

# The Aquarist

and Pondkeeper

MAY 1964



MONTHLY  
Vol. XXIX No. 2

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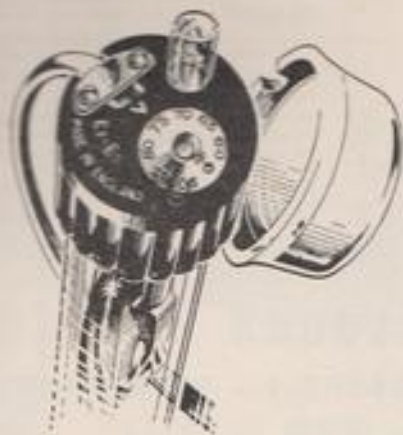
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THE AQUARIS



# The AQUARIST AND PONDKEEPER

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## When Marine Trop?

"WHEN are we going to be able to have tropical marine aquaria?" is a question that is often asked at meetings when general discussion topics are invited. It is possible to answer this with a peremptory "You can have 'em now," but this is to ignore what lies behind the original question. What is meant is: When can we hope to keep the exotic marine fishes with the same degree of success that we expect with tropical freshwater species? It is easy to be critical about slow progress in this field, but progress is being made and in actual fact the not-too-ambitious aquarist who wants to keep only a few marine fishes can already expect to maintain a marine aquarium successfully, although not without extra trouble and preparedness to learn new techniques.

Equipment was once a major difficulty. We had to use painted iron-framed tanks and metal and rubber parts for aeration and filtration systems, none of which lasted long in contact with sea water and did in fact make it poisonous for the fishes. With the advent of plastic aquarium apparatus this source of trouble has gone. Aquaria of all sizes with plastic-coated frames which remain unaffected by sea water can now be obtained, and all other accessories are available in such resistant forms.

Sea water itself remains a problem for all but coastal aquarists. It is essential to have a substantial reserve unless the aquarist has facilities to make up a synthetic mixture from salts. With the use of large plastic bags in cardboard boxes the storage problem is not as hard to cope with as it was when glass carboys or stone jars were all that could be used, but storage is a limiting factor that will restrict numbers and sizes of tanks for use.

Tropical marine fishes are imported by relatively few dealers, they are expensive (and are likely to continue to be so) and are demanding in their feeding. Many of the more spectacular types eat only living foods such as brine shrimps or small fishes, and this will limit the aquarist in the number of such fishes he keeps, if he is to meet the requirements of all his charges properly. Most bemoaned by many aquarists, however, is the near-impossibility of having a planted aquarium decor; marine plants do not survive in aquarium conditions and as yet no solution to this difficulty has been found.

# Even a Worm Can Turn!

by R. A. DOVE

ABOUT 10 years ago I found myself in the position of many aquarists in winter: hundreds of fishes and not enough live food. The local pet shop supplied *Tubifex* of somewhat doubtful ancestry, resounding price and at erratic intervals. I therefore decided to collect my own fresh worms weekly from Father Thames.

For an operation of this type there are one or two obvious basic requirements, namely a couple of buckets and a sieve. Not quite so obvious to the uninitiated is the need for a strong pair of rubber thigh boots (strong thread on the trouser buttons!) and private transport. Imagine the reactions of bus passengers to an evil-smelling tramp sitting in the next seat nonchalantly hugging a dirty great pail of wriggling *Tubifex* in his lap! The chances, however, of slipping by the conductor without arousing his sensorial suspicions relating to sewers are quite remote and it could be a long and uncomfortable walk home.

Having checked the equipment, the next point is the state of the tide. It can be most frustrating to arrive at high tide, as the usual method of collecting does not require deep-sea diving equipment. Conversely, it can be rather exhausting lugging a couple of buckets containing mud, old bones, other repulsive river refuse and, we hope, *Tubifex* a quarter of a mile over mud flats to the riverside for the sieving operation. A quick glance at *The Evening News* will confirm tide times and ensure arrival when the river is about half way. I favoured a rising tide, giving the worms the maximum time to rise and matt on or near the mud surface.

One has to be pretty sure-footed and not in the least squeamish to be a successful collector. I'm sure that most of our lady aquarists would feel most despondent finding their feet transfixed in a bank of black stinking mud and pitching head first into a bucket of *Tubifex*. I can speak from experience! However, it can be quite interesting in the summer provided that your reflections whilst working do not dwell too long on typhoid, tetanus and Emergency Ward 10!

Now down to the serious task of reaping the harvest. Most professionals have their closely guarded hunting grounds. As a rule the most rewarding areas are mud banks built up by the tide on the down river side of an obstruction such as a moored barge or old houseboat. These mud flats tend to build up like snowdrifts and can be very deep and treacherous. Under ideal conditions the *Tubifex* congregates near or on the mud surface and can be scooped up with bare hands and placed in the bucket. When two buckets have been filled with a mixture of worms, mud and the aforementioned etceteras one retreats stealthily from the exhumation. This retreat cannot be hurried, for the suction on the rubber boots is extremely powerful and leads to one's downfall only too easily, as already mentioned.

Meanwhile a third bucket and the sieve have been left at the water's edge and it can be most inconvenient if the tide has crept in unnoticed, or local Teddy-boys have absconded with a new 'football' whilst you are stuck in the mud. Incidentally one fiendish trick of local youngsters is to observe their target (that's you) from the opposite bank and explode a firework in one of the many drain pipes exposed by the low tide, when you are exactly in line. The concentrated sound hurtling across the otherwise quiet and peaceful river is quite staggering.

Assuming none of these misfortunes assails you the next step entails half-filling the sieve with the mixture and riddling with the sieve partly submerged in the flowing water. For a moment, more about the sieve: most commonly used is one similar to a good garden sieve with an extra fine mesh. By riddling in the usual manner, using both hands, all the mud is washed away, leaving worms and other large solids. The latter can be kept to a minimum by careful choice of mud flats. Personally I favoured a sieve shaped like a bucket with gauze on the base and sides. Fitted with a strong rigid handle, this sieve can be used single handed by rotating the wrist rapidly in opposite directions. When the washing is completed the contents are emptied into the third bucket and the process is repeated until the mud buckets are emptied. A further trek up to the mud bank is now indicated with muttered prayers to heaven that some stupid so-and-so doesn't kick the fruits of your labour back into the Thames whilst you are stuck by your boots in the mud bank!

The average return from a bucket of mud can be about 60-70 per cent of clean worms in mid-summer. Hear can be the worm's worst enemy and for this reason it is best to hurry home with the buckets not more than half-filled to avoid suffocation of both the collector and the collected. By this time all the solids, coarse sand and grit will have settled to the bottom of the pail and with a little practice it is quite easy to dive two hands in, feel the strata and lift the worms out cleanly in the shape of a large pancake. As we all know, shallow running water is the next essential for maintaining the worms in the pink. By the way, the unwanted solids make an ideal medium for tomato growing!

Winter collection of *Tubifex* is an entirely different matter. It is not too hard to visualise the difficulties of a collector during a cold spell. Imagine plodding along the foreshore into the teeth of a blizzard in a temperature of minus 5°C then, with bare hands delving into a pile of freezing muck only to find, after sieving, that the return is about ¼ lb. of very nondescript worms per bucket of mud. The mud banks are washed downstream by the strong tides and the yield from the gritty foreshore can be heart-breakingly low. I have known full-time collectors spend 4 or 5 hours obtaining 6 pounds of worms. January and February are the worst months; if you examine your worms at this time you will notice how coarse and tired they look; they've lost their "get togetherness" and are most reluctant to get knotted. When the thaw sets in the Thames becomes swollen miles downstream and the collecting sites will be continually under water from one tide to the next.

When you are unable to obtain your next supply think of the folk who grovel for the stuff all the year round, day in, day out and nights as well, if the tides demand. Perhaps sixpence per thimbleful is not so expensive after all!

Have any readers strong views on the use of *Tubifex*? I know of experienced aquarists who swear by it, others who condemn it as a source of disease. One thought then: *Tubifex* do live in mud but they are washed in ever-changing water. Surely, therefore, provided that the worms have been kept sufficiently long to disgorge any impurities, they should present less risk than our invaluable *Daphnia*, inhabiting filthy stagnant ponds frequented (and well laced) by visiting sheep and cattle? Controversial? Material for further contributions I should think.

# The Florida Flag Fish

by JAS. STOTT

**A** NATIVE of Florida, the flag fish (*Jordanella floridae*) is an attractive and interesting species but one possessing a somewhat unpredictable temper when in a tank with other species. Peace may be kept, but on the other hand *Jordanella* may suddenly declare war on every other inhabitant in the tank that isn't of its own species. This should not deter the aquarist, however, who feels like it from keeping them, for they are well worth a tank on their own.

The fish seldom exceed 2 inches in length with both sexes, but when in breeding condition and full of spawn the female will be seen to have a deeper body line and thicker girth. When seen in breeding colour the male is a splendid fellow. The basic colour is, in parts, a bluish green with areas of brownish olive here and there; the whole of this is overlaid with a network of reddish orange and copper markings. There is a gleaming dark spot just below the leading edge of the dorsal fin on the body and two or three brownish markings along the back. The dorsal fin and the anal fin are lined with dark red spots in rows while the base of the caudal fin is spotted with reddish brown dots. The female has much quieter colouring and is predominantly a brownish green with little or no red.

They require live food to achieve breeding condition, but at the same time they must be able to obtain green food otherwise top-top condition will not be attained. For this purpose duckweed is undoubtedly the best. *Nitella* and algae are also taken, so these can be provided as well to other variety. A temperature of 72°F (21°C) will keep them quite happy but this should be stepped up to 78°F (25°C) for bringing them up to breeding form.

A 24 in. by 12 in. by 12 in. tank is suitable for breeding with a pair, and well matured water should be used. The bottom of this tank should be covered to a depth of a couple of inches with coarse sand and the rear half of the tank planted with well-rooted *Cryptocoryne* and spatterdock. Plant them so that they form thickets along the back of the tank. Set the temperature at 78°F (25°C) and allow the tank about a week to settle before introducing the breeding pair. Then supply plenty of duckweed over the surface and proceed to condition.

Before the actual spawning takes place there is a certain amount of courtship display on the part of the male, which is followed by a period of quietness when the breeding pair remain for long periods slowly swimming around each other in tight circles out in the open water in front of the plants. The spawning is immediately preceded by a sudden movement into the planted part of the tank, where the male will commence to nose around the base of the plants with the female closely following his movements. Eventually the male will make a shallow depression in the sand, usually at the base of a plant, and in this the eggs are deposited.

After this the female will leave the planted area and move out into the open water, leaving the male with the eggs, for he takes on the job of tending them until hatching occurs in around 5 to 6 days time. He will look after the fry in this area until they are free-swimming, at which time he will leave them to fend for themselves. After the spawning the female can be removed from the breeding tank, followed by the removal of the male when the fry become free-swimming.



Flag fish (*Jordanella floridae*)

Infusoria should be supplied immediately this stage is reached and green water is also essential for a good start with the fry of *Jordanella*. The need for green food is important all through life with this species, to produce and maintain condition. Keep the water temperature at 78°F (25°C) during the early days of the fry and get them on to newly hatched *Cyclops* and brine shrimps as soon as they are large enough to take them, when growth will become marked. By the time the young fish are 2 months old the temperature can be gradually dropped to 72°F (22°C) and as much variety introduced into their feeding as possible, which helps produce fitness and obtain maximum growth.

## The Goldfish Patrol

**A**T long last the goldfish has come into his own. No longer is his purpose in life confined to just pleasing the beholder's eye. Two healthy goldfish are a small, but very important, part of a nation-wide investment by the mighty Esso Petroleum Company in the United States of £2.13 million a year for cleaner air and water. Despite the size of the investment and the excellence of the water filtration plant the two goldfish have the last say about cleanliness.

From the continuous flow of water used by the Texas refinery, samples of purified water are taken and are constantly piped through the goldfish tanks. If the water isn't clean enough for the two goldfish—it isn't clean enough to be returned to the river.

# My Ideal Breeding Pond

by A. BOARDER

**M**Y breeding pond was made many years ago, and although it has functioned fairly well I would make several changes if I intended to make another one now. Having gained considerable experience over the years I would know what to do and what not to do.

The type of pond I would make would be in the shape of a cross. There would be a central small pond about 5 feet square. From this centre pond four side ponds, each about 3-4 feet wide and about 6 feet long, would form the arms of a cross. The sides would be sloping at an angle of about 60 degrees. This would not be so that any ice which formed could slide up, as I know only too well that this will never happen. Once there is a coating of about half an inch of ice on the side of the pond it will stick tight and it is very difficult to move at all, never mind it sliding up. No, the idea of sloping sides to the pond is to obviate the necessity of using shuttering to hold vertical concrete in position whilst it is setting. Shuttering is expensive to buy, and, of course, perpendicular sides are unnatural.

## Planning

A pond should be planned well before any actual work is started, as faults cannot be rectified easily once the construction is commenced. A good open site is essential, where there are no over-hanging trees. A high part of the garden is to be preferred if such is possible, so that the pond can be emptied more easily if this is needed. Once the shape is marked on the ground the soil can be dug out to the required depth and the under part thoroughly rammed down. If some brick-bats can be included, the base will be much firmer and form a good bed for the concrete. I suggest a finished depth of 3½ feet for the central pond and 2½ feet for the four side ones.

If a strong helper can be obtained the hard work of mixing concrete can be halved. Alternatively, it is possible to get ready mixed concrete delivered to the site by a firm. This would mean that the site would have to be ready and that when the concrete arrived it could be put into position as soon as possible before it started to 'go off'.

If it is intended to mix the concrete oneself it is necessary to obtain a quantity of clean washed sharp sand, some ballast (aggregate), also well washed, but with much larger stones in it than can be found in the washed sand, and some fresh cement. If you find that your cement has hard lumps in it you may be sure that it is stale or that damp has reached it. Some people recommend that a coating of very coarse mixture is laid first and that this is then floated over with a layer made of three parts of sand to one part of cement. I do not like this idea as it not only makes more work but there is the danger that the second coat might not adhere to the first one adequately.

It is often said that there must be a waterproofing agent incorporated into the concrete, such as one of the types of cement sold especially for the purpose. However, ordinary cement in properly mixed concrete will give a waterproof job. I have made many concrete tanks with ordinary cement and sand, and although these tanks are only half an inch thick they hold water for years without the outside showing dampness. I have also made concrete boxes not much more than a quarter of an inch thick which

will also hold water. The inclusion of special waterproofing agents in pond concrete mixes is unnecessary, in my experience.

The aggregate, sand and cement are well mixed dry (turned over three times). The water is then added and the whole turned again three times until all signs of sand have disappeared. Do not make the mixture too sloppy. Once you have laid a quantity then is the time to tamp it down. This is done with the back of a shovel. After the mixture has been well tamped down, you will find that all the larger stones have sunk towards the bottom and all the fine mixture has risen to near the surface. This is the ideal finish, as it will be very strong, composed mainly of the smaller stones and cement. It can then be roughly smoothed, either with the back of the shovel or a float. There is no need to try to make a smooth surface. The quicker this task is completed the better will be the result.

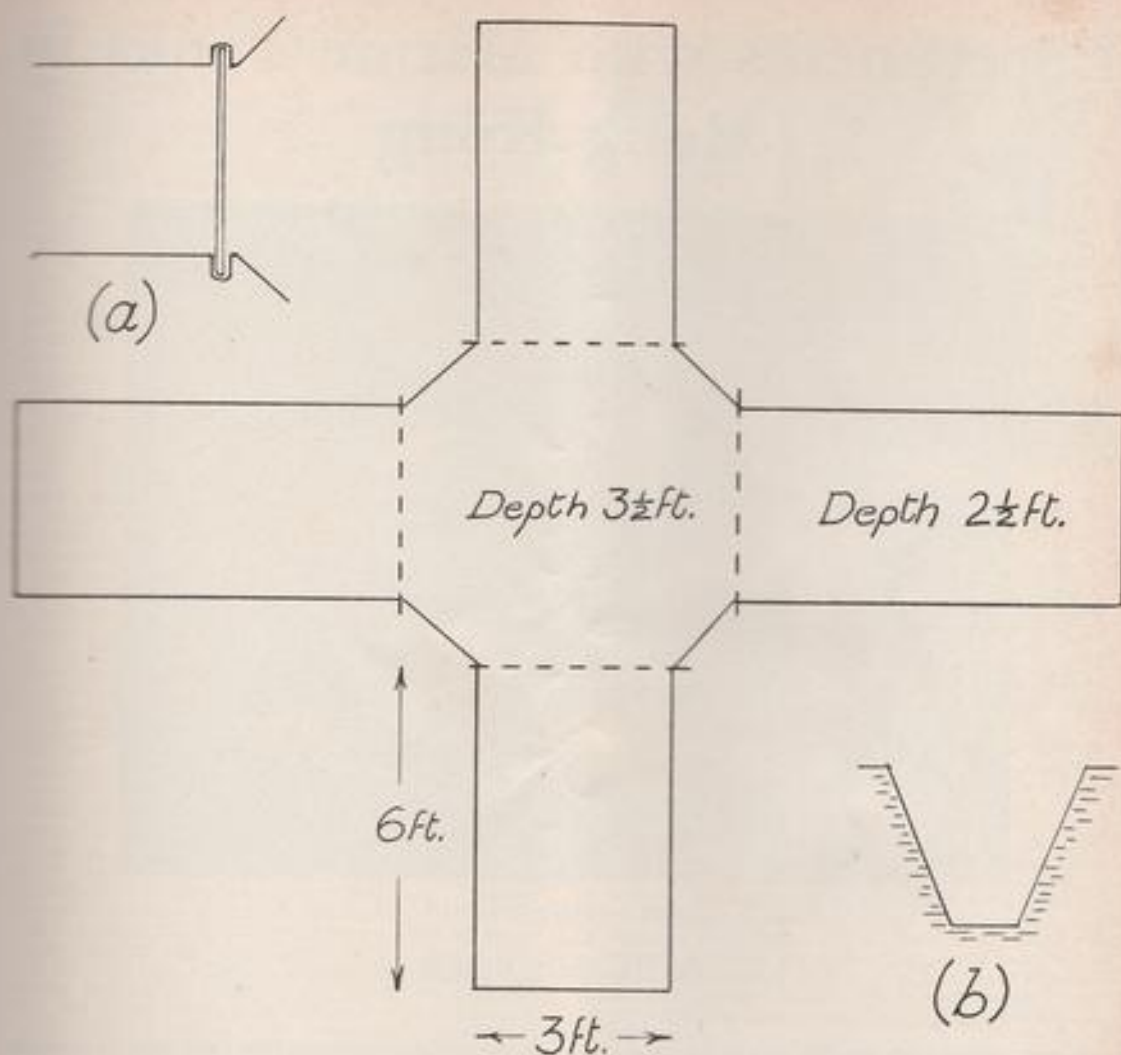
The design of my ideal cross-shaped pond would include provision for partitioning the sections. To do this, when you are constructing the centre pond it will be necessary to make slots so that divisions can be inserted to close off any or all of the four side ponds. These divisions can be of glass, slate or similar material. If the slides are made first and a thick layer of newspaper is wrapped round each end, the whole can be concreted into the correct position. When the concrete is set, the slide with or without the paper can be drawn out. The paper is easily removed if it is left in the grooves.

See that there is at least 4 inches depth of concrete all over the pond, and a little more will be of benefit. If you have some reinforcing iron at hand this can be embedded into the concrete as you work. The stronger the concrete is made the better will it be able to withstand hard frosts.

If it is intended to make a surrounding path, do not include this in the actual structure of the pond. I did this years ago and have regretted it ever since. My path was an integral part of the pond. This looked well until very hard frosts occurred. The soil surrounding the pond froze deeply and in consequence rose upwards. This lifted the path and caused a crack almost all round the pond about 4 inches down. Any path made should be quite separate from the pond. A very good plan would be to make a number of concrete slabs and lay these to form your path.

## Maturing

A pond can be filled with water in about 4 days from construction. If the freshly made surface is sprayed with water twice a day during this period if the weather is warm, this will prevent too rapid drying. Concreting should never be done in frosty weather. After the pond has stood for a few days filled with water, it can be partly emptied and all the concrete scrubbed well with a stiff broom. Wash it round well, fill it again and repeat the scrubbing after another 3 or 4 days. It can then be refilled and left for a further period of a few days. After another scrubbing and wash round the pond can be filled ready for stocking. Many people think it essential to paint the sides to prevent harmful free lime from harming the fish, but if the pond has been well scrubbed and washed there should be no danger.



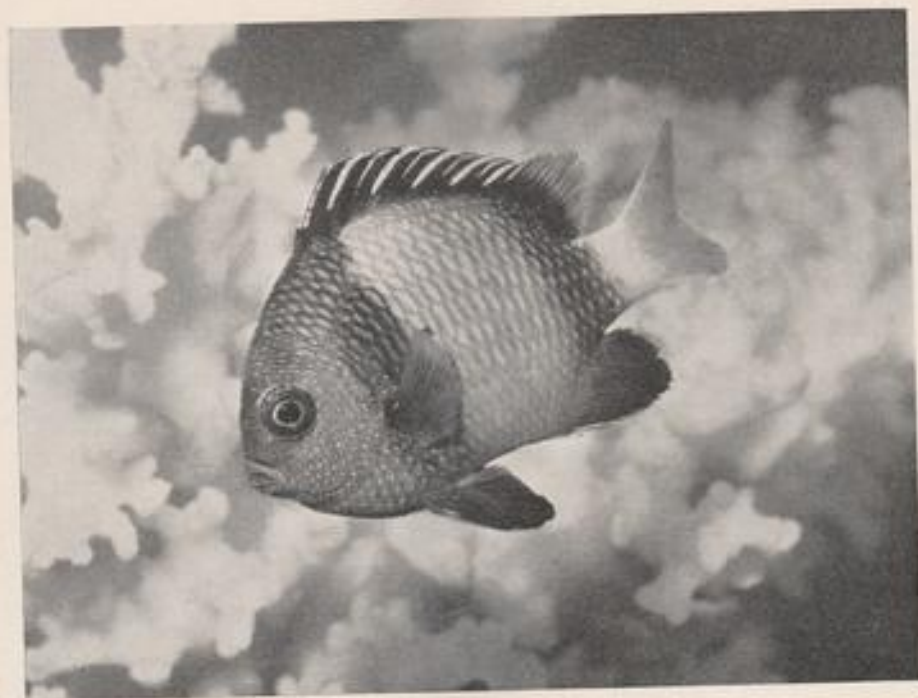
Plan view of the ideal pond: (a) plan of division for one section, indicated by broken lines on the main plan; (b) sectional view of one of the side ponds

When planting it is better to set each plant of any size, such as a water lily, in a separate container. This makes it much easier to remove it for cleaning-out purposes. One of the side ponds can be left fairly free of large plants and have instead a good crop of fine-leaved plants to receive any eggs laid; this pond would form the spawning area. Once fish have spawned here it can be divided off with a slide after the fish have been enticed out. This enables the eggs to hatch out without them being eaten by the parent fish. Then another arm of the pond could be used for a further spawning and in this way the parent fish can be kept away from the eggs and fry. This is the advantage of the cross-shaped pond to the breeder. Also, in it fishes

of different sizes and types can be accommodated safely.

It would also be possible to keep a few carnivorous fishes such as perch in one division, and these would not be able to interfere with the more peaceful fishes. Other advantages of this pond would be that any part could be shut off for cleaning purposes without upsetting the other sections, and in a severe winter a section could be divided from the main part and heated with an immersion heater to keep at least this area free from ice. Any experienced pondkeeper will soon realise the advantages of a cross-shaped pond to the breeder or to the aquarist who wants to keep several different species isolated from one another.

# Experiments with Marine Tanks in Hong Kong



Damselfish (*Dascyllus auratus*)

by HUSEIN ROFÉ

IN my article in last month's issue I described the difficulties I had in obtaining a usable aquarium, and mentioned the contamination of the sea water that occurred from iron present in my tank's construction.

Salt-water pH content seems to be another bogey. Certain indicators persistently pronounce my tank water dangerously acid, while other brands show it to be within the safe margin. The former brand continued to give danger signals after I had poured a generous sprinkling of chemicals into the filter. Now I hardly ever make a pH indicator test, I never use these chemicals, and there is less trouble. If there is any sign of trouble in the tank, if specimens appear unhappy, out they go into the plastic bucket to bask in the sunlight for a few days. Nevertheless, I keep my boxfish and *Pomacanthus semicircularis* exclusively in a smaller all-plastic tank. I found that both types persistently became ill in the large tank, as they are apparently more delicate. In fact, I lost one of each, but since their removal to the 8 gallons tank where they live alone with two shrimps and a hermit crab, there has been

no more cause for concern. The *Pomacanthus* is especially subject to a 'blotch' disease, which causes the brilliant blue to turn milky-white in patches. This is evident in the photograph illustrated in Dr. Ladiges' *Tropische Meeresfische*, though the illustration is merely labelled "colouring in youth".

Salinity control may be a very important factor, but the data given in American handbooks on this subject may not be entirely suitable for the region of South-East Asia. They usually recommend readings of density between 1.020 and 1.025. On two occasions I have lost entire communities by slow correction of salinity to bring it up to the recommended level. My own readings, taken in summer from different parts of our coasts, are nearly always in the region of 1.015 at a temperature of 84°F (29°C), which should correspond to about 1.019 at 60°F (15°C), and I have even had readings two points lower still. If I increase the salinity content by the addition of 'pure sea salt', the fishes breathe hard, show evident distress and sulk out of sight in the far corners of the tank. A possible explanation may

be that the creatures of the Indo-Pacific zone are accustomed to more diluted water, since they live in the vicinity of land masses where heavy rainfall is characteristic, especially in summer.

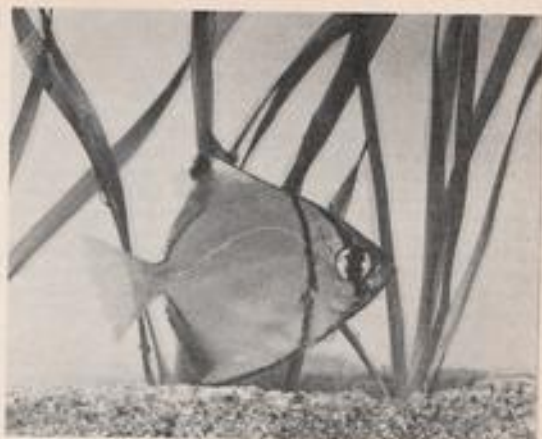
I have never yet attempted to make use of artificial salt water, partly because it would cost me five times what I pay Chinese coolies to fetch water from the sea. Even filtered water from the harbour left in an empty tank for a few days with no illumination and both sub-sand and outside filters running constantly seems a safe medium. Not enough space is devoted in the average text-book to warning the novice in advance of the need to provide himself with several spare tanks, or at least with buckets full of spare water. Many catastrophes may be traced to the lack of an adequate reserve of aged and filtered water. Even that which we use for hatching out the brine shrimp is equally a potential source of danger, unless time has been allowed for micro-organisms to die off during storage in a dark cupboard. Antibiotics, effective against bacteria, are apparently useless where other parasites are concerned.

I have known three types of marines to develop "pop-eye" disease in my tank: dark clowns (*Amphiprion zanthurus*), a batfish (*Platex teira*) and the domino (*Dascyllus trimaculatus*). With the first-named species this disease is especially common, and I have noted it among specimens still in the fisherman's boat. The complaint is supposed to be connected with gas disturbances. Nevertheless, in the first-named, a deep-sea dweller, sudden change in the intensity of light may be a contributing factor. My own clowns used to go blind from this complaint regularly until I reduced the electric light wattage and gave them more darkened corners in which to hide, and I have never had this trouble since. In fact, in every single case the complaint has subsided when shelter was provided, a comfort of which the patients were not slow to avail themselves.

These large clowns are delightful pets and seem to be happy in the company of smaller *Amphiprion percula* and all *Dascyllus* types. They have some endearing habits: sometimes they plunge through the water with a rocking movement, they express disapproval (particularly of newcomers) by rushing up to them with clearly audible grunts, and they actually dance with pleasure if small live shrimps are put in the tank as an occasional treat. Although they like to hide among the rocks, they observe all that is going on, and are always the first to snatch food away. They are not good companions for the batfish, since they disturb him by rushing rapidly out for their meal, while his consequent wheeling and veering upset them in turn. They will eat most foods: *Tubifex*, bloodworms, chopped fresh shrimp and Japanese fish bread. Unlike the *Dascyllus*, they find Bemax (wheat germ) too small to merit attention.

The batfish is another of the easiest marine tropicals to maintain. Dr. Ladiges mentions a *Platex orbicularis* which survived in Hellabrunn Aquarium for nearly 10 years. These fish are found in the neighbourhood of harbours in Hong Kong and the Philippines, and I picked up mine from a dealer who had it all alone in a tankful of scats, which he kept in equal parts of fresh and salt water. It was then about 1½ in. long. Yet the bat's rapid growth makes him a similar problem to the freshwater Oscar (*Astronotus ocellatus*), of which I keep a pair, now 2 years old, all alone in a 45 gallon tank with no plants. They have already reached a length of 10 in. I could not foresee how fast the bat would outgrow his quarters. As a youngster, he had about four little yellow spots right in the centre of his body, on each side, natural markings in young specimens. Later, he developed ugly large white spots, sometimes turning into patches, on the tail. Impervious to standard freshwater immersions, these disappeared when painted repeatedly with tincture of mercuric iodine.

The batfish is not a choosy eater, and relishes all foods mentioned above, but is far happier when given small



*Monodactylus argenteus*

guppies, swordtails and marine fry. A suitable fish for beginners, he will stand many trials, and was apparently unharmed by spending 2 days in a plastic bucket without aeration. Only his growth is a drawback, and a full-grown specimen may reach a length of 10 in. or more, apart from the greater "wing-span". The colour changes startlingly from a dull, uniform brown in poor lighting to a black and white pattern under bright illumination, and this, of course, is the way he is normally photographed.

The most delicate species I have tried to keep are the Pacific butterflies (*Chaetodon*), all with black and white markings on a yellow background, though even these are harder than the long-nosed *Chelmon rostratus*, which succumbed within 48 hours. That specimen, like the *Chaetodon octofasciatus*, was imported, and the latter striped butterfly bears, when young, an astonishing resemblance to the freshwater *Symphysodon discus* in youth.

The local *Chaetodon* species are hardiest if obtained when about half-an-inch long, and usually go on a hunger strike if captured when large. I find them susceptible to the complaint described by Robert Straughan as "paralytic shock", and therefore they need especial care when first introduced into new water. I have also met the hunger-strike frustration with captured shrimp fishes, which died within 8 days.

The waters around Hong Kong abound in therapons, sergeant majors and scats, in that order of commonness. All of these are hardy, and the mortality rate is low, though the first two varieties look so colourless beside the more gaily hued reef fishes. As for the scats, I have thrown both these and *Monodactylus aureus* straight from freshwater into marine tanks and vice versa.

I have a pair of *Monodactylus* in the freshwater tank which were just "dumped" into it 6 months ago because of lack of space in the marine tank. They are now 7 inches long, very full of life. Their swiftness is such that they need about 60 gallons, and they now live in a tank 5 feet long. Since they are accustomed to spend most of their lives in the sea, it is advisable to include fresh chopped shrimp in the diet, and they gobble it up with avidity, before any other specimen has a chance.

Sea horses from the Indian Ocean are fairly hardy, though my pregnant male developed the usual gas complaint after giving birth, and spiralled pathetically round in successive somersaults when he tried to swim. A brine

shrimp diet does not seem adequate, and guppies a few weeks old are appreciated. I have even seen one cleverly secured by a sea horse with its prehensile tail. The 70-odd year-old Pung Tak On (George Bing), doyen of Hong Kong aquarists, tells me that local sea horses are to be found near the famous Floating Restaurants of our Colony, in clusters of seaweed, and that this particular plant contains elements essential to the nourishment of the new-born babies.

As I stressed recently in an address to the members of our Chinese Y.M.C.A., Hong Kong offers a fruitful field for research into marine fishes' habits, and is in dire need of both a public aquarium and an aquarium society, neither of which exists at the moment.\* The only marine tanks seen in the Colony are in restaurants, where gourmets eye their prospective dinners. The unfortunate inmates, although provided with constant aeration, are usually overcrowded

and diseased, and may comprise such species as the goat-fishes and even the larger clowns, in addition to the ubiquitous grouper of local menus. Meanwhile this race of experts on freshwater tropicals and goldfish ignores the marines, dismissing them with a summary: "Very hard keep", and marine coral fishes remain perhaps the sole appurtenance of modern Western culture which are not actively imported and exported daily in this Far Eastern shoppers' paradise.

\* Since this article was written an aquarists' society has been formed in Hong Kong. This is the Hong Kong Aquarium Society, address c/o G.P.O. Box 14882, 17 Coine Road, Hong Kong, and in the Society's first report to The Aquarist it was stated that over 100 fishkeepers in the Colony had applied for membership. One estimate puts the total number interested in the hobby there at 3,000.

## How to Culture Mealworms

by ROBERT BUSTARD, B.Sc.

I AM frequently asked by lizard collectors how to overcome the inevitable food shortages which occur from time to time, especially during the winter. Like most animals, lizards thrive best on a variety of food, but quantity is also important and it is valuable to have a standby food supply always on hand. Some collectors purchase gentles (maggots) and these are often not readily available during the winter and are relatively perishable. Often it is not possible to purchase small quantities suitable for the collector with only a few lizards. However, fly pupae will not hatch if kept cool and so one purchase can be made to last for several months. The gentles are allowed to pupate and the pupae are placed in a refrigerator at about 40°F (4°C). When flies are required a suitable quantity of pupae are removed and placed in the vivarium, where they will hatch in several days.

The other main standby, and for many lizards undoubtedly the most useful, are the larvae of the flour beetle (*Tenebrio molitor*), popularly known as mealworms. Mealworms can be purchased readily throughout the year but since they are expensive (if any quantities are used), and are very simple to breed, it is a good plan to keep several cultures on hand. The life cycle is fairly long, which means that it takes several months to get a culture to the stage where you can start cropping it, but once it reaches this stage mealworms will be available from it for many months. Ideally, several cultures should be set up at intervals of about 6 weeks and cropped in rotation. Activity will be increased (and the life cycle accordingly shortened) if they are kept warm; 77°F (25°C) is a good temperature. Large biscuit tins or other similar containers are suitable as culture containers and several handfuls of food mixture should be placed in the bottom, then a layer of sacking, then more mixture followed by another layer of sacking and more mixture. The best food mixture consists of pollard and bran (1:1, by volume) or alfalfa and bran (1:1, by volume). The containers are covered with lint or other material which will retain the insects but allow free ventilation. When a culture is set up, about 100 beetles or pupae or larvae should be added, the culture labelled and dated and put aside for some months. Naturally the cycle will be completed sooner if beetles are used to set up the culture. When beetles are present in cultures their fertility can be improved by feeding

them with raw carrot. Once a week I cut a carrot in half and drop it into each culture containing beetles.

Only the larvae or mealworms are useful as food. They are accepted as food by most lizards and the size can be selected to suit the lizard, which is a great advantage.

Mealworms are excellent food for all agamid lizards. With large lizards such as bearded dragons (*Amphibolus barbatus*), which relish mealworms and will take 50 or more at a sitting, it is perhaps best to feed them on mice and other large prey unless large stock cultures are kept. For the smaller agamids, however, mealworms are excellent, varied with other food as available. These remarks apply equally well to iguanids. Perhaps it should be stated that the common iguana (*Iguana iguana*) is not strictly vegetarian as popularly thought, and relishes mealworms as well as raw meat in addition to the usual vegetable food. The zonures (*Cordylidae*) and the Anguidae (which includes the slow-worm, a slug- and worm-eater) as well as the popular American alligator lizards (*Gerrhonotus*) also relish mealworms. The Varanidae (monitors) largely prefer raw meat or larger prey but the many small species of insectivorous pygmy monitors common in parts of Australia, such as *Varanus acanthurus* which does well in the vivarium, readily accept mealworms. The large families Teiidae and Scincidae together with the well-known members of the Lacertidae also contain many species which do well on mealworms.

Lizards like the green lizard (*Lacerta viridis*) have large appetites and if they are to be adequately fed without a great deal of expenditure of time or money it is essential to culture mealworms. Even those fascinating lizards the chameleons may often be induced to take mealworms. Some specimens of *Chamaeleo chamaeleon* will accept them, together with most specimens of *C. bitaeniatus bitaeniatus*, *C. bitaeniatus höhnelli* and *Microsauria panula*. Although many geckos, like chameleons, tend to feed on winged insects the majority will also take mealworms. I maintain a research collection of several hundred geckos in Australia on a basic diet of mealworms, maggots and flies. Mealworms are also acceptable to many frogs and toads, some insectivorous snakes and many insectivorous mammals and birds.

Now is the time to set up cultures if they are to be ready for use next winter.



# "Sharks" for the Aquarium

by L. B. KATTERNS

THIS type of fish has become quite popular among aquarists during the past few years; this is probably due to the fact that they have dropped in price considerably, are nearly always available, and are by no means as bad as the name shark indicates.

Much has been written about these fishes and I do not know of any others where the opinions of writers differ so much, some stating that they are very ferocious and cannot be kept in an aquarium with any other fish, and some who say they may be kept without harm in a community tank. Suggested food and requirements also differ considerably.

The fact that fishes are living creatures and each individual has a temperament of its own, which is created to a great extent by the surroundings and conditions under which it lives, make it very easy to form a wrong opinion of a group of fishes. I have had very many fish of the 'shark' type pass through my hands and have found that if a large specimen of, say, 3 inches or more is introduced into a small aquarium, or into a tank containing small fishes, there will most likely be trouble, but if only small specimens are used they will settle down and live in complete harmony with almost anything of the same size.

A fair-sized tank is advisable, as sharks like to take over a small portion of the tank to themselves, and given space to do this will rarely interfere with other fish. If a number of sharks are kept together there will be quite a lot of sparring up to each other, but it is seldom that any real damage is done.

## Red-tailed Black Shark

The red-tailed black shark (*Labeo bicolor*) is by far the most popular in this group. When young the body colour is grey and the tail amber; with growth and age these become jet black and crimson. Red-tailed black sharks have the typical elongated shark-shaped body and very pointed fins, which are larger than average. In a large aquarium these fish can grow to 6 inches if well fed. *L. bicolor* is native to Thailand and the breeders in that country are now breeding these fish in their pools in order to supply the great demand for these fish from aquarists. The red-fin shark (*Labeo arcybaui*) is very similar to *L. bicolor* in body shape, but the fins are slightly smaller and, as the common name describes, are red, although it is rare to see a specimen with very brightly coloured fins. The body is a dark olive green and this fish is sometimes listed as the green shark.

*Labeo variegatus* is similar to *L. bicolor* in shape and finnage, the latter being almost transparent and the body covered with many small light patches. It can also grow to a much larger size than the other two *Labeo* species. This fish is rarely obtainable and can only be seen in some public aquariums. The three fishes mentioned have similar requirements, a temperature around 74°F (24°C) suits them very well and at this temperature coloration is at its brightest. Feeding presents no problems whatsoever, as they will take almost anything; an occasional feed of live food and some algae should be included in the diet to keep them in tip-top condition. If vegetable matter is excluded from the diet the plants in the aquarium are likely to suffer, especially the soft-leaved varieties such as water fern and *Hydrophila*. The silver shark (*Balantiocheilus melanopterus*) is a species that has quite recently become available and

is very popular among aquarists. Most of the fish available are in the region of 3 inches and as this species can grow to a length of 14-15 inches are really small specimens. They are most active fish and also noted for their jumping abilities, so should always be kept in an aquarium having a cover.

## Silver Shark

The body is streamlined and bright silver, sometimes with a golden sheen, and it is the coloration of the fins which make this fish such an attractive addition to the aquarium. All the fins are orange at the base, fading to a beautiful lemon yellow, and all have a wide black band at the rear margin. *B. melanopterus* can be safely kept with fishes of similar size and when with other fishes will take all kinds of food, but if kept alone it is apt to refuse the dry foods. There appears to be no easy method of distinguishing the sexes, the fullness of the ripe females being the only indication.

## Fatty Degeneration



FATTY degeneration affects the internal organs of fishes and although it is a disease rarely publicised it is the most probable cause of the vast majority of premature deaths occurring in the home aquarium. It produces absolutely no symptoms other than possibly infertility and is caused mainly through incorrect feeding.

If too much food is given containing fats and carbohydrates, in contrast with proteins, then fatty degeneration will occur in such internal organs as the liver, kidneys, swim bladder, heart and reproductive organs. As each organ is essential to the fish (with the exception of the reproductive organs), any impediment will cause serious harm and eventually death will occur.

As there are no definite symptoms to indicate the course of the disease and as the process of degeneration is slow, death occurs without any apparent cause.

Once fatty degeneration begins a definite cure is impossible. The remedy therefore lies in ensuring a good varied diet throughout the life of the fish.

R. E. Macdonald

# My Elegant Terrapins

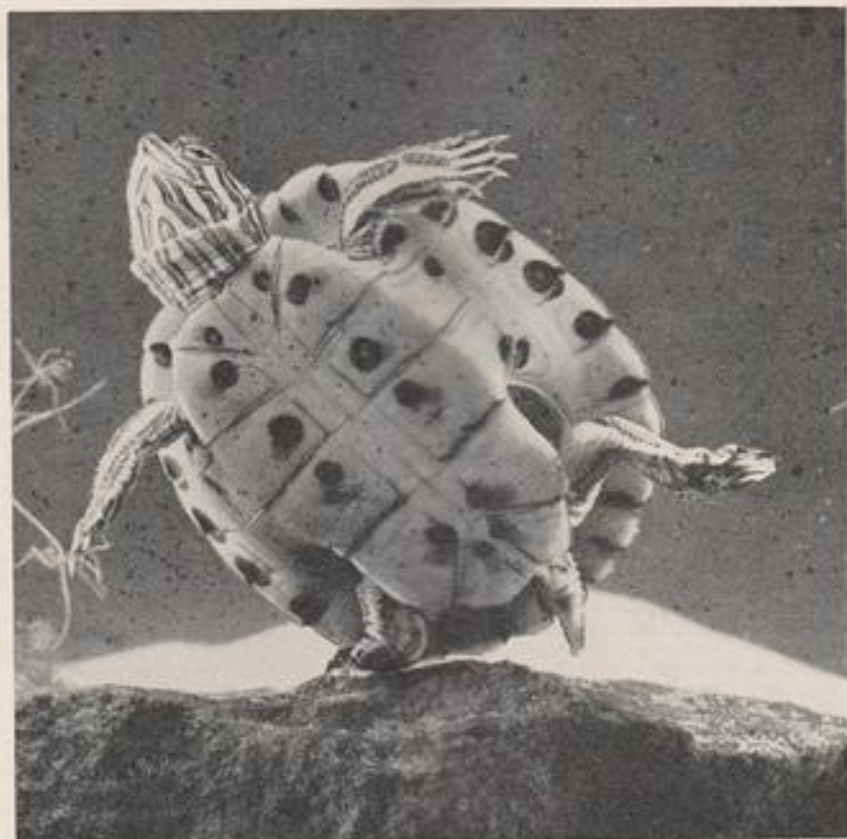


Photo:

Elegant terrapin, underneath view

Robert Buxford

by JENNIFER DUNFORD

"TAKE the liveliest one" said the man in the pet shop, pausing in his task of cutting up dogs' meat, "it's more likely to live." My friend with whom I was staying leaned over the tank with me, and we picked out a baby terrapin which was paddling up and down by the glass, objecting to its confinement more than most of the animals.

Just then a slightly smaller one started to move around, too. I do not like keeping animals singly, I could not decide which one to have, and, anyway (according to what I had read), one at least would probably die, so I bought the two. I added two drums of 'turtle food', and at another shop bought a packet of dried flies I thought my fishes might like for a change.

Back at my friend's house, the pair of terrapins brought

exclamations of delight from mother and sister. Everyone falls for baby terrapins.

"Oh, aren't they lively!" "Like little toys!" "They can't be real!"

The half-crown-sized babies trotted gravely about on green-and-yellow pin-striped legs, putting out their heads from a fold of skin like a polo-necked sweater to show an orange stripe behind each eye. Their shells, striped green and yellow round the plates, were so perfect they appeared to be moulded in plastic. Removed to the tropical aquarium, the tiny creatures paddled down to the bottom and swam about among the startled fishes. After more ecstatic exclamations, the family moved away.

Next I opened my foods, and was none too pleased to find that both dried flies and 'turtle food' consisted of the

same thing, i.e. small thin mussel-like bivalve shells, dried out larvae, and various other odds and ends. Still less was I pleased when the terrapins utterly ignored this mixture. They seemed determined to starve, refusing also the bacon I used as a substitute for the raw meat I had been recommended. For 2 days they ate nothing, and I took them home wondering how much longer they would stay alive.

The Sunday joint was in the 'fridge, so I hopefully cut two strips and held them above the little miseries. To my amazement and joy, one lifted its head, opened a huge triangular mouth underneath and engulfed the meat in its jaws.

This solved the feeding problem, but soon I was worried about the temperature of their tank. It was 65°F (18°C), 10°F lower than it should have been, and the pair were very sluggish. They seemed to appreciate having only half an inch or so of water above their gravel, though; it made breathing easier.

#### Home Improvements

The next day I decided to do something about their tank. The first thing they needed was heat, so I used my spare heater and thermostat for them. The water warmed up, but the reptiles were inclined to sit on the heater. I had read they could scorch their shells doing this, so the heater would have to be shielded. After some thought, I burnt a hole just big enough for the heater in the small end of a plastic sandwich box and put the heater in. This would keep the terrapins off, but I had to let the water circulate. To this end I made a metal knitting-needle red hot and punched holes all over the box. Then I put the heater back, securely enclosed but open to the water, which I had to make about 3 inches deep to be sure of covering it.

Next, I decided to put some rocks in the tank. I chose limestone, to make the water hard and alkaline so it would help build their shells. I put in first one slab, and then another to form a bridge between the first slab and the heater box. This anchored the heater box and gave the animals a chance to get out of the deeper water (a chance they never take—they spend all their time under this bridge). I added a flat piece of stone to form a feeding table.

A few pieces of dwarf *Vallisneria* completed the set-up, which was found to be very satisfactory: the terrapins have now lived in it for some months.

#### Diet

I soon found the terrapins will eat almost anything I feed to my fishes. They will attack and devour earthworms, or grab at *Tubifex* and suck them in, like undignified spaghetti-eaters. They fight over chunks of meat, and really appreciated the remains of a sprat I had dissected in a biology lesson. The only thing they refuse to eat is 'turtle food' in its original form, but they will even condescend to take this if it is mashed into a paste with Bemax and offered in small portions on the end of a wooden spatula. At nights they must eat large quantities of plants, to judge from the triangular nips taken out of the leaves, but I never catch them at this. The terrapins are very peaceful, however; the two live guppies I put in for them to eat thrived so well on the scraps that they have grown up and reared a healthy family of eight, and I do not believe the terrapins have once considered eating them.

Terrapins make the tank a lot dirtier than fish do, especially since they often shed their skins in little bits. The only way I can keep the tank clean is to remove them every week, catch the guppies, uproot the plants, take out the appliances, drain off the water, wash the gravel, scrub out the tank and then put the whole assemblage back with fresh water and (usually) plants.

#### Talking Point

The terrapins are not only interesting as reptiles. They are a social asset. Visitors . . . a meagre dribble of conversation . . . then someone notices them, usually around tea-time when they are fed. Then come the familiar exclamations of delight, followed by my explanations and answers.

"Oh, yes, they're terrapins, like miniature tortoises only they live in water. Tarry and Pin, yes, that's what we call them. Look, Pin is the one trying to climb off my hand, he's always been active; Tarry is the quiet one. He's grown bigger than Pin though, he used to be quite a lot smaller."

By then the ice is broken and conversation flows. (No, we have not yet come across anyone repelled by them as "creepy-crawlies".)

So, in fact, my pair of elegant terrapins make charming and interesting pets, and are perhaps among the least demanding of reptiles.

## Heather at the Pondsides

by JAS. STOTT

It is rather surprising, as one goes about, to find how infrequently is use made of the hardy heathers in the planting of pond surrounds, even when this includes a rock section or crazy paving. Actually, once the plants are established no other form of planting is more troublesome, for apart from a little annual trimming to keep the plants neat and shapely little else is needed. Not only are they attractive in bloom but after the flowers are gone the foliage on these shrubby, compact plants is also attractive. Furthermore, with selective planting, it is possible to have flowers for a considerable part of the year, even well into the winter, and that can be useful at the pondsides in the hind part of the year.

Most of the various heathers require a rather open, acid soil or a sandy soil in which is incorporated plenty of peat.

They do not thrive in lime soils in the main but there are one or two varieties which, luckily, can be grown where lime is present and they are the *carnea* and Mediterranean heaths.

A collection of heathers skilfully used as pocket plants with a paved surround of a formal pond can look extremely attractive and when used in conjunction with alpines, can be useful subjects in a crazy-paved surround. To obtain a prolonged period of bloom, however, discriminate and selective planting is needed. It is also a good idea to use three or four plants of each variety and one variety to each pocket or group. The best time for planting is from the end of October to the beginning of March, but, of course, choose a time during this period when the weather is open and without freezing spells.

For pockets in the strictly formal type of paving the following varieties are useful subjects. Flowering in the early months of the year is *Erica carnea* Springwood Pink, of vigorous growth and spreading habit. It is a pink form of the Springwood White and the two look well together.

Providing greater height, and flowering a little later, is *Erica mediterranea*, of dense growth, dark-green foliage and pale-pink flowers.

An attractive variety of *E. mediterranea* with its silvery white flowers borne in great profusion is Silver Beads, and another variety growing taller which flowers in May is *E. med. superba*, a great help to bridge the gap between spring and summer varieties. To follow on with bloom for June and July is *E. cinerea* Purple Robe, which as the name implies is a lovely deep purple and is a 'must' in every collection of heathers. For a position closer to the edge of the pond and forming a pleasant contrast with the taller species is *E. scoparia nana*; having exceptionally bright green foliage it is a useful plant in winter.

The cross-leaved heaths are delightful subjects with their long flowering period, which extends from June to early October, and by far the most attractive variety is *E. tetralix alba mollis*, which has striking silver foliage and pure white flowers. Another delightful variety is to be found in *E. tetralix machiana plena*, a double-flowered shell-pink. These cross-leaved heaths appreciate a damp spot and therefore are suitable for the lower levels in the rock edging of the less formal and informal type of pond. They

are also the right appearance for planting with the crazy-paving type of surround and the varieties Constance Underwood, deep crimson, and L. E. Underwood, apricot-pink, for such a position can be added to the list.

To cover the autumn period the native species form a good beginning to the season and *E. vulgaris praecox* is an early bright red and looks well in company with *E. vulgaris praecox alba*, which is, of course, a white. Another attractive white which is a double one but of very dwarf habit and blooming a little later in the autumn is *Calluna alba flore plena*. Of even shorter habit are two varieties excellent for use with crazy-paving close to the pond edge: *Calluna Foxii nana*, a miniature bush only 3 inches high bearing lovely purple flowers; *Calluna* Sister Anne, growing 4 inches in height and with pinkish lilac bloom.

A heather with a different kind of foliage is *Calluna serotina aurea*, a white-flowered variety with bright golden foliage which turns bronze in mid-winter. It blooms in autumn and grows to a height of some 12 inches. For late autumn and mid-winter blooming use *E. hybrida Darleyensis*, a free flowering pale purple variety, and *E. carnea* Winter Beauty, a bright pinkish purple.

## OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

**My young angel fish have developed what appear to be black specks on their gill-covers and sides. Is this a sign that something is wrong?**

Many angel fish develop black specks on their sides. These markings are nothing to worry about. It is said that only the true scalare (*Pterophyllum scalare*) is devoid of such markings. In brief, *P. cinctum* and its hybrids have them.

**My male Siamese fighting fish has developed pop-eye. Is it possible to effect a cure of this disease?**

In many cases, yes. With the fish held gently in a net, take a fine, sharp-pointed needle and prick around the eye to release the fluid. Now irrigate the eye with a mild saline or boric acid solution. Repeat treatment after a day or two if the eye fills up again. Most important: keep the patient's strength up with generous feedings of a favoured live food.

**For several months I have used lumps of coal to decorate my tropical aquarium. Now I notice that the coal has become covered with a reddish to brownish coloured fluffy scum. Will this growth harm the fish?**

In all probability your aquarium has not received all the light it should have had last winter. This deficiency would lead to the development of brownish, fluffy algae. Alternatively, rusty pieces dropping into the water from the underside of the aquarium frame will also lead to a reddish or brownish scum forming on rockwork and the sides of the aquarium. We suggest that you remove the rockwork from the aquarium and give it a good scrub and a thorough rinse under running water. It would also be a good idea to rake over the compost, and then siphon away an appreciable quantity of water from the bottom. Make good the loss with previously boiled water from the kitchen tap. The fish should not come to any harm if you take the action suggested within the space of a week or two.

**Is it possible to cure swim-bladder trouble?**

Yes, in mild cases taken in their early stages. The important thing to do is to keep the patient in water only just covering the erect dorsal fin. Next, maintain an even temperature slightly above normal. Finally, see that easily swallowed live food is given. Ordinary black cooking salt in the proportion of one teaspoonful to every gallon of water

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.

often proves beneficial, except for most catfish and some loaches, which are harmed by it. It may be necessary to keep a fish suffering from swim-bladder trouble in shallow water for several weeks before a cure is effected.

**A few days after setting up my new aquarium with plants and fishes I noticed that the water had turned green. I emptied a lot of it away and refilled with fresh. After a day or two the discoloration was as bad as before. I just cannot get the water clear. What has gone wrong?**

Your aquarium has been taken over by microscopical plants called free-swimming algae. The more often you remove the green water and add fresh to the tank the faster the tiny plants will multiply. The thing to do is to soften the light inside the aquarium by introducing floating plants such as *Riccia* or duckweed, and extra submerged plants along the back, middle and ends. Feed the fish on live food rather than dried food, and siphon the bottom well to remove all debris. With a little less light, and extra plants to compete for the nutrients in the water, the green algae should die down within a short time of its own accord.

**I have been told by an aquarist friend that the grit sold for poultry is unsuitable for bedding the bottom of an aquarium. Can you give me the reason why?**

Poultry grit is calcareous by nature to promote the formation of strong-shelled eggs. Used as a compost in the aquarium, the lime in it soon renders the water too alkaline for successful fish-keeping.

**Is it possible to cross mate a *Colisa lalia* male with a *C. labiosa* female?**

Yes, this cross has been made several times in this country and abroad, but as far as I can ascertain the few fry raised to maturity have always proved infertile.

I have made an angle-iron aquarium frame 48 in. by 15 in. by 12 in. I have also welded a strengthening bar across the middle of the base. Do you think 1/2 inch plate glass will prove sufficiently strong for the bottom?

Quarter-inch plate glass will prove quite suitable for the bottom, but see that the part that rests on the middle bar is properly cushioned by a thin layer of cement.

We are going to repaint the woodwork in our living room and wonder whether we should dismantle our tropical aquarium and house the fish in another room while decorations are going on.

The safest thing to do is to remove the fish to another room. But if it is just an ordinary repainting without burning off, then the fish should not come to any harm if you seal between the cover glass and the top of the aquarium frame with several thicknesses of moistened newspapers. And spread newspaper over the aquarium to guard against paint spots. Keep the room well ventilated while painting is going on, and use a quick-drying paint so that the smell does not hang about longer than necessary. Give the fish a good feed of live food before you begin operations and, if artificial aeration is used, switch the aerator off to preclude paint fumes being pumped into the water.

I should be much obliged if you could give me some information on the habits and requirements of *Ophiocottus obsoletus*.

This fish, commonly called the snakehead, likes some retiring places behind rockwork, or in dense clumps of vegetation. A small specimen can be accommodated in a community tank, but as it grows it should have companions of about its own size. In the wild state, *O. obsoletus* lives

on insects, worms and any small fish that comes its way. In captivity it can be trained to accept pieces of lean meat. A temperature in the neighbourhood of 75°F (24°C) is necessary. It can endure polluted water for quite a while because it has an accessory breathing apparatus which enables it to breathe air.

Please tell me something about the spawning habits of *Osteochilichthys affinis*.

All we can tell you about the breeding habits of this species is that the female presses her sticky eggs on flat-leaved plants or smooth-surfaced rockwork, and neither she nor her spouse takes any more notice of them. At a temperature of 75°F (24°C) the eggs hatch within a few days, and the fry drop down on to the bottom and there lose themselves in drifts of sediment, or among the crowns of the plants. The fry need mossy algae, infusorians, micro worms and so on as first foods.

Is the Malayan angel fish easy to keep, and can it be bred in the home aquarium?

The Malayan angel fish (*Monodactylus argenteus*) usually settles down very well in captivity and lives a long time. It will eat almost anything, but needs green food such as duckweed and chopped lettuce in its diet. In fact, it is so fond of greenstuff that large specimens will soon clear a tank of most of the plants. Among its essential requirements are plenty of swimming space in well-aerated water. The usual tropical temperatures suit it. It has not been bred in captivity.

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

I have six 2 inch goldfish in a tank 18 in. by 12 in. by 10 in. The fish have been looking sick with their fins down and they are losing colour, and to-day one has died. They are fed on dried food. What do you think is wrong?

The fish are overcrowded. The limit for the tank is 7 1/2 inches of fish. Once you try to keep too many in a tank trouble is sure to occur. Cut down the number of fish and reduce the amount of food for a time. Try to encourage the growth of the water plants and the fish should improve in health.

I have kept one female goldfish alone in a tank with no sand, water plants or other accessories for 2 years. I have now decided to get another goldfish and add sand and plants to my tank. Do you think this is a good idea?

It depends on the size of the tank. Each inch of fish needs 24 square inches of surface area. A fish by itself will keep quite well and there is no need to give it company. The plants will not only improve the look of the tank but assist in keeping the water in a good condition.

When in Scotland I was searching a stream and caught a tiny transparent fish like an eel. If this is an eel, can I keep it in a tank and what shall I feed it on?

The fish is probably an elver, a young eel that had newly entered the stream from the sea. It can be kept but is not likely to be in evidence during the daytime. It may burrow into the sand and only feed at night. Young eels can be fed on *Tubifex*, white worms and other small forms of live food. Later it can take garden worms.

I have two common toads, one about 3 inches long and the other a little smaller. They are in a large tank of earth and gravel with a small pond. Until recently they have been quiet but now I have heard them croak and found them joining in the water. Will they breed and shall I give them a larger tank?

You may have a true pair of toads and if so they should breed. The females are very plump at spring time and

the males are much smaller. In adult toads the female is almost twice as big as the male. The latter is also more bony looking with a more pronounced humped backbone. I have known two males join up at the breeding time but never two females. There should be plenty of water for them to spawn and water weeds to hold the eggs. The eggs are laid in a double string, looking like necklaces.

One of my orandas and a veiltail seem to have swimming bladder trouble. They lie on the bottom and if they do swim at all soon revert to an upside down position on the bottom. What is the cause and cure?

Sometimes these types of fish suffer from swim-bladder trouble during the winter. I think that it is often caused in females when the previous year has not been a good one for spawning; the eggs remain in the body and so constrict the swim-bladder. The cold also seems to have a bad effect on these short-bodied fishes. It is possible that as the water warms up in the spring the fish will return to normal, especially if they can lay their eggs. Do not give any dried foods, and only as much live food as can be soon cleared up. Keep the fish in shallow water and if it can be warmed up a little it will help to get the fish right again.

Last August I made a pond with a waterfall. I filled the cracks in the waterfall stones with cement and had zinc pipes and filters for the water supply. I lined the pond with some plasticine. I waited some time after introducing the plants before adding the fishes. After a month all the fishes had died with fungus. Where do you think I went wrong? Was the trouble caused by adding three carp and a large tench which I had caught?

I do not know if there was anything harmful to fishes on the zinc pipes, but the added fishes could have caused the trouble. I have known coarse fishes which have been put in a garden pond to contract fungus. This is probably because some of their mucous covering, their protection, has been deranged and so they are easy prey for the spores

of fungus. New zinc could be harmful. I suggest that you allow the pond to stand for a week or two filled with water and wash out and then refill before adding any more fishes.

Could I grow arum lilies in my outdoor pond? It is 10 feet by 9 feet. I saw some lilies whilst on holiday last year and would like to try them.

You could certainly grow an arum lily (*Zantedeschia aethiopica*) in your pond but the trouble will be to get it through the winter safely, especially one as severe as that of 1962-63. However, you could plant one or two in pots or containers and then remove them from the pond in late autumn to a frost-proof place. They could then be dried off and returned to the pond in the spring. In a normal winter the bulbs would probably survive in the pond if they had a covering of water at least a foot deep. A fairly rich potting mixture is required by these lilies.

During a cold spell my friend's pool was covered with ice and snow. He wanted to find out how his fish were faring so he managed to get a hole through the ice only to discover that there was no water left; it had all drained away through cracks. The goldfish were lying on their sides on the wet sand and he thought they were dead. However, he saw a slight movement and so poured some water in the pond. Soon all the fish were swimming about normally. Can you account for this happening, as it would be a coincidence if he got to the pond just as the last of the water had drained away?

The reason why the goldfish were still alive after the water had drained away was that when very cold goldfish are very inactive and their body metabolism is lessened considerably. As long as their gills remained damp they could survive. It is possible that the fish could remain alive for some time under these conditions as the covering of ice would prevent a rapid drying of the gills. I think that the owner was fortunate to find the fish soon after the last of the water had disappeared.

I have two coldwater catfish and cannot tell the difference in the sexes. Can you help please?

It is very difficult to tell the sex of many of the egg-laying species of fishes. There are no external features by which an amateur could sex them. When they are examined during the breeding season it will be found that the female has a much thicker belly than the male fish. This swelling usually comes up in a sharp curve towards the vent. Catfish reach a very large size and so may not breed until they have reached this.

I wish to make a pond in my garden, using the normal methods and materials. My problem is that I live in N. Rhodesia, and the bye-laws prevent me from leaving the water without fish because of the mosquitoes breeding there. I am wondering how I can condition the pool in the shortest possible period?

You would be able to put fishes in your pond about 7 days after making. Whilst the concrete is drying spray it often to prevent too quick a drying out. When it is dry enough to hold water, say after 3 days, fill with water, scrub round with a stiff broom and empty. Do this for 3 consecutive days and then the pond will be safe for fishes when filled. The extent to which free lime is likely to get into the water in harmful concentrations depends on the volume of water. The deeper and wider the pond the less will be the concentration.

I wish to commence keeping coldwater fish and have a large basement, 18 feet by 12 feet, which I could utilise. The trouble might be that there are only two quite small windows. How much artificial light is necessary to keep fish and plants healthy?

You would be able to keep coldwater fishes in your basement quite safely. These fishes do not need a lot of light and some water plants will grow well under the same conditions. You could have two 25 watt lamps over each tank of 2 feet length and you will find that hornwort

(*Ceratophyllum demersum*) will grow quite well with very little light. The lamps could be switched on for a few hours each day and experiments will soon show for how long they are needed to keep the occupants of the tanks healthy.

I would like to breed a fancy variety of goldfish. Would moors be suitable and if so what age and size would they need to be before breeding?

You could breed moors and I suggest that fantail moors would be better than veiltail moors for a start. The fish should be at least 2 years old, although it is possible to breed from them when a year old provided that they have been well reared and have a body length of at least 1½ inches.

I am rather worried about the proposals to add fluoride to tap water. Is it poisonous to fish and plants?

The addition of fluoride to drinking water would have no harmful effects on your plants or fishes. This chemical is found in most natural waters which contain fish.

Why is it that goldfish with three tails are not included in the Federation standards?

The fish you mention have the lower half of the tail double and the top half single. They are known as tri-tails. They are the throw-outs from double-tailed strains and as such are of no value at all. If standards were to be made for all the possible misshapen goldfish bred from double-tailed strains there would be no end to them and necessity of breeding distinct true strains would cease.

I bought a moor which soon developed some white spots on it. I was advised that it was white spot disease but the suggested remedy did not effect a cure. I can brush off the white with a soft camel hair brush, but after a time some more appears on the fish. What is the cause and cure please?

It is not white spot disease, as you would not be able to wipe this from a fish. The parasite causing this disease gets under the skin of a fish. The trouble is probably *Oodinium*, or velvet disease. This is caused by a tiny parasite and can be cured by immersing the fish in a salt bath, one heaped tablespoonful to a gallon of water. Leave in for a few days and then reduce the strength of the solution gradually either by adding fresh water or changing it entirely.

Is it possible to clear floating weed from a lily pool by adding either copper sulphate or a selective weed killer?

The floating weed is probably blanket weed, a form of alga, and it is a plant. What would be likely to kill this would also kill all the other plants in the pool, as well as the fish. Much of the weed can be raked out and if a broken stick is twisted into it much more can be pulled out. The removal of a quantity of it will allow the other plants to grow stronger and choke it out.

I have a polythene pond (11 feet by 8 feet) in my garden, in which I wish to breed fish for selling. Can I mix the breeds; which kinds do you suggest will be best, as I want to breed and rear in the pond until the young fish are of a size suitable for selling?

To breed any variety of goldfish in your pond you can have only one kind as all types of goldfish will inter-breed. Their progeny would then be useless for sale. You could try with common goldfish, comets, shubunkins or scaled fantails. These fish are hardy enough to stand an ordinary winter out of doors. You are not likely to get many youngsters to selling size in your pond unless you have plenty of cover in the form of fine-leaved water plants, as the parent fish may eat the eggs and fry. Do not expect to make your fortune with your project; even very experienced aquarists have a job to do this and most breed only as a hobby.

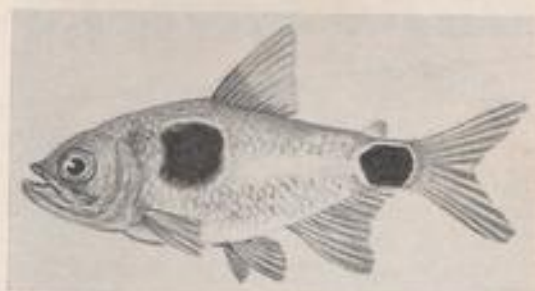
## A Rarer Characin—*Exodon paradoxus*

THIS exceedingly handsome species was first introduced to tropical aquarists in 1935, but because of its reluctance to breed freely in captivity, and the ease with which it is said to elude capture in the wild, it still remains one of the rarer, and naturally more expensive, members of the family Characidae.

It is native to many of the streams and rivers of north-eastern South America, and attains a length of about 3 inches. In its smaller sizes, when it displays its brightest colours, it does no harm in a community tank, but several specimens kept together will often fight among themselves. At full size, however, it is recommended not to place it in an aquarium housing fishes much smaller than itself.

The general colour is gleaming yellowish to greenish grey, with red and violet tints and silvery reflections off the sides. There is a large black blotch just behind and above the pectorals, and another on the caudal peduncle. These distinctive markings are often ringed with yellowish white to silver. The pectoral fins are clear, but the bases of the other fins are yellow merging to red. The ventral and caudal fins are particularly well coloured. Both sexes look much alike, but in mature specimens the female is heavier-bodied than the male.

*E. paradoxus* is a very lively, shoaling fish and needs plenty of space to move around in. Seemingly it thrives best in soft, acid water, a diffused light and a temperature



*Exodon paradoxus*

in the neighbourhood of 75°F (24°C). It has a hearty appetite, and though it will accept some dried foods greedily, the bulk of its diet should consist of regular live foods such as *Daphnia* or small (or chopped) red earthworms.

In the main *E. paradoxus* is neither delicate nor short-lived. In point of fact, it has been known to live in an aquarium for as long as 10 years.

Jack Hems

## Breeding the Golden Barb

by M. J. PARRY

THE golden barb, or *Barbus schuberti* as it is more commonly called (though this name has no scientific standing), was originally bred as a natural sport (hook) from the half-banded barb (*Barbus semifasciatus*) by Mr. Thomas Schubert of Camden, New Jersey, U.S.A. It has since become very popular and is usually sought after as a fish for the "community tank".

Its popularity is justly deserved, as it is colourful, peaceful and hardy. The general body colour is a beautiful golden yellow, sparsely dotted with black markings, which tends to enhance its natural beauty. Full sized specimens attain a length of 2½ inches.

The general care and breeding of this fish is similar to that of other members of its family. Its basic requirements are clear, well matured water, preferably on the acid side, with a gravel bottom.

For breeding purposes a well matched pair of fish should be selected, both in size and temperament. The female can be recognised by her plumper appearance, and the lack of black markings found in the male. The male, once in breeding condition, can be easily recognised, as his fins now become a glowing red, and the normally silver belly is accentuated into bright red coloration.

The fish should be separated and conditioned for 10 days on vast amounts of white worms, *Daphnia* and, if possible, chopped earthworms. The breeding tank, which if possible should not be less than 18 in. by 10 in. by 10 in., should be set up so as to include neutral or preferably acid water, pH 6.8—7.2. Temperature should be set at 80°F (27°C). Two spawning mops made from woollen waste should be floated in opposite corners of the tank, in which the fish may spawn.

The female should be introduced late in the evening, followed some 10 minutes later by the male. With luck spawning should commence early the next morning. This commences with vigorous driving by the male, and terminates with both fish hovering around the mop, with fins extended, and the female expelling her eggs, which are immediately fertilised by the male. Spawning continues for a further hour, after which both parents should be removed.

After 2 days the fry will have become free-swimming, and after emerging from the mop they should be provided with the normal fry foods, in the following order: Infusoria, newly hatched brine shrimp, fine dried food, sifted *Daphnia* and finally chopped *Tubifex* and white worm. By the time this last stage has been reached the fry will be 6 months old, and with luck will continue to grow into fine future breeding stock.

## Cacti in the Fish House

SEE that the cacti occupy such a position that they get all the light possible, as they mostly thrive in sunshine.

If they are constantly kept in the shade they become atypical and fail to flower. They also become attenuated and completely out of character. After a hot day the plants benefit from a light spraying with water, especially the *Epiphyllum*, which like the conditions found in the tropical forests of Brazil.

## 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 Butts, Half Acre, Brentford, Middlesex

### A Show Mourned

HAVING read Mr. Cooke's letter in your March issue I feel that I must enter the lists on this subject. I have read Mr. Marshall's first letter a number of times but am unable to agree with Mr. Cooke's statement in the first paragraph of his letter, namely that Mr. Marshall implies that only a London show is a national show, or that the British Aquarists' Festival is not truly representative.

If Mr. Cooke reads Mr. Marshall's letter he will see that the term "National" was an affectionate term given to the annual N.A.S. Show. Later Mr. Marshall goes on to say: "I ask all aquarists who feel that we should once again have a truly representative and National Exhibition to write to the Editor of *The Aquarist*". In point of fact the question of "staging a large show in London" is an Editorial comment and not Mr. Marshall's.

There appears to be one point that Mr. Cooke has overlooked, namely that the "National" was an Open Show whereas, to quote Mr. Cooke's own words: "The B.A.F. is a show open to any member of any Society throughout the world". In other words it is, by Mr. Cooke's own statement, an international "closed shop" show limited to members of aquarists' societies only. Consequently the man who owns one or two tanks and who through force of circumstances is unable to join a Society is barred from making any entries in the B.A.F., even if he was the only person in the country to own a certain species of fish.

Another point that strikes me is the suggestion that to help the promoters of any future National Show, exhibitors should supply their own tanks. Whilst the suggestion has a certain amount of merit, I do feel that ultimately it might defeat its own ends. First let us consider the aquarist who is willing to make, say, four individual entries. He could possibly accommodate the fish comfortably in two containers for travelling purposes, but if he has, in addition to carrying his fish, to bring along the tanks to accommodate them, he might well find it necessary to reduce the number of his entries.

His reasons could be twofold at least. Taking the estimated cost of the tanks as quoted by Mr. Stevens of Hendon and District Aquatic Society at 5s. per tank, there is £1 outlay plus the cost of each entry.

Again there are certain cities whose bye-laws prohibit the carrying of glass on public service vehicles, thus pushing the potential bus-travelling competitor into other means of transport of a more expensive nature, unless of course some kind friend does the carrying for him. These are only two of a number of snags I can visualise.

I would at this point like to state categorically that the opinions expressed above are purely personal and are not intended to be an expression of the ideas of the Society of which I have the honour of being a member.

To underline the points of my remarks I would say that the Nottingham and District Aquarist Society are holding a 2-day Open National Show on Saturday and Sunday 12th and 13th September this year, and the Society is supplying the following sized tanks: 12 in. by 6 in. by 6 in. and 16 in. by 10 in. by 10 in. Also, a number of 18 in. by 10 in. by 10 in. will be available. Only one group of exhibitors will be asked to supply their own tanks, namely in the Society Furnished Aquaria class, where the size required will be 24 in. by 15 in. by 12 in.

H. WALKER, *Chairman*, Nottingham  
and District Aquarists' Society.

IN reply to the letter by Mr. Cooke in the March issue of *The Aquarist* regarding national open shows, he rather misses the point in competitive shows, as I, along with others, at the F.N.A.S. assembly last February pointed out. The B.A.F. at Belle Vue is for Society entry only. Outside individuals who have no society attachments cannot compete, as entry is in bulk on a Society stand in an allotted space.

Because of this ruling, we in Nottingham decided to offer the facilities the B.A.F. does not cater for, in our Show this year. We are making arrangements to receive up to 800 entries in three sizes of aquaria.

I feel sure that the Nottingham Society's approach to this problem is right, and one must always bear in mind that it is the aquarists' wishes that must be catered for if any competition is to succeed. This is our reason for holding our show on Saturday and Sunday, leaving Friday for acceptance of entries, instead of using Friday as another day for visitors as we originally planned. The point being again that the competitor has until 9 p.m. on Friday, after finishing work, to bring his fish for benching instead of losing time from work to journey to the show with his entries mid-week.

If Mr. Cooke will examine these facts I think he must agree that the Show we are going to stage is a National Open Show catering for every individual in the hobby.

W. J. CHRISTIAN,  
*Show Secretary*, Nottingham and  
District Aquarists' Society.



### Native Spatterdocks

IN a past issue of *The Aquarist* a contributor wrote about freaks of nature in the botanical world and also described odd behaviour of one of his spatterdocks which had floating leaves of a different character from the submerged type. I would like to point out that this is perfectly normal behaviour for this species. Both *Nuphar lutea* and *Nuphar pumillum* are really yellow water lilies; it is only in aquaria where they do not have sufficient nutriment and light, that they do not reach the surface and so have no floating leaves. This is a good thing for aquarists, I may add, as the under-water foliage is far superior to the floating foliage. In fact our aquarium spatterdocks are only half-grown water lilies. *Nuphar lutea* is a common plant in lakes, canals etc. Although *Nuphar pumillum* is far more rare in this country, I have seen this plant growing in a Shropshire lake, just like all other water lilies, with floating leaves and small yellow flowers.

K. A. DAVIES,  
Penyffordd, nr. Chester.

## Mr. Edgar Chapman

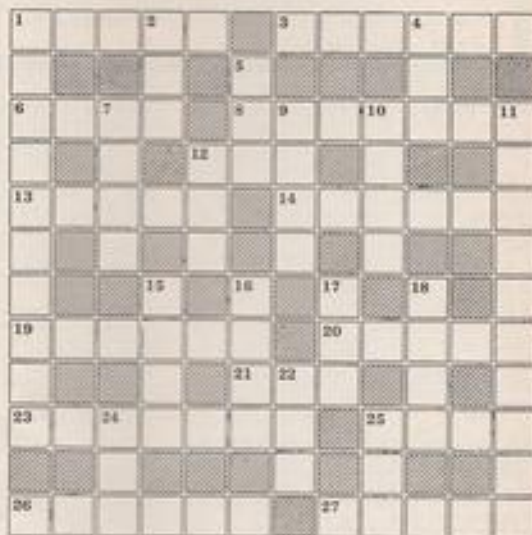


IT is with regret that we announce the death of Mr. Edgar Chapman at his home in Sheffield last month after a short illness. Mr. Chapman was 70 years of age. An aquarist for most of his life, he was a founder member of the Federation of Northern Aquarium Societies and its first vice-president. Before the last World War his main interest was in fancy coldwater fishes, but he later widened his interest to include tropical fishes. He was in great demand as a judge and travelled hundreds of miles annually obliging aquarists' societies in this capacity. His home city Society, Sheffield A.S., enjoyed his guidance and he has served it in several official capacities over the years. Since the first British Aquarists' Festival in 1951 Edgar Chapman, and Mrs. Chapman, never failed to devote many days and nights working to make each new B.A.F. a success. He will be sadly missed by the aquarium hobby and all who knew him. Our deepest sympathy is extended to his widow and son.

May, 1964

## The AQUARIST Crossword

Compiled by M. W. SAUNDERS



### SPECIAL CLUE

1 across, 5 down, 14, 19, 20, 23, 26 across. *The Aquarist's* motto (5, 3, 6, 2, 4, 2, 3, 5, 2, 6).

### CLUES ACROSS

- |  |   |
|--|---|
| 1. See special clue.                           | 14. See special clue.   |
| 3. A type of swamp plant (6).                  | 19. See special clue.   |
| 6. Type of fit possessed by some molluscs (4). | 20. See special clue.   |
| 8. Tree has all-round warmth provided (7).     | 21. Charge the sheep! (3).                                    |
| 12. Dead and red are two examples of it (3).   | 23. See special clue.   |
| 13. Sluggish and entirely round, almost (5).   | 25. A persistent one may cause the aquarist some concern (4). |
|  | 26. See special clue.   |
|  | 27. Species of pigeons with frilled collars (5).              |

### CLUES DOWN

- |   |  |
|---|--|
| 1. Removing by the use of water (7, 3).             | 12. Without the French style, it's a home (3).   |
| 2. He's a slippery character (3).                   | 15. The measure of a fish's breathing organ (4). |
| 4. Alone, without the gunman (3).                   | 16. Nothing (4).                                 |
| 5. See special clue.                                | 17. My French friend's plan—to get around (3).   |
| 7. Just a thought (4).                              | 18. — or ruffe (4).                              |
| 9. I teach every single one without it (4).         | 22. Aft, where you won't find the steerman (5).  |
| 10. Accessory for breeding that is part round (4).  | 24. Consume (3).                                 |
| 11. A handsome group of surface-feeding ducks (10). | 25. Large member of the Cyprinidae family (3).   |

Solution on page 37

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 Bedford and District A.S.** were recently hosts to the Dunstable and District A.S. who were paying a return visit to hold an inter-society table show. Having been beaten at home, Dunstable tried hard to win the return but narrowly failed by eleven points to nine. Congratulations to Mrs. D. Bell whose fish were first and second in the labyrinth class and to R. Thompson second and fourth in the egg-laying toothcarp etc. class.

The first club table show of the year was held on the same evening. This was also for two classes and in the livebearer class the results were: 1, Mrs. D. Bell (mollie); 2, A. Sanderson (sword); 3, W. Donnelly (guppy); 4, J. Wells (Platy). In the cichlid class: 1, Mrs. D. Bell (blue scara); 2, R. Thompson (rasterfish); 3, D. Angel (severum); 4, K. Sanderhouse (jewel). The judge was Mr. N. Mason-Smith, F.Z.S. During the judging, W. Donnelly gave a full report on the F.I.A.S. quarterly meeting.

**THE annual general meeting of the Hastings and Bexhill A.S.** was held recently. The hon. secretary, Mr. A. McCormick, reported that the year had on the whole been very successful. Although the average attendance at meetings was slightly lower than the previous year, membership was steadily increasing. The election of club officers, resulted as follows: Chairman, Mr. P. Sleet; vice-chairman, Mr. W. R. Smith; hon. secretary, Mr. A. McCormick; asst. hon. secretary, Miss V. Rogers; hon. treasurer, Mrs. P. Martin. Committee, Mr. P. Martin and Mr. R. Lamb. F.I.A.S. delegate, Mr. P. Sleet; hon. show secretary, Mr. J. Santer.

Miss P. Ball was then asked to present the prizes which were won as follows: Member of the Year Trophy, Mr. J. Santer; Home Aquaria Trophy, Mr. C. George; Singapore Bowl, Mr. J. Santer; Any Other Variety Trophy, Mr. E. Nye; Scavenger Plaque, Mr. A. McCormick; Livebearer Plaque, Mrs. Saezer; Labyrinth Plaque, Mr. P. Martin; Miniature Aquaria Plaque, Mr. A. McCormick.

**THE East Dulwich A.S.** held their annual general meeting recently, and the following officers were elected: Chairman, Mr. G. Gale; secretary, Mr. A. Gale, 16, Chesterfield Grove, East Dulwich, London, S.E.22; treasurer and social secretary, Mr. G. Brown; minute and publicity secretary, Mr. J. Stringer. Committee: Mr. A. Blyth, Mr. H. Aves, Mr. H. Hill, Mr. J. Spooner. Show secretary, Mr. R. Salmon; Assistant Show Secretaries, Messrs. G. Jenkins and J. Stringer. Awards for the year were as follows:—Championship Cup, A. Blyth; Highest Pointed Fish of the Year, Ron Salmon; rambora, G. Gale; cichlids, G. Gale; toothcarps, G. Jenkins; labyrinths, R. Salmon; guppies, Mr. Rutter; mollies, plays and barbs, Mr. A. Blyth; danios, J. Stringer; cats, C. Smith; brood show, H. Aves; cold-water, J. Roberts; plants, C. T. Smith. Meetings are held at 97, Barry Road, East Dulwich, S.E.22, every Monday at 8 p.m. and all newcomers are welcomed. This Club is now a member of A.S.L.A.S.

**THE April meeting of the South Wales and Monmouthshire Characin Society** took the form of a talk by the chairman, Mr. R. Dennis

John, on the breeding of the glowlight tetra. He explained in detail the various spawning procedures, and drew interest on the fact that he had used water straight from the tap, at approximately 5% of hardness.

The rest of a very enjoyable evening was taken up with Society business, and a discussion on the various aspects of judging and showing fish.

Once again the unbroken run of new members was extended, with the enrolment of one new member, Mr. Roy Cuddeat. Raffle prizes were won by Mr. S. Starr, Mrs. A. James, and Mr. J. E. Barwin.

An open invitation is again extended to any interested aquarist in the area, and they are asked to contact the hon. secretary, Mr. M. J. Parry, 45, Western Drive, Gabafta, Cardiff (tel. 66573).

**THE results at the annual open show of the Belle Vue (M.C.) A.S.** were as follows: Best in show, Mr. A. Bloom (Salford); Best breeders entry, Messrs. Buresford and Jeffries (Fancy Guppy Association). Livebearers: 1, Mr. R. Griffiths (Fancy Guppy Association); 2, Mr. Greenwood (Oldham); 3, Mr. A. Hickson (Belle Vue). Dwarf cichlids: 1, Mr. Ainsworth (Belle Vue); 2, Mr. Bowden (Belle Vue); 3, Mr. Walker (Oldham). A.O.V. cichlids: 1, Mr. Galloway (Sheffield); 2, Mr. C. Bridges (Belle Vue); 3, Mr. Wilke (Stretford). Fighters: 1, Mr. Galloway (Sheffield); 2, Mr. Ramsdale (Lancashire Aquarists); 3, Mr. Bloom (Salford). Assassins: 1, Mr. Bloom (Salford); 2, Mr. Galloway (Sheffield); 3, Mr. Smith (Stretford). Small barbs: 1, Mr. Gregory (Oram); 2, Mr. Hudson (Sheffield); 3, Mr. Gregory (Oram). Large barbs: 1, Mr. Collins (Oram); 2, Mr. Chilton (Stretford); 3, Mr. Chilton (Stretford). Small characins: 1, Mr. Collins (Oram); 2, Mr. Ainsworth (Belle Vue); 3, Mr. Wilson (Macclesfield). Large characins: Mr. Tweedy (Oldham); 2, Mr. Walker (Oldham); 3, Mr. Nichols (Oram). Carps and minnows: 1, Mr. Collins (Oram); 2, Mr. Coulton (Sheffield); 3, Mr. Wilbraham (Oram). Killifish, toothcarps, rambora and danios: 1, Mr. Wilbraham (Oram); 2, Mr. Craon (Sheffield); 3, Mr. Williamson (Salford). Catfish: 1, Mr. Gill (Belle Vue); 2, Mr. Greenwood (Oldham); 3, Mr. W. H. Smith (Stretford). Loaches and eels: 1, Mr. Chilton (Stretford); 2, Mr. Bell (Belle Vue); 3, Mr. Walker (Belle Vue). Breeders (livebearers): Messrs. Buresford and Jeffries (Fancy Guppy Association); 2, Mr. Bradley (Macclesfield); 3, Mr. Shore (Oram). Breeders (egg-layers): 1, Mr. Turner (Ashton); 2, Mr. Coulton (Sheffield); 3, Mr. Shore (Oram). A.O.V.: 1, Mr. Greenwood (Oldham); 2, Mr. Campbell (Fancy Guppy Association); 3, Mr. Shore (Oram). Juniors: 1, Master Gordon (Stretford); 2, Master A. Leake (Belle Vue); 3, Master A. Leake (Belle Vue). Goldfish: Mr. Boxer (Northern Pondkeepers); 2, Mr. W. H. Smith (Stretford); 3, Mr. W. H. Smith (Stretford).

The society secretary, Mrs. C. Kelly would like to thank all the societies who supported the show so well.

**THE annual general meeting of the Perth A.S.** was held recently when a good attendance of members elected the following office-bearers:—Hon. president, Ex-Lord Provost John Buchan;

hon. vice-presidents, Messrs. J. Barr, W. Davidson and Doctor McDonald; president, J. Netherington; vice-president, H. Reekie; secretary, A. B. Dewar, "Isle Villa," 47, Craigie Road, Perth; treasurer, J. Henderson; Committee: Messrs. Netherington, Reekie, Dewar, Henderson, McFarlane, Kerr and Clark. Auditors, Messrs. J. McCabe and W. Dawson; curator, R. McFarlane; publicity and Newsletter editor, A. B. Dewar; representative to F.S.A.S., H. Reekie.

The change of name from Perth Aquarist Club to be noted and new members would be welcome. Further information regarding the Society can be obtained from the secretary. Visitors to Perth are invited to view tanks of fish maintained in Perth Art Gallery, George Street, by the Society.

**IN the third round of the Aquarist Inter-Society Show League, Coventry, the Leamington and District A.S. again drew level with Coventry A.S. with 44 points.** Atherton lead with 49 points and Rugby have 37 points. The fourth deciding round is to be held at Leamington A.S. for the coldwater and A.O.V. trophies.

**Table show results:** Guppies: 1, B. Mann, Coventry (triangle tail); 2, H. E. Jones, Atherton (veil tail); 3, E. Mills, Atherton. Any other variety: 1 and 3, E. P. Harris, Leamington (marigold plays); 2, L. Blower, Leamington (black swordtail). Breeders' class: 1, R. Deacon, Rugby (sunset plays); 2, J. Grant, Coventry (red wagtail plays); 3, Mrs. H. Court, Coventry (syrnet mollies).

**MUCH practical advice and information on the growing of aquarium plants and the breeding of really good guppies** was given to members of **Berwinst Aquarist Club** by Dr. Clifford Cole, of Birmingham, when he addressed the April meeting. "One of the best talks yet heard in Derby," was the opinion of all present and Dr. Cole was thanked by Mr. A. Adley, assistant secretary, Mr. S. Yeomans (chairman of the club) presided.

**THE results of the open show of the Stretford & District A.S.** were as follows: Coldwater: 1, Mr. Ogen (Urmston); 2, Mr. W. H. Smith (Stretford); 3, Mr. W. H. Smith (Stretford). Guppies: 1, Mr. Griffiths (F.G.A.); 2, Mr. Hickson (Belle Vue); 3, Mr. Griffiths (F.G.A.). Mollies: 1, Mr. W. H. Smith (Stretford); 2, Mr. Wilshaw (Lancs. Aquarists); 3, Mr. W. H. Smith (Stretford). Swordtails: 1, Mr. Parks (Merseyside); 2, Mr. Turner (Merseyside); 3, Mr. Lewis (Burnley). Platies: 1, Mr. Thompson (Merseyside); 2, Mr. Holden (Urmston); 3, Mr. Holden (Urmston). Dwarf cichlids: 1, Mr. Lewis (Burnley); 2, Mr. Ainsworth (Belle Vue); 3, Mr. Lewis (Burnley). A.O.V. cichlids: 1, Mr. Mills (Merseyside); 2, Mr. Lewis (Burnley); 3, Miss Collins (Merseyside). Fighters: 1, Mr. Thomalla (Merseyside); 2, Mr. Ramsdale (Lancs. Aquarists); 3, Mr. Nightingale (Belle Vue). Assassins: 1, Mr. Hughes (Belle Vue); 2, Mr. W. H. Smith (Stretford); 3, Mr. Gregory (Oram). Small barbs: 1, Mr. Gregory (Oram); 2, Mr. Gregory (Oram); 3, Mr. H. T. Stanger (Merseyside). Large barbs: 1, Mr. Chilton (Stretford); 2, Mr. Parks (Merseyside); 3, Mr. Pillinger (Merseyside). Characins (large and small): 1, Mr. Pillinger (Merseyside); 2, Mr. Poole (Merseyside); 3, Mr. H. T. Stanger (Merseyside). Carps and minnows: 1, Mr. Wilbraham (Oram); 2, Mr. Swanson (Merseyside); 3, Mr. Ingham (Accrington). Catfish: 1, Mr. E. Stanger (Merseyside); 2, Mr. W. H. Smith (Stretford); 3, Mr. North (Stretford). Loaches: 1, Mr. Chilton (Stretford); 2, Mr. Chilton (Stretford); 3, Mr. W. H. Smith (Stretford). Sharks: 1, Mr. Wilbraham (Oram); 2, Mr. Parks (Merseyside); 3, Mr. McConville (Merseyside). Breeders (livebearers): 1, Mr. Griffiths (F.G.A.); 2, Mr. Griffiths (F.G.A.); 3, Mr. Holden (Urmston). Breeders (egg-layers): 1, Mr. Ingham (Accrington); 2, Mr. Wilbraham (Oram); 3, Mr. Ingham (Accrington). A.O.V.: 1, Mr. McConville (Merseyside); 2, Mr. Wales (Stretford); 3, Mr. Wales (Stretford). Juniors

A.O.V.: 1, Master Parks (Merseyside); 2, Master Gardner (Stretford); 3, Master Walker (Down). Best fish in show: Mr. Pillingier (Merseyside) with a piranha.

There were almost 200 fish on show (a record for a Stretford show). The Liverpool society gained the most points with 41 and Stretford were second with 25.

THE Midland Association Annual Convention, a probable treasure hunt and visits to London and Plymouth are a few of the items that have been or will be, keeping members of the Fort Dunlop A.S. fully occupied during this year.

Weather permitting, the committee will be organising an aquarist treasure hunt during a summer weekend, when it is hoped to improve knowledge of natural life in a practical, interesting way.

On Saturday, 13th June, members, relatives and friends will be travelling to London for the day. The aquarist contingent will be visiting Regent's Park Zoo and Midlanders from other societies are invited to apply for the few seats remaining. Previous excursions have proved to be very popular and strangers can be assured of a warm welcome to a happy passenger list. In September, the Society are involved with a more ambitious undertaking—a visit to the renowned Plymouth Aquarium. This excursion will involve an overnight stay in the city and officials have been pleasantly surprised at the heavy bookings for the trip.

Meanwhile, aquarists from other Dunlop societies in the country (or the world for that matter) are invited to get in touch with P.D.A.S. with a view to setting up useful, mutual contacts through the medium of the club magazine. All enquiries to be addressed to the secretary, Alan McDonald, Physical Research Section, Research Centre, Fort Dunlop, Erdington, Birmingham, 24.

THE annual show of Portsmouth A.S. will be held 31st August-3th September as follows: Entries to be benched on 29th August. Schedules obtainable from Show Manager, Mr. W. Hyder, 493 Commercial Road, Portsmouth, Hants. The new secretary is M. Fors, 108 Cuthbert Road, Fratton, Portsmouth.

RECENTLY Hull A.S. held its first evening league match. The clubs competing in the league are the same as last year; Den Valley, Gouls, Hull and Thorne, and the first match was against Thorne, at home.

There were 136 entries and Hull won a close match by 44 points to 33 points.

The individual results were—Livebearers: 1, golden swordtail, Mr. Peacock (H); 2, swordtail, Mr. Peacock (H); 3, platy, Mr. Shepherdson (H). Characins: 1, bloodfin, Mr. Sweeting (T); 2, marginatus, Mr. Chapman (H); 3, salmon discus, Mr. Galetus (T). Toothcarps: 1, yellow gularia, Mr. Clark (T); 2, tinnoyas, Mr. Machin (T); 3, rivulus, Mr. Gabetus (T). Cichlids: 1, severum, Mr. Reveley (H); 2, angel, Mr. Sweeting (T); 3, blue acara, Mr. Robinson (H). Danios, ramboras and minnows: 1, silver tail, Mr. Sweeting (T); 2, harlequin, Mr. Chapman (H); 3, rambora elegans, Mr. Gabetus (T). Anabantids: 1, combtail, Mr. Ridyard (T); 2, thudley, Mr. Hall (H); 3, snakeskin, Mr. Boney (H). Fighters: 1, blue, Mr. Robinson (H); 2, red, Mr. Storey (H); 3, blue, Mr. Hall (H). Barbs: 1, ticto, Mr. Gibson (H); 2, over-lipped, Mr. Machin (T); 3, ticto, Mr. Reveley (H). Cats and loaches: 1, corydoras aeneus, Mr. Shepherdson (H); 2, marble loach, Mr. Gray (T); 3, corydoras rabisoni, Mr. Bawell (H). Breeders: egg-layers: 1, parichax clayfar, Mr. Wells (T); 2, combtails, Mr. Clark (T); 3, feremonths, Mr. Wells (T). Livebearers: 1, swordtails, Mr. Wells (T); 2, guppies, Mr. Peacock (H); 3, platys, Mr. Rumbottom (H). A.O.V. and sleeper goby: Mr. Reveley (H); 2, golden orfe, Mr. Malcolmson (H); 3, redtail black shark, Mr. Machin (T). Best fish in show: severum, Mr. Reveley (H).

Visitors and new members are always welcome at the meetings starting 7.30 p.m. in the British Railway Institute, Anlaby Road, Hull, on the first and third Wednesday of each month.

THE Yorkshire section of the F.G.B.S. at their last meeting decided to hold a one-day show on the 23rd August at the Ambulance Hall, Skipton. Details and information can be obtained from the Secretary of the Section Mrs. D. Cherry, Furdale, Grassington, Skipton. At the last meeting on the table for judging were A.O.V. guppies, and the first three places Mr. Whitecock of Tadcaster.

THE Dagenham Town Show will be held on the 4th and 5th of July, at the Central Park, Dagenham. Schedules can be obtained from the show secretary, C. B. Berkley, 77, Bridport Avenue, London Road, Romford, Essex.

RECENT activities of the Blackpool and Fylde A.S. have included a talk given by the chairman on Siamese fighters. Members table shows results have been as follows—A.O.V. tropical or coldwater for Singleton Trophy: 1, G. Marber; 2, B. Simmonds; 3, G. Howarth. Junior section: J. Jackson. A.O.V. barbs (pairs) for Robinson Trophy: 1, B. Simmonds; 2, L. Howlett; 3, D. Briers; 4, K. Pearson. The Society's own open table show will be held on Whit-Sunday, 17th May, at 67, Station Road, Blackpool S.S. The annual open show on Sunday, 27th September, will also be held at 67, Station Road, Blackpool S.S. Meetings are still held on the first and fourth Wednesdays in each month, at the Veevers Hotel, Blackpool.

AT the last meeting of the Thorne Society Mr. L. Greenall of Tadcaster gave a talk on how he started to keep and breed toothcarps. He brought along a blue gularia which he had received from the U.S.A. as an egg by post hatched off and reared himself. The table show result for best pair was as follows: 1, Mr. G. Sweeting, red tail scissors; 2, Mr. G. Sweeting, bloodfin; 3, Mr. C. Duffield, serpa.

THE following officers were elected at the annual general meeting of the Mansfield and District A.S.: Chairman, Mr. A. Atkins; hon. secretary, Mr. R. V. Dyson, 14, Dalestorth Street, Sutton-in-Ashfield, Notts.; show secretary, Mr. R. Hawes, 36, Bonnington Road, Mansfield, Notts.; treasurer, Mr. J. Bower. Other committee members: Mr. J. Curtis, Mr. B. Heath, Mr. R. Martin.

Also included in the meeting was the table show for the "Cecil Hughes Cup," judged this year by Mr. S. Pepper. The winner, Mr. R. Martin (angel), was given a hard battle by Mr. J. Bower (flying fox). Preparations are in hand for the second open show to be held on 14th June. Schedules will be available from show secretary, Mr. R. Hawes. Meetings are held on every other Monday at the Crown Hotel, Stockwell Gate, Mansfield.

DURING April the Scottish A.S. held its annual general meeting and the following office-bearers were elected: President, Mr. Wm. O'Neill; vice-president, Mr. J. C. Paterson; hon. secretary, Mr. K. L. Brown, M.F.Ph., M.S.S.Ch., D.P.L., 21, Sundale Avenue, Clarkston, Glasgow; asst. secretary, Mr. J. Leask; hon. treasurer, Mr. E. Dick; show manager, Mr. N. McKinnon. Council, 1964-65: Dr. A. Young, Mr. R. Lothead, Mr. Humon, Mr. D. Carruth, Mr. S. Thomson, Mr. W. Connolly, Mr. G. Thomson, Mr. G. Reid; editor (magazine), Mr. S. Thomson. Federation of Scottish Aquarium Societies' delegate, Mr. J. C. Paterson. F.S.A.S. Breeders' Committee delegates: Messrs. N. Balnes and N. McKinnon. Auditors, Messrs. K. A. M. Robertson and J. Robertson.

Monthly meetings are held on the first Tuesday of each month at 534, Sauchiehall Street, Glasgow. 5th May, President's night—table show, A.O.S. tropical, coldwater, amphibia and reptiles. 2nd June, Juniors' night—"The Juniors speak out". Table show, tropical and coldwater, single adult fish owned by a senior member—any variety. Judged by the Juniors. Annual show—6th-10th October, 1964.

THE Hounslow and District A.S. were beaten by the Riverside club by 633 points to 629 in an inter-club table show held recently.

The judge was Mr. Towell who stated the standard of the fish shown by both clubs was very high, the proof of this can be seen from the result. At a recent table show for characins held at Hounslow the result was a tie for first place between Master Chris. Smith (penguin) and Mr. B. C. Boulit (salmon discus), both 82 points. Second was Mr. B. C. Boulit (black neon tetra), 80 points, and third, Mr. H. Pratt (bleeding heart tetra), 78 points. During the next few meetings, table shows for livebearers (pairs) and coldwater will be held, together with a number of outings which the committee is arranging.

RECENT meetings of the Sheffield and District A.S. have been well attended by members. Table show results: Guppies: 1, K. Topham; 2 and 3, H. Crossland. Pairs: 1, H. Crossland; 2 and 3, B. Elliot, and Any species: 1 and 3, R. B. Galloway; 2, H. Crossland.

Details of society meetings can be obtained from the secretary, R. E. Galloway, 71, Bent Lathes Avenue, Rotherham.

AT the April meeting of the Leeds and District A.S. the results of the table show were as follows: Labyrinths: 1, Mr. E. Benn; 2, Mr. D. Lees; 3, Mr. M. Redman. Live-bearer Pairs: 1, Mr. E. Benn; 2, Mr. D. Rammson; 3, Mr. M. Redman.

AT a recent meeting of the Catford A.S. it was decided to hold an open show on 27th June. It is hoped that this show will be as well or even better supported than the society's last show. Any clubs or individual aquarists who are interested in competing should apply for show schedules to: Mr. R. Sammons, 34, Sandy Ridge, Chislehurst, Kent, and any local aquarist wishing to join the above society would be welcome at the meeting place, The King Alfred School, Heilbach Road, Catford, S.E.6, or ring Hither Green 9184 for further information.

#### NEW SOCIETY

THE formation of an aquarist society has been announced from Sittingbourne. The club is known as the Sittingbourne and District A.S.

The founders were Mr. A. S. Gibson, Mr. Lee and Mr. P. J. Burton. The club meets every three weeks in the Rural Science Unit of Westlands School and the elected officers are as follows: President, Mr. A. Highton, M.A., headmaster of Westlands School; chairman, Mr. A. S. Gibson; secretary, Mr. P. J. Burton; treasurer, Mr. Lee. The boys of the school are taking a very active part in this adult venture and it is hoped that the club will flourish.

#### Crossword Solution

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

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