older; minute plates appear in the skin and soon form a complete covering. Coarse fishes have their scale covering when they are between 1 in. and 1 1/2 in. long, whereas salmon and trout then are usually about 1 1/2 in. long. A fish's total number of scales is determined early in its life, no new ones appearing later except to replace one lost accidentally.

Regularly at the appointed age of the baby fish, the little scale plates are formed under the skin, of such a size that by just touching each other they just about cover the fish. Each scale plate is made up of two layers, a flexible, fibrous

lower layer, and an upper brittle layer formed by the deposit of clear bony dentine. The lower layer forms in sheets across the underside of each scale, but the upper layer grows only at its edge, so that whilst its diameter may increase, its thickness never does so. Thus also a scale is always thickest immediately under its original scale plate. The dentine is deposited in ridges and furrows, often irregularly.

The forward end of each scale lies embedded in the dermis, or inner layer of skin, and the free after-end so develops that it covers the front end of the scale behind it, rather like tiles on a roof. This means that the free end of a scale is the only visible portion, though it is very much smaller than the complete scale.

As a fish grows, it must continue to be covered in this overlapping fashion. This is not done by increasing the number of scales but by each individual scale growing to keep up with that small portion of the creature's body which it covered originally. Such growth is achieved by adding new rings of dentine around the edge, in a somewhat similar fashion to the way a tree grows. Where this new material is added to the after-end of the scale, it shows in irregular and poorly marked accretions, but fortunately the larger portion has clearly defined rings on it throughout the life of its owner.

Although these facts have long been known, it is only within about the last 50 years that we have discovered just how much an examination of these scale rings can tell us about the fish. Whereas a tree adds only one ring per year, a fish scale may add many rings annually, but this ring growth varies according to the seasons, the food supply and the activities of the fish to a considerable extent. So much so, in fact, that a trained observer examining, say, a salmon scale under a low-power microscope can tell not only its age, but also how long it has spent in the sea, how many times it has spawned, even, if it has not yet spawned, what its length was at the end of each year of its life. In fact, no other living creature carries on its person such complete and detailed autobiographical evidence.

## Rings

The discovery of just how fish scale rings may be interpreted in this way came from the English and Norwegian researchers, Johnston and Dahl, working independently at the turn of the century. In summer, when the water is warm and food supplies are plentiful, a fish feeds well and grows rapidly. This means that the scales have to grow quickly to keep the fish covered, so the rings are therefore widely separated. In cold weather, however, when food is scarce, the fish lives more sluggishly, eats less, and grows slowly if at all. This results in a slow rate of scale growth; the rings lie close together, and a dark band, termed the annual check, appears. By simply counting the number of annual checks the fish's age can be ascertained. In addition, with migratory fishes like salmon, the summer rate of growth in the sea is very great, with a proportionate wide spacing between the bands, which stand out in contrast to the earlier years of its life spent in fresh water. Further, during its spawning period a salmon or trout temporarily

*Continued overpage*



# Snails—Aquarium Friends or Foes?

by BILLY WHITESIDE

**T**HE question of the desirability of snails in the tropical aquarium is often raised, but no single answer can be given. They have a place in some aquaria, while in others they must be rigorously avoided.

Brooding tanks for egg-laying fish should contain no snails. Not only would many varieties devour actual eggs, but the droppings from snails would foul the water and encourage fungus diseases which could destroy a whole spawning. To prevent the introduction of snail eggs to the tank, plants should, where possible, be avoided. If plants are necessary for spawning they should be sterilised. A solution of carbon dioxide in water (soda water) can be used, the plants being steeped in this for a short period.

In connection with the fry produced from egg-laying fish, one variety of snail can be useful (in a separate tank). The *Ampullaria gigas*, a giant tropical snail with four horns, can produce ample Infusoria for feeding the fry. This snail is a heavy feeder, and consumes large quantities of vegetable matter, and the snail droppings soon produce conditions under which Infusoria thrive. Because of its herbivorous diet, these snails should be given an aquarium to themselves. The water must be maintained at 75°F (24°C) and the inhabitants may be fed on lettuce leaves. Snail shells, being mainly composed of calcium, will dissolve in acid water. To prevent this a piece of plaster of Paris should be placed in the water to neutralise any acid and to keep the water on the alkaline side. Liquid from the snails' tank is siphoned into the fry tank, the Infusoria being eaten by the fry.

In the decorated aquarium, snails can be included for a number of reasons. They could be added for their beauty—if beauty is the word for it; for their scavenger activities; or because they complete the underwater picture which the aquarist is trying to create. All natural stretches of water contain molluscs of some type. When choosing snails for the planted aquarium care must be taken, as many varieties are either unsuitable for tropical aquaria, or are plant-eaters. Three suitable snails are: the red ramshorn (*Planorbis corneus* var. *rubra*); the Australian red snail (*Lanamaria pyramidalis*); the live-bearing Malayan sand snail (*Thiara subornata*).

The red ramshorn does not eat living plants, and its bright red shell contrasts with the colours of plants and gravel. Under ideal conditions it can reach a size of 1 in. across, and produces many young from its batches of eggs laid on plants and glass. Large fishes often snap off the snails' tentacles, and when excess of young are produced, they can be crushed and fed to the fishes as additional live food. Pink in colour, the Australian red snails are smaller and cannot tolerate cool water conditions. The Malayan sand snail spends most of its time digging in the sand. Here it spends the daylight hours aerating the gravel as it acts as a scavenger searching for unwater fish food. At night these snails travel from the sand round the tank walls. If they become too numerous they can easily be picked from the walls after the light has been switched on at night.

All three snails produce excreta which accumulates on the bottom of the tank, and they do not, as some people think, feed upon fish droppings. They do, however, help to keep the plants and glass free from algae growths and they



Photo: Laurence E. Perkins

Freshwater whelk (centre) and ramshorn water snails

feed on material which would otherwise decompose and foul the water. The sand snail should not be used where a layer of soil or peat is used under the gravel, otherwise this will be disturbed and released into the tank water. They are too small to uproot established plants.

If it is decided that snails are to be kept, a few shillings will purchase sufficient for a 24 in. by 12 in. by 12 in. tank. These will soon breed to produce sufficient snails for several tanks, but remember that once they are introduced it is difficult to get rid of them again!

## The Scales of Fishes

*continued from the preceding page*

stops eating and lives upon its accumulated fat. This causes an unmistakable wavy line to appear on the scale rings. With salmon, the spawning drain on its body reserves cuts deeply into the edges of the scales. Some rings may be lost completely, and there always appears the heavy, unmistakable 'spawning mark', which cuts across the earlier rings, dividing them from the new.

Of course, other factors like the blurring, scarring and regeneration of scales affects such readings, but the main principles hold good for all fishes and are of inestimable value to fishery workers.

Fish scales are therefore revealing as well as highly adaptable features, performing their rather odd task for their highly active, stream-lined owners, whilst retaining their basic role as an external skeleton.

## OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

A few days ago I introduced four young red-tailed black sharks into my large community aquarium. Do you think that they will destroy the peace that now exists there as they mature?

*Labeo bicolor* often spar about among themselves but, in our experience, they do no harm to other fishes. All the same, we do suggest that they are kept with fishes of about their own size.

Can you please give me the names of some cichlids which will live together without fighting and, when not engaged in the routine or serious business of courtship, leave the plants and rockwork alone?

Among the cichlids most likely to meet your requirements are *Tropheus maculatus*, *Cichlasoma festuivum*, *C. aurum*, *Aequidens naranus*, *A. curviceps*, *Uaru amphiacanthoides*, the several species of *Sysopterygodon* and the popular dwarf members of the family such as *Apoistogramma ramirezi*, *A. perissus* and others.

I am a young aquarist and my zebra fish have just spawned. I will not have time to prepare a culture of infusoria before the eggs hatch out, and wonder whether you can tell me what to use as a substitute first food for the fry?

Soak an egg for about 6 minutes and then scoop out the hard yellow yolk. Take two or three crumbs of this yolk and crush them in an eggcupful of tepid water. Stir the water round to churn up the yellow particles, and drop a teaspoonful of the mixture into the aquarium at least four times a day over a period of about a week, after which the fry should be large enough to take powdered dried food, supplemented, if possible, with micro worms or freshly hatched brine shrimps. Alternatively, your dealer should be able to supply you with a tube of specially prepared fry food.

I should like to set up a tank for loaches of the genus *Ancistrichthys*. Please tell me the sort of conditions these fish like best.

*Ancistrichthys* spp. flourish best in clear, well-aerated water (neutral to mildly acid) about 8 in. to 10 in. deep. They also appreciate shady, horizontal spaces in rockwork, or thick clumps of plants, as retreating places. The floor of their aquarium should be carpeted with fine sand upon which they can lie comfortably, or burrow into without difficulty.

I have just bought several young ticto barbs. How can I distinguish males from females?

In a few weeks' time any males among them will assume a prominent black marking in the dorsal fin. The male's body is also flatter on the sides than the female's.

Is it true that extra heat alone will clear up an outbreak of white spot disease?

In many cases, yes. But to help effect a cure by heat alone it is necessary to siphon the bottom frequently to

get rid of free-swimming parasites. After every siphoning, sterilise the apparatus used in strong salt water, or Dettol.

Many queries from readers of *The Aquarist* are answered by post each month, all aspects of the fancy being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

I would be most grateful for any information you can give me on the sexing and spawning habits of the butterfly fish (*Paradise fish*).

In well-grown fish the male's pectoral fins have a wider spread than the female's. Further, a male's body is slimmer, and the middle rays of his indented anal fin project in the form of a short genital tube. The species seldom breeds in captivity, but if, and when, it does, the male embraces the female and her scattered eggs float at the surface of the water. The eggs hatch in about 3 days, but the fry are difficult to keep alive because they need a great many tiny flies and similar small insects.

Will artificial rockwork made from cement and sand prove harmful to my fishes and damage the appearance of the plants in my aquarium?

Not if the rockwork is well scrubbed and then soaked in several changes of water (the last with a good dash of vinegar added) before it is introduced into the tank.

I intend to set up a 60 in. tank in my lounge and would like to know the number of heaters I would need to maintain it at a suitable tropical temperature.

We suggest three 100 watt heaters spaced a few inches apart on top of the compost. Place them in a horizontal position and connect them in parallel so that if one should fail to operate the others will continue to function. It will be necessary to have the heaters controlled by a thermostat, otherwise the temperature of the water may rise quite alarmingly in warm weather.

I am a beginner with a large tank kept spick and span with loving care. Yet I have a problem. It is this: I cannot maintain a proper growth of plants because as fast as I buy fresh ones they are attacked by the fishes. The fishes in my tank are platys, swordtails, guppies, *Danio aequipinnatus*, *Pterichthys* and silver tetras.

The only fishes in your tank that will play havoc with almost every plant that you buy are the silver tetras and *D. aequipinnatus*. The others mentioned do little, if any, harm to plant life. Try keeping the avid greenstuff-eaters well supplied with ordinary duckweed or pieces of bruised lettuce leaf. If this move does not result in a lessening of the fishes' appetite for the aquatics, then the only thing you can do is to remove the offenders from the aquarium.

## COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I have a tank 18 in. by 12 in. by 12 in., in which I have two goldfish, two moors and an orfe. Would it be safe to add two green tench?

You do not state the size of your fishes, but your tank will hold only 9 inches of fish. This is the limit and fishes would thrive better if there were fewer. I do not think your tank large enough to add two green tench. These fish can grow to a large size and so your tank would soon become overcrowded.

I recently purchased a shubunkin which has a small swelling on one gill plate. Do you think this to be an abnormal structure or is it a disease?

It is probable that the swelling is a form of tumour or cyst. If it is not inflamed at all there is no need to take any action, but if it gets inflamed it can be painted with a mixture of an equal amount of iodine and glycerine occasionally. If it is a growth it may suddenly burst and then clear up.



In my indoor tank the goldfish sometimes trail long lengths of excreta. The fish appear healthy, but can anything be done to avoid this happening?

Do not worry about this excreta. It is often a sign of overfeeding or the use of food which the fish cannot digest easily. Stop all artificial food for 2 days and all will be normal again. Some types of food will cause this to happen more than other kinds. A few pieces of garden worm in the diet will soon put matters right.

I have a fantail goldfish which remains upside down at the top of the water. When approached it swims down and seems all right. What is the trouble?

This is a disorder of the swim bladder. I have sometimes noticed that a fantail which is getting rather old will lose its balance during the winter. The colder water appears to upset a fish, especially a female who may have a lot of eggs that were not laid during the breeding season. The fish is then very swollen and being normally short-bodied it is certain that the swim bladder is then very restricted. Do not feed the fish at all and it will probably get well once the water warms up in the spring.

My children had three goldfish but two died after a time and the other one has lived for at least 18 years. It now rests head down in the water but otherwise seems healthy. What is the reason? Can it be old age?

It may be old age. You do not say how old the fish was when you had it first. Some goldfish lose their balance if the water becomes cold. The fact that only one lived suggests that there was not enough swimming space in the tank and so the strongest one survived. The fish may recover again once the winter is over, but it is possible that the trouble will recur when the cold weather sets in again.

I have a tank 22 in. by 10 in. by 10 in. with five goldfish and two fantails, about 10 inches in all. I have an aerator and filter but still cannot keep the water clear for long. It soon clouds up although I siphon out some muck each week; I have to empty and clean out the tank once a month. What is wrong with my set-up?

In the first place your tank will only hold 5½ inches of fish. Even with a filter you will not be able to keep a tank which is so small in good condition. Two or three small fishes would be ample for such a tank. There is nothing clever in trying to keep too many fishes. Their droppings will soon pollute the water. Your water plants do not appear to be growing strongly enough. Once you get these plants established they will absorb a great deal of the waste matter in the tank. If you have to empty the tank every month it certainly indicates that the set-up is wrong. A tank should function for many years without needing to be cleaned out. This is only possible if conditions are right; that is: plenty of growing water plants, not too many fishes and care to avoid over-feeding.

I would be grateful for any information about goldfish and also the raising of goldfish from eggs.

This sounds like a junior's letter and I admire the hopes. It would take a book to describe all that you need and fortunately such a book has been written. Save up for *Coldwater Fishkeeping* (price 2s. 10d. post free from *The Aquarist*).

I have two moony which have some small white patches on them. It does not look like white spot but just tiny white flecks. The fish appear otherwise in good health. What can I do to cure them?

This does not seem to be white spot disease, which appears as white, raised spots, not longish flecks as you describe. It may be just some loose mucus. The mucus covering does sometimes come away, especially if the fish have been fed with a different food, the water temperatures have changed or at the change of seasons. Try the usual salt water bath and see if this brings relief. If you can

examine any of the flecks under a microscope you will be able to tell if there is any sign of life. If so treat with salt, but if the flecks appear to be just tiny pieces of mucus the trouble will probably clear up without further treatment.

I wish to make a goldfish pond safe for children playing near it. Can I make a frame and cover it with galvanised wire netting - will this be harmful to the fish?

Such a frame will be all right but to make sure you can wash the wire with a strong hose two or three times a week sometimes fresh galvanising can be rather dangerous to fishes.

What foods would you recommend for goldfish and bitterling?

It would be far easier to list those foods which goldfish would not eat. Almost anything eaten by humans is also eaten by goldfish, and many other foods, such as garden worms, not particularly enjoyed by humans. Goldfish will eat all forms of cereals, dry bread, cheese, cooked vegetables, cooked fish, shrimps, dehydrated meat as well for cat food, and in fact almost anything small enough for the fish to get into their mouths. As for live foods, these include worms, *Tubifex*, white worms, *Daphnia*, mosquito larva and maggots. The bitterling will eat most of these foods, too, but make sure that the food size is small enough for them as they have rather small mouths.

I had a female shubunkin which appeared to be full of eggs and ready to spawn. It did not do so but developed swim bladder trouble. I then destroyed it. Why did the fish not spawn?

It is very difficult to say why the fish did not spawn. Many fancy goldfish either failed to spawn last year or spawned on few occasions. I have thought that it was due to the severe winter we had which affected the fish adversely. The only strange thing is that common goldfish appear to have spawned in ponds better than the fancy goldfish, and I see no reason why these should have been affected any differently from the others.

I have a pond 5 ft. by 3 ft. by 1½ ft. in the garden and last winter lost most of my fish. I now propose to lay a wire netting over it covered with hay. Do you think this a good idea? Could I have an electric heater in the tank?

You could have an immersion heater as used in tropical tanks. Although you could not expect this to keep the pond free of ice in severe weather it would at least keep open one part of the pond and so reduce the pressure caused when the water freezes. I do not like the idea of hay over the pond. This would exclude the light and thus the water in the pond would turn foul. You could, however, cover the pond with a clear polythene sheet. This would keep out some cold but not light.

Could I use an old enamelled bath as a pond in the garden? Would it be safe for fishes in the winter and could it be cropped?

You could use the bath as a small pool in the garden but do not expect to be able to keep fishes alive in it through a severe winter. You could have an immersion heater as used in tropical tanks or else you will have to take the fishes under cover. If by stepping the bath you mean the provision of differing levels at the bottom, you could of course do this but I see no advantage as you would make some of the water much too shallow.

I would be grateful for some information on the sexing of goldfish.

The males show small, white, raised tubercles on the gill plates when in breeding condition. The spots may also appear along the front edge of the pectoral fins. The females do not normally show these marks but have a swollen belly caused by the formation of eggs within. The eggs (hard roe) take up more space than the milt (soft roe) of the male.

Continued on page 210



## our readers

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 Batts, Half Acre, Brentford, Middlesex

### A Show Mourned

MAY I be allowed to reply to Mr. T. H. Marshall's letter in the January issue of *The Aquarist* and at the same time clarify the position regarding the discontinuance of the National Aquarists Exhibition. As president of the National Aquarists Society during the period that the shows were held I can assure you that I more than understand the difficulties which have to be overcome with such a project.

Mr. Marshall's idea of exhibitors supplying their own tanks appears excellent on the face of things, and I may say it was considered on several occasions. In actual fact it is not workable for the following reasons. A very large number of entries in the individual fish classes came from the provinces, and some aquarists made as many as 20 entries; this would mean the loss of almost half the entries in these classes, and if these entries were made up by more local people the Show would have lost its national character. Incidentally, the supply and handling of the small tanks is not one of the main problems.

The National Aquarists Society, unlike the Exhibition, has far from faded and although like most clubs it did suffer a drop in membership for a time, I am happy to say that this phase is passing and the membership is again steadily growing, and an Exhibition at some future date will be in the minds of most members.

From discussions and the study of facts as they are to-day the following points emerge. To run an Exhibition similar to those of the past would cost over £5,000, and this figure runs by about £100 every year. At least 20 experienced aquarists who are able and willing to give a week's service at the time of the show, and have the same spirit of service as the hobby as those of the past, would be needed. Even with these two main essentials there is no guarantee that the show would be a financial success the first year.

We in the National Aquarists Society have that spirit, but we do not have that kind of money; we have a great deal more than 20 experienced aquarists in our ranks, but not here in central London. They are scattered all over the place and for geographical reasons could not give the service required. However, from little acorns big oaks grow; perhaps one day our membership will touch the four figure mark and there will be £5,000 in the bank. Then once again we shall be able to give some practical expression of our existence.

L. B. KATTEING,  
Ashford, Middlesex.

MR. MARSHALL'S letter in the January issue of *The Aquarist* is very interesting in view of the Nottingham and District Aquarists Society's decision to hold a 2 days national open show on similar lines to the old "National." This we have felt has long been needed, but one disadvantage to the venue in London is its great distance from many of the northern societies.

Remembering this and looking at our own unique position in the Midlands, we decided that, perhaps, Nottingham was well placed, and the N. & D.A.S. are fortunate in having funds that would at least lend weight to such a national show being held in this city.

We anticipate offering between 60 and 70 classes, both tropical and coldwater. The Show is scheduled for Saturday and Sunday, 12th and 13th September, 1964, entries being accepted on the preceding Friday. Further details will be available in the very near future, and any society or individual who may be interested is asked to contact me.

I am sure there is room for a National Show where individual exhibitors as well as societies can participate, unlike most other shows, where it is society exhibits only, although it is intended to incorporate society competition at Nottingham.

Thank you Mr. Marshall, and if we see not in the London area I can only say sorry, but I think you will agree there is something in being central for everybody.

I can only hope the aquarists of this country will give us their support and make this an annual event; for upon the response this year depends Nottingham's decision for the future. This, of course, includes the trade as well as aquarists, for when all is said and done the trade relies on the aquarists, too.

W. J. CHRISTIAN,  
20, Beaumont Gardens,  
West Bridgford,  
Nottingham.

### Perseverance with Plant-uprooters

TIME after time something or other is said against the large cichlids. They fight, they uproot plants, you name it—they do it! I would like to say something in their favour.

Let's take the plants for instance. All you need to have is perseverance and a bit of common sense. When I first set up my tank for cichlids I took everybody's advice and kept to rocks and gravel. But this kind of set-up is all right if you are lucky enough to have a fish house: it looks

a bit bare for the living-room. So I purchased some strong plants, such as the *Cyrtocornus*, which I carefully planted. They were torn up by the fish as soon as possible. But I kept replanting them as soon as they were torn up, and in a matter of weeks they were left well alone. I now have various kinds of plants in the aquarium despite the fact that I have two of the allegedly worst offenders for tearing up plants: Jack Dempseys and firemouths.

V. PARSON,  
Cheltenham, Glos.

#### Discus Enthusiast

I AM a keen discus enthusiast and I have six fine large specimens. Unfortunately I do not know anyone who is interested in the discus fish and I would be glad to hear from others with a similar interest.

S. L. TEO,  
59b, Marlborough Place,  
London, N.W.8.

## Coldwater Fish-keeping Queries

continued from page 208

How can I breed Grindal worms for feeding young sticklebacks?

Grindal worms can be bred in a manner similar to the method used for white worm culture. Have some damp peat in a box with a few worms to start, then feed with fluid, but not too wet, porridge. Have a glass cover and many worms will congregate on this.

Two of my common goldfish have developed a kind of blash on their bodies. What is this and how can it be cured?

It appears that your fish are infested with *Oodinium*, the

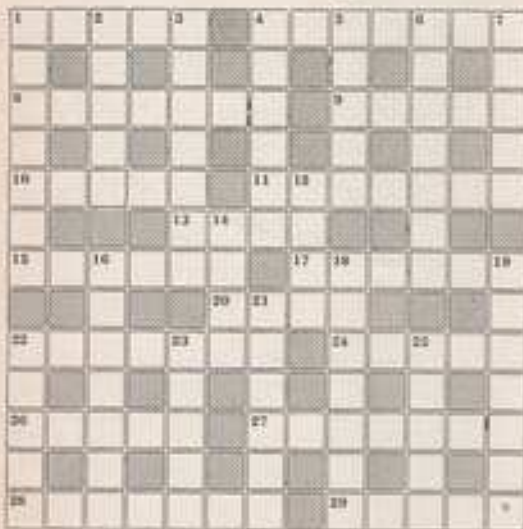
parasite causing 'velvet disease'. This is sometimes caused by poor conditions, such as foul water. The cure is as for fungus: a bath in a solution of a tablespoonful of salt to a gallon of water. Four or 5 days in this should effect a cure.

I have had white spot disease among sticklebacks I placed in an indoor tank. How long must a tank be left empty to be sure the disease is cleared up? Can snails and plants carry it? If all the local sticklebacks are infected how can I safely restock my tank? Dare I now net Daphnia and midge larvae from the garden pond with safety? How long might the parasites remain in the pond if all fish were removed?

To treat white spot disease it is first important to understand what it is. Small parasites get under the skin of a fish and develop there. In this state it is almost impossible to check the trouble. Once the parasite matures it leaves the fish, drops to the bottom and encysts. After a short time fresh small parasites emerge from the cyst, swim around until they find a host and then the whole cycle is repeated. The process is hastened by warm water and so one of the cures is to warm the water to near 70°F (21°C) and to keep moving the fish to a fresh tank each day. The old one is then sterilised and used for the next move. It can be seen from this procedure that the cysts are washed away as they leave the fish and no fresh parasites have a chance of surviving. I think that snails could carry the trouble, and plants, although not as likely, could possibly harbour the cysts. If you think that the local sticklebacks are infected do not catch them. It is so easy to get cheap goldfish to-day, and they would be much better to keep. If the pond is also infested with the parasites it would be dangerous to use any live food from it for feeding fishes. The time it would take for a pond to be quite safe from infestation would depend on the temperature of the water. I imagine that in the winter it is possible for some of the cysts to remain dormant for a long time.

## The AQUARIST Crossword

Compiled by L. BRADLEY



#### CLUES ACROSS

- The little man in the cold warbler (5).
- Sound like a deep salt-water fish (3, 4).
- Somerset (7).
- Common rockpool fish having two dorsal fins (5).
- Can the French eat what mixed? (5).
- A component part of the aquarium heater (7).
- Get up, sit, get up first (4).
- Vigorous or reversed to the sculptor (6).
- Obtained by 18 times hammer of his adult fish (1, 8).
- of Good Hope (4).
- Cargo (7).
- Shark of the aquarium (5).
- Home of the 1 across guppies (5).
- Large building constructed from the dice (7).
- Flies with paper in the wires (7).
- Had that golden touch (5).

#### CLUES DOWN

- Many a fisherman is one of these (7).
- The stern of the ship on the river (3).
- They help to keep your aquatic clean (7).
- For the protection of fishes and reptiles (6).
- Can be in the form of thread or blanket (5).
- Has time (ang.) (7).
- Fish of the salmon family (5).
- Jump (4).
- Admire from excessive admiration in the aquarium (4).
- He takes every young fish to nursery (7).
- Myxobolus heteropodatus* not found here, although it resembles the flag (7).
- Stems (7).
- Capital of Greece (3).
- Trust 13 across for these (5).
- Commonwealth country (4).
- Sightless like *Ancistrus jerdoni* (5).

Solution on page 212





## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

**The York and District A.S.** held their annual general meeting recently and the following officers were elected: Chairman, Mr. D. Greenwood; vice-chairman, Mr. B. Seymour; secretary, Mr. G. B. Haskoby; and treasurer, Mr. A. Boulton.

Meetings are held on the second Tuesday of each month at the British Legion Club, Micklegate, York, and new members will be given a warm welcome. Further particulars can be obtained from the secretary, Mr. G. B. Haskoby, 65, Beaumontfield Street, Airedale, York.

**The Aslington and District A.S.** are holding an open table show in the Hargreave Lane, Aslington, on Sunday, 14th June. For further details, please contact the secretary, R. R. Gordon, 43, Watwood Street, Aslington, Luton.

**The Manchester and District Society of the Fancy Guppy Association** held their annual general meeting recently. The retiring committee were re-elected for a further year of office. The appointments are as follows: Chairman, Mr. J. L. Kelly; secretary, Mr. R. Woodhead; treasurer, Mr. James Allen; show secretary, Mr. F. Campbell; assistant show secretary, Mr. F. Partridge; P.R.O., Mr. V. Partridge; member representative, Mr. J. Jeffery.

A welcome increase in membership during the year was announced, and the average attendance at meetings showed that the interest in Fancy Guppies was becoming greater each year. Meetings are held on the first Sunday of each month at the Tudor Rooms, Langwith Road, Salford. Visor Guidelines, Manchester, at 1.30 p.m. Further details are available from the secretary, R. Bradford, 99, Valley Road, Lower Park, Bradford, Cheshire, and new members can be assured of a very warm welcome.

At the January meeting of the **Dundee Aquarium Society**, the table show awards were: **Best Trophy**, *Rubens*, for which three prizes were won; **Best Trophy**, *Duccio*, for which three were won; **Best Trophy**, *Barbosa*, 1 and 2; J. McGeoghegan, 3; A. L. Burns. The club prizes to date are: **Best Trophy**, 23 Mr. S. Hensell, 17 James McGeoghegan, 1 John J. McGeoghegan, 4; L. Harvie, 7; W. M. Lawson, Andrew Smith, 8; Alex. Cross, 5; P. N. Jennings, 4; C. D. Smith, 3; McGeoghegan, 2; Kenneth and S. Mackenzie, 1; G. R. Kirkwood, 1; Brian Craig and Ian Baird, 1. **Trophy Display**: 205 Albert J. Harvie, 115 William M. Lawson, 112 Brian Craig, 107 S. Mackenzie, 98 E. J. Macdonald, 77 P. Storchon, 65 Ian Burns, 42 Mrs. E. Lowden, 40 B. J. Seymour, 38 E. Walker, A. Barnes, 30 M. Bell, 20 G. A. Harvie, 10 Miss I. Hartley. The programme which followed was a display of coloured slides by Mr. John Alexander. Many were "first hand" and experimental, short and the accompanying talk did much to clear up traps and difficulties.

Recent activities of the **Hull A.S.** have included the presentation by the president, Mr. D. Robinson, of the club trophies, and the

"Aquarist of the Year" Trophy to Mr. A. W. Revely. Following the presentation was a film show and slides to conclude a very pleasant evening.

At the annual general meeting the president, Mr. D. Robinson, chairman, Mr. A. W. Revely, and secretary, Mr. E. M. Steery, 7, Ash's Terrace, St. Paul Street, Hull, E. Yorks., were re-elected.

During the past year the society has competed with Gulls, Thorne and Don Valley societies in a series of league matches. It is hoped to better the second place this year by an all-out effort and become 1964 champions. New members are always very welcome at the club meetings which are held on the first and third Wednesday of each month at the British Railways and Docks Institute, Anlaby Road, Hull, commencing 7.30 p.m.

**NEWS from the Stratford and District A.S.** concerns the annual general meeting which was held in January, at which the following committee was elected: Chairman, Mr. T. Rowcroft; treasurer, Mr. R. Walker; secretary, Mr. W. H. Southall. The annual open show will be held on Sunday, 19th April at the Swanibar & Cowan group social club, Alderfield Road, off Edga Lane, Stratford. Schedule may be obtained from Mr. W. H. Smith, 175, Nelson Street, Bradford, Manchester, 11. The society extends the warmest welcome to any aquarist in the area who would like to join. The meeting place is in the basement of the Stratford Public Hall on the second and fourth Tuesday each month. Meetings start 8 p.m. approx.

The second annual general meeting of the **British Ichthyological Society** will be held on 2nd March, 1964, at 7.30 p.m., in Central Hall, Bath Street, Glasgow. All local members are requested to attend.

The date of the **Chelsea A.S.** open table show this year is Saturday, 9th May. Schedule are available from the hon. secretary, D. G. Arnold, 1, Royal Mews, Hampton Court, East Molesey, Surrey.

The following changes have been notified by **Willesden and District A.C.** Mr. W. C. Hobbs, the former secretary, has now taken over as chairman of the club. Mr. W. B. Sherwin, 252, Tokington Avenue, Wembley, is the new secretary.

The following officers were elected at the **Medway A.S.** annual general meeting: Chairman, G. W. Elliott; vice-chairman, G. W. Richards; secretary, C. F. Sawyer; hon. treasurer, R. J. Abbott; show organizer, W. G. Knott; press agent, A. P. Deane. The secretary's address is 138, Boundary Road, Chatham, and the meeting is held the second Wednesday in the month at Hamerton House, New Road, Rochester, Room 6, commencing at 7.30 p.m. A full and interesting calendar has been planned for this year, and it is hoped to increase the membership to an even greater number.

The election of officers at the annual general meeting of the **Bradford and District A.S.** resulted as follows: President, Mr. R. Westerman; vice-president, Mr. B. Marshall; secretary, Mr. D. Carr; G.L. Sec. Pauls Road, Shipley, Yorks.; treasurer, Mr. B. Nowell; social and publicity officer, Mr. G. Holmes; equipment officer, Mr. N. Booth. Committee: Messrs. D. W. Atherton, P. Mochonson, H. Fletcher, A. Whitfield, H. Greenwood, D. W. Capes, C. Baines. The open table shows are to be held in Uxley Hall, Rawson Square, Bradford, on Sunday, 24th May and Sunday, 4th October. The society has had a very successful year in 1963, and a busy and varied programme is already in hand for the current year. Meetings are held the first Wednesday in each month and any interested aquarist in the area will be most welcome to attend.

The annual table show of the **Association of Yorkshire Aquarists** will be held at Skipton this year on the 3rd May. More details will be available later.

An interesting talk was given to members of **Thorne A.S.** by Mr. D. Chapman, of Sheffield. He spoke about the finer points of judging and fish-keeping for beginners. Mr. Chapman also judged the club table show which was for Bucks. The results were: 1. Mr. E. Brant; 2. Mr. J. Gray; 3. Mr. T. Kirk.

This year the society has decided to hold their annual open show on 7th June at Thorne Grammar School. The club is confident it will be as successful as was last year when they won 8th prize. First prize winners will receive plaques and second and third medals.

A VERY popular feature of the fortnightly meetings held by the **Hounslow and District A.S.** are the table shows which are held at all meetings. Recently a Bucks show was won by Master C. Smith, *Stobert's Barb*, 48 points; second was Mr. Howorth with a *Stobert's Barb*, and Mr. Webb's *Roxy Barb* with 41 points, and third, Mr. Neilham's *Roxy Barb*, 24 points. In a show for Cheshire, Master C. Smith was awarded both 1st and 2nd places with a *Serpae Tetra* and a *Lenora Tetra*, 65 and 77 points. 2nd was Mr. Pratt's *Serpae Tetra* with 60 points. A very full and interesting programme has been arranged by the committee. The society meets at 26, Heath Road, Hounslow every other Wednesday; the secretary is Mr. D. J. Woodward, 16, Elmfield Road, Hounslow.

The **Blackpool and Fylde A.S.** recently invited the members of the **Leyce Aquarists (Lancashire)** to an inter-table show and social evening. The table show was a draw. The vice was recommended when members of the B. and P.A.S. travelled to Lancaster for an enjoyable evening. Instead of an inter-table show, one member from each society set up a furnished aquarium, Mrs. Smith for **Leyce Aquarists**, and Mr. G. N. Hatley for **Blackpool**. **Leyce** were the winners on this occasion.

The Annual Fish of the Year competition for the **Fletcher Trophy**, has been won by Mrs. F. C. Wilkins. Winners of table shows held during the past 12 months were: Mr. F. C. Wilkins who won the following: **Singleton Trophy for Single Fish**, *Rubens*; **Trophy for pairs of fish** and **Large Trophy for Breeders**. Mr. Ken Pearson won the **Fletcher Trophy for Home Furnished Aquarium**.

The Annual Dinner and Dance took place recently when 130 members and co-members and friends attended.

At the recent Annual General Meeting of the **Thames Valley Aquarist Club**, the chairman was able to report a moderately successful year but unfortunately there had not been the increase in membership, which of course, he would like to see. Officers elected for the year 1963/64 were as follows: Chairman, Mr. R. Nicholls



(re-elected); secretary, Mr. P. Rowell (re-elected); treasurer, Mrs. B. Nichols (re-elected); show secretary, Mr. E. Nicholl; librarian, Mr. P. Jarvis; publicity, Mr. G. Pearson; and caretaker, Mr. S. Weston.

Trophies were presented as follows—Member of the year Mr. R. Nichols (plaque); Home Aquaria competition winner, Mrs. E. Paul (Silver cup and plaque); Mr. P. Rowell who secured the most prizes at table shows over the past year was awarded the *Sawbury Shield*. This shield was donated to the club by an ex-member.

**THE** schedule of the **Hendon and District A.S.** open show is now being drawn up by show secretary J. Morris. The event will be held at the Society's headquarters and more details will be available later. Programme sheets showing the programme for the Society's weekly meetings during the next six months have been printed and distributed to the members. Both new-comers in the hobby and experienced aquarists are catered for. Monthly table shows for all classes of fishes are featured and are so arranged that members have the opportunity to show each species of fish at least twice in the year. Trophies competed for by members are to be won in the Home Furnished Aquaria and Pond Competition, and the *Roehampton Trophy* Competition for miniature (10 x 8 x 6 furnished aquaria which are set up at the meeting. Visits to duckers showrooms and, during the longer summer months, a Pond Hunt is planned in the form of a competition. Members are supplied with a list of water insects, crustacea and plants to collect. At the end of the evening completed specimens on the insect form are handed and a prize is awarded to the member gaining most points.

The Society meets every Thursday at 8 p.m. at The *Brookwood Hall*, Edgware Road, West Hendon, N.W.4. New members are welcome and are invited to contact the secretary, Mr. A. E. Harvey, 2, Dallas Road, Hendon, N.W.4, who will be pleased to send details of the Society.

**THE** *Barton and District A.S.* held their annual general meeting recently when the following officers were elected: Chairman, Mr. E. Walker; vice-chairman, Mr. M. D. Letcham; general secretary, Mr. J. Mills; social secretary, Mr. G. Dregg; show secretary, Mr. T. Myers; treasurer, Mr. A. Adams; news letter editor, Mr. R. Forson. New members are particularly welcome at our monthly meetings held on the 2nd Wednesday of each month at the *Barley Mow Inn*, Main Street, *Sussex Hill*, *Barton-on-Trent*, commencing 7.30 p.m. For further information please contact the general secretary as above, 47, *Hawfield Lane*, *Witchill*, *Barton-on-Trent*.

**THE** fourth annual open show of *Middlebrough and District A.S.* will be held in All Saints Hall, *Grange Road*, *Middlebrough* on Friday, Saturday and Sunday 10th, 11th and 12th April. Schedules and further information from the show secretary, Mr. Keith Whetton, 18, *Downshire Brook*, *Lidbury*, *Middlebrough*, *Td* 87810. At the annual general meeting the following officers were appointed: Chairman, Mr. D. Clark; hon. secretary, Mrs. N. Mason; vice-chairman, Mr. G. Hodges; treasurer, Mr. J. Andrews; assistant treasurer, Mr. R. Clark; show secretary, Mr. K. Whetton; auditor, Mr. G. Hodges; Mr. E. Mason; Committee: Mrs. N. Mason, Mr. G. Hodges, Mr. D. Clark, Mr. D. Lohman, Mr. E. Mason, Mr. K. Whetton, Mr. B. Clark, Mr. A. Ramon, Mrs. N. Hodges.

**AT** the inaugural meeting of the *South Wales and Monmouthshire Characin Society* the following officers were elected: Chairman, Mr. R. D. Johns; vice-chairman, Mr. R. Harris; hon. secretary, Mr. M. J. Parry; hon. secretary, Mr. N. Cousins; treasurer, Mr. J. D. Burgess; show secretary, Mr. K. G. Davies; auditors, Mr. and Mrs. G. James.

Meetings are held on the third Saturday of the month at "The Old Inn", *Church Street*, *Cardiff*. Further details are available from the secretary, Mr. M. J. Parry, 45, *Western Drive*, *Cardiff*, and new members or visitors can be assured of a warm welcome.

**THE** *Bracknell and District A.S.* are holding this year's "Three Counties Open Show" at the *Victoria Hall*, *Bracknell* on Saturday 11th July. Full details will be available shortly from the Three Counties Show secretary, Mr. K. S. Phillips, 40, *Pondmore Road*, *Bracknell*, *Berk*.

**IT** is with deep regret we announce the death on 23rd December 1964 of Mr. L. Taggar, who was treasurer of *Riverside A.S.* for many years. His passing will be greatly missed by all who knew him.

**THE** following Officers and Committee were elected at the A.G.M. of the *Bedford and District A.S.*: President, Mr. G. S. Smith; chairman, Mr. J. J. Barry; treasurer, Mr. G. Booth; secretary, Mr. K. Sarratt; show secretary, Mr. R. Smith; committee, Messrs. Jeffs, Adams, McWhirter, Cotton, Wells and Taylor. *Managers*, Jeffs and Harrell. *Awards* for the year, Highest points gained in table shows: Janet J. R. Thompson, B. Smith; A. K. Sarratt; *Gavia Trophy Best One Pound*: R. Thompson; *Georgeson Trophy* highest judged Goldfish: J. J. Banks; *Martins Trophy* highest judged Tropical: R. Thompson; *Brewster Prize*: A. Jeffs. The chairman reported that during the year there was a steady increase of new members and that attendance at meetings was very good. Also entries for table shows were up on previous years.

It was agreed that the Society should meet once a month during 1964 and this was settled to be the second Thursday of each month at the *Guldbrook*, *Harper Street*, *Bedford*. All people interested in any aspect of fishkeeping are welcome at meetings.

**AQUARISTS.**—The annual meeting of *Rugby and District A.S.* was held recently. The financial statements presented by the treasurer, Mrs. G. Plasson, were passed as satisfactory. The *Harbert Cup* for the highest points obtained in last year's table shows was presented to Mr. K. Russell, who had a score of 690. The runner-up, Mr. R. Dawson, who scored 393 points, was presented with a shield. The election of officers resulted: Chairman, Mr. V. Robinson; secretary, Mr. R. Dawson; treasurer, Mrs. G. Plasson. Among proposals for 1964 were instruction in breeding guppies to show standard; Table shows to cover goldfish and tropical fish; a dinner and a summer outing to *Cherry Aquarist* and on.

**IT** was with regret that members of the *Bedford Aquarists and Pondkeepers Society* heard at their meeting that Mr. Ernest Atkins, of *Queensborough Gardens*, *Ilford*, who was president last year and treasurer for about 20 years previously, had died.

Mr. Atkins had been ill for some months but before his illness he rarely missed a general meeting or a committee meeting. He was keenly interested in the hobby, particularly in the raising of goldfish in his garden pond, for which he won the society's annual pond competition on numerous occasions. He was held in high esteem and will be sadly missed by his many friends and acquaintances.

At this month's meeting it was a pleasure to have a return visit of Mr. A. Leutsch, the well-known naturalist, who gave an interesting talk on pond life in *Spring Forest*, accompanied by some excellent coloured slides of underwater life, and his annual ponds in the *Essex countryside*.

The table show was for any variety of egg-layers and any variety of freshwater and the results were: Egg-layers: 1, Mr. Brix; 2 and 3, Mr. Soudwell. Livebearers: 1, Mr. Shadock; 2 and 3, Mr. Bull.

**THE** date of the *Skipton and District A.S.* 1964 open table show is Sunday, 22nd Feb. and this will be held at the *Antonian Hall*, *Skipton*.

**AT** the general meeting of the *Burton Aquarist and Zoological Society* the following officers were elected: Secretary, Mr. L. Lewis, P.N.A.S., 25, *Rectory Road*, *Burton*; treasurer, Mr. G. H. Thomas; show secretary, Mr. A. Radcliffe. There will be an open table show on Sunday, 1st March at the *Water Youth Club*, *Coler Road*, *Burley*, and similar classes may be had from the secretary. One of the items of this show will be the new class for *Terran Fishery*. It has also been decided to compete at the next R.A.F. show later this year and plans are already being made for the stand.

Last year was the best for over five years, and new members can be assured of a warm welcome.

**MEMBERS** of the *Leyton Aquarists* held their first annual general meeting recently, when the results of the two competitions were announced and new officers elected. The winner of the *Best all-rounders* competition was Mr. J. Mills, second was Mr. M. Parry, and third was Mr. D. Jones. The winner of the *Home aquarist* competition was Mr. E. Jones, second was Mr. J. Whalley, and third was Mr. D. Jones. The president of the meeting, Mr. E. Jones, of *Windsorians* presented the prize winners with their trophies and gave a vote of thanks to the judges. The following officers were elected: Chairman, Mr. D. Jones; secretary, Mr. J. Mills; treasurer, Mr. E. Jones; auditors, Mr. B. Hammett and Mr. E. King; Committee: Mrs. Smith, Mr. Hammett, Mr. Deacon and Mr. Wilson. New members can be assured of a warm welcome. Full information may be obtained from the secretary, Mr. J. Mills, 31, *Brookfield View*, *Bolton-le-Sands*, *Cardiff*.

**A SPECIAL** item in the *Donkey A.S.* News Letter is that the annual convention of the M.A.A.S. will be held at *Poor Division*. The magazine is bright with a variety of articles and well worth putting on the exchange list of club magazines.

#### SECRETARY CHANGES

*Griffin A.S.* (Mr. W. R. Tucker, 41, *Leadbriar Crescent*, *New Addington*, *Croydon*); *The Fancy Gluppy Association* (L. R. Barnfield, 99, *Valley Road*, *Arden Park*, *Beaconsfield*, *Chesham*); *Wiltshire and District Aquarists* (Mr. W. K. Sherrin, 252, *Tokington Avenue*, *Wembley Middle*); *York and District A.S.* (Mr. O. B. Hawkey, 65, *Roostfield Street*, *Armsby*, *York*).

#### Crossword Solution

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 AFFICLMBH  
 NITELLACOBIE  
 GOOTLAILL  
 LANCELEMENT  
 ERRISENN  
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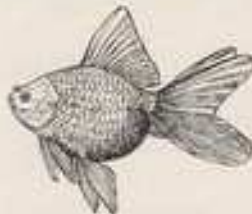
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