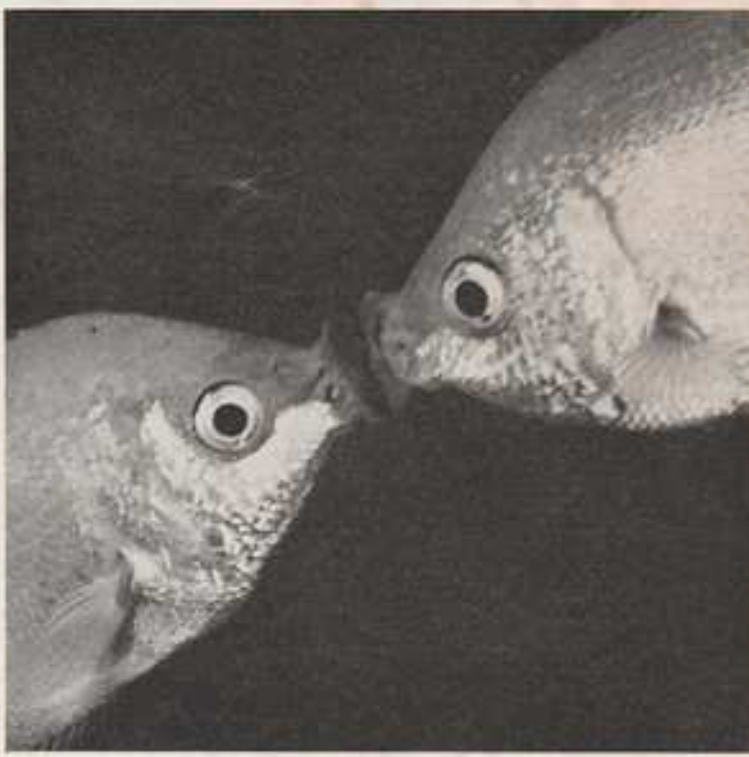


The Aquarist

and Pondkeeper

APRIL 1965



MONTHLY
Vol. XXX No. 1

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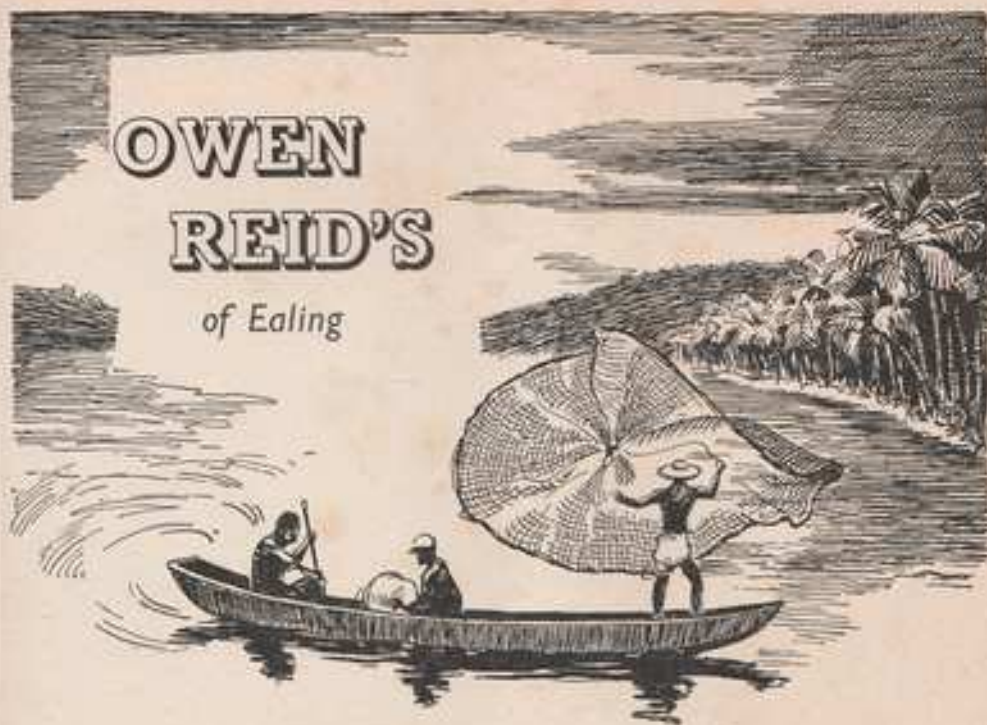
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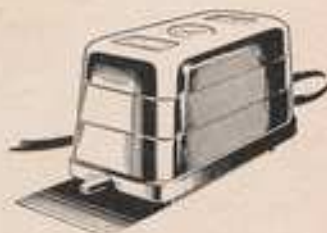
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VOL. XXX No. 1

1965

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Wanted—a London Show

THE report of the Aquarium Show Exploratory Committee, set up to investigate what demand exists for a major aquarium show to be held in London, was given at a meeting of representatives of aquarists' societies held under the hospitality of Hendon Aquatic Society on 18th March. The Committee's findings were based on replies received to questionnaires, and these revealed a widespread demand for such a show. Of 37 replies received only three societies replied 'no' to the question "Do you want a show in London in 1966?". From answers to questions designed to determine the type of show that would be most favoured it appeared that most support would be forthcoming for a show designed to attract the general public and which would include sections for other pets, although several delegates at the meeting stressed that they thought these other sections should be restricted to reptiles and amphibians, birds and perhaps some small mammals. These were the questions asked, with the numbers replying 'yes' to each one appended: "Should such a show be a championship show, which would be of interest only to aquarists (7), or a show with separate society exhibits, and with trade stands, that would attract the public (12), or an aquatic section to a much larger show that would include other pets and attract a much wider public (20)?" Nineteen societies also indicated that they would be prepared to make some degree of financial contribution to the cost of a show.

Unanimous support at the meeting was given to a proposal by the Independent A.S. member (seconded by Uxbridge A.S.) that the Aquarium Show Exploratory Committee should continue to represent societies with the aim of furthering the staging of an aquarium show, to be organised by the pet trade or a professional organiser, with the possibility that at a future date the Federation of British Aquatic Societies should be approached to take over its administration.

The Committee received replies from the following societies: Basildon, Basingsize, Bedford, Bournemouth, Brighton, Bristol, Cambridge, Chelsea, Chingford, Crawley College, Deal, Dunstable, East London, Erith, Edmonton, Enterprise, Hampstead, Harlow, Hendon, Herts. F.G.A., High Wycombe, Independent, Isle of Wight, Llanrwst Major, Penryn, Portsmouth, Riverside, Salisbury, Sittingbourne, Stone, Tottenham, Uxbridge, Walthamstow, Weybridge, Weymouth, Willesden, Witham.

Wild Goldfish



Photo:

Wild-type goldfish

W. J. Howe

by RICHARD GUPPY

AS a coldwater fish that has been domesticated almost as universally as any other animal one could name, it is really surprising that the goldfish has not become naturalised in fresh water in many parts of the world. I do not claim to know exactly to what extent it has escaped into the wild, very little information on the subject is available. But there exists a sort of negative evidence; in the literature on fishing and freshwater fauna, there is seldom any mention of wild goldfish.

In *The Freshwater Fishes of British Columbia* (Carl Clemens and Lindsey; 1959) the goldfish is listed as an introduced species. Only two localities are specified, both in the interior of the province, but little recent information seems to have been available when the book was compiled. I have a dim memory from my boyhood days in Essex of a farm pond with large goldfish in it. Since, with other boys, I spent a good deal of time trying to catch these fish, they must have been unsupervised, but whether they were truly established, I could not, of course, venture to guess.

Some reasons can be suggested why goldfish might fail to survive when left to their own devices. The most obvious is their colour; being very conspicuous they would always be taken by predators before any other species with which they might be competing. But common goldfish (the only variety we need to consider here) produce quite a number of late colouring individuals in nearly every generation. Many of these breed once or more before taking on the red colour. Selection against the bright coloured fish might only tend to produce a late or non-colouring race.

It is usually during the first year of their lives that goldfish are killed by unsuitable climatic conditions. This result comes about simply because the young fish have not made enough growth during the summer and autumn. It is true that full grown fish are sometimes found dead after their pond has been frozen. There are various reasons for

such tragedies, none of which would apply to wild fish in natural waters. Fish kept in tanks outdoors, or in ponds which have been meticulously cleaned out, are more liable to die when frozen in, than would be the case if some decaying organic matter were present on the bottom. Also the strain of fish makes a great deal of difference.

Those which have been kept indoors for some generations, especially the fancy types, and those raised in subtropical regions, are bound to develop, by mutation, many individuals which are not resistant to low temperatures. In my experience (and I have had plenty of experience in that particular direction) it is not possible to produce a strain of goldfish which will be free from drastic mortality, if the water temperature cannot be kept above 70°F (21°C) during most hours of the day, for 3 months after spawning has taken place.

Other factors being equal, mortality seems to increase with the period of time during which the fish are continuously chilled. Chilling does not necessarily mean freezing, probably 45°F (7°C) is as bad as 32°F (0°C). So long as its body remains at a low temperature, the resistance of the fish to disease and parasites is being steadily undermined. If it is of a hardy strain, and past its juvenile tender stage, it will probably get safely through an ordinary winter in temperate climates; but weakly fish, and particularly those which did not get a fair chance to grow before cold weather set in, will usually be laid low by some 'bug' or other, often just as the water is warming up in spring.

It should be noted in passing that fish do not hibernate in the strict sense of the word. They cease to feed because metabolism is slowed down by cold. In true hibernation, a protective instinct causes the animal to anticipate an inevitable food shortage. The fish may have plenty of food available all year, but cannot eat in winter. The

mammal does not mind cold if food is obtainable. Cold-blooded animals do not lose weight in the winter, so they do not need to fasten for 'hibernation'. I have carefully weighed terrapins, which are more easily handled than fish, and have found that their weight remains absolutely constant during a 4 months' fast. The winter killing of young goldfish must be due to the fact that the built-in tolerance to prolonged chilling takes longer to develop when the fish grows slowly.

There is really small wonder then, that goldfish seldom manage to become established as wild fish in regions of cool and uncertain summers. For that reason I was more than a little sceptical when I heard the story of just such an occurrence here on Vancouver Island. The news first came to me through my wife, on her return from visiting a friend. The young son of this friend, so she told me, had been bringing in quantities of goldfish, which he had caught in the 'swamp'. I am afraid that I did not appear quite ready to swallow the story. At any rate, after her next visit, my wife brought home tangible evidence in a jam jar, in the form of two 2-inch goldfish. Even at that stage, I confess, I hauled out the literature to make sure that there were no native fish in western North America which might be confused with goldfish. Of course, the fin arrangement, combined with red colour, leaves no chance of error.

After that, I was not long in investigating for myself this extraordinary source of free-for-the-taking goldfish. Since I was on good terms with their finder, there was no difficulty in arranging a visit to the place. My first view of the site did nothing to allay my scepticism; it was not a swamp at all, but just a ditch beside a moor travelled, hard surfaced road.

I found that for a stretch of about 50 yards the water was stagnant, with a depth of 8 to 10 inches. At one end of this section a tiny trickle flowed in, at the other end the excavation ceased abruptly, the water being led under the road through a 12 inch culvert. Here it seemed that I might have come across an explanation for the presence of the fish. The other end of the culvert was quite submerged in the water of a wider and deeper section of the ditch, that appeared to extend for some distance at right angles to the road.

The mystery was not entirely elucidated by this discovery. My informant was quite in agreement with my suggestion that the fish in the roadside ditch were just an overflow from some larger reservoir. But he would have none of the theory that they came up through the culvert. His idea was that they came downstream after heavy rains had filled the ditch. He knew the owner of the field well, having done odd jobs for him at times. This man was not interested in goldfish, and had emphatically denied putting any in his ditch.

The fish were not difficult to catch, in fact most of those taken by my companion had been caught in his hands, since he had managed only a very makeshift net. With the more elaborate rig that I had brought along, I caught seven fish in a very short time. I also brought up a great variety of other water life, some of which helped to explain the apparent success of goldfish in colonising the ditch. It was well populated with tadpoles of the red-legged frog (*Rana aurora*), and with rough-skin newts (*Taricha granulosa*) in all stages of development. The tadpoles I found particularly interesting, because I have learned a great deal about the red-legged frog in the process of raising (or attempting to raise) several batches annually over a number of years. These tadpoles will not succeed in just any water, if removed from their natural haunts they often fail to transform before winter, and then cold weather kills them off. With all my experimenting I have never learned the exact reason for this trouble, but I did discover that they do fairly well in concrete ponds, from which it seems that it

may be just lack of calcium that holds them back. In Nature the frogs spawn only in water where the tadpoles will grow quickly to a good size. Since they breed readily in captivity, it is not likely that they know anything about the mineral content of the water. Possibly they just return to the ponds in which they were hatched; such a habit would surely have the effect of concentrating them in the most favourable water.

Even the newts, a very common amphibian here, were interesting. A large proportion were metamorphosed juveniles, a stage in their lives which is normally spent on land. It almost seemed as if they had found this ditch so well suited to their needs, that they had stayed on in the water after their usual time for taking up terrestrial existence had passed. I was not surprised to find that the soil through which the ditch had been dug was heavy clay. I have noticed that clay bottomed ponds are extremely favourable to aquatic life.

When starting on this expedition, I had fully expected to find many more hatchlings of the year than larger fish. Following the normal spawning season for goldfish, which hereabouts would be June or perhaps late May, the fry would have had time to grow into recognisable fish, without yet being decimated by predators, or the cold of winter. But, to my surprise, all the fish I caught were exactly the same size, about 5 inches long. Five were fully coloured, the other two had not yet started to change. This is about the proportion one finds in any garden pond where the fish have not been culled for a few years.

Not all the fish in the ditch had been of this size, as witness the two first brought to me. But the later history of these two is peculiar. I kept them for a year, and eventually they died without having grown any bigger. Other fish in the same tank grew well, one in particular, a hatchling when the wild fish were put in with it, had outgrown them by the time of their demise.

The conclusion seems unavoidable that there had not been a really successful spawning in the ditch for some years past. 1958 was a particularly good year for goldfish, owing to above normal temperatures prevailing from March well into September. Fish hatched that year would have been 5 years old, therefore could well be about the size of those I had caught. It must be admitted that uniformity in size is not very good evidence of equal age. Growth slows greatly after a certain size is attained, so that there tends to be a plateau on which the evidence of age difference is largely obliterated. Still, on the whole, the indications are strong that nearly all the fish in the ditch were the result of one very successful spawning.

I did not accept without reservations the assurances of my informant, that neither he nor his one-time employer had ever seen fish in that part of the ditch that was below the culvert. I privately decided to have a look for myself some day. But for one reason or another I did not get back there until the following spring, and then I found a startling change.

In no part of the system was there more than an inch depth of water to be found. Further investigation showed that the whole business had been held up by a dam in the field, which from the road had not been discernible, although it was not more than 50 yards away. The dam had evidently been put in to provide drinking water for cattle; why it had been destroyed I cannot say. Certainly it had been there for a long time. I remembered that several years earlier I had stopped to watch a muskrat feeding in the ditch, and there was enough depth then to allow the animal to swim under water without showing any signs of movement on the surface.

There was no sign of any run-off channel below the dam; clearly there had never been more than a dribble of water

Continued at foot of next page

Hemiodus semitaeniatus

by JACK HEMS

ELEGANCE is the key to this large characin's attraction. The beautifully streamlined body is shining silver overlaid where a strong light catches it with a glimmer of metallic green to blue. A conspicuous black spot adorns the flanks. Extending backwards from this bold marking is a black line that widens at the root of the tail and thence continues on to the lower lobe of the deeply forked caudal fin. The narrowly pointed extremities of this fin are sometimes tinged with pink. The other fins are more or less clear.

H. semitaeniatus—it has no popular name that I know of—is native to Guiana and Brazil and made its debut as a hooded aquarium fish in Germany as long ago as 1912. It is an active, fast swimmer (and a good leaper into the bargain) and flourishes best in clear, well-oxygenated water maintained at a temperature in the lower to middle seventies (°F). Ordinarily it has a hearty appetite and, apart from eating all the usual, and unusual, live and/or dried foods, will take quite a toll of the fresh shoots and tender foliage of some of the submerged plants. Therefore, to safeguard



these from excessive cropping, it is wise to include such things as finely chopped lettuce or tiny portions of cooked spinach in its diet.

It is a peaceful, shoaling species; at all events in its young days. But with good feeding and a spacious tank to dash about in it will not take much more than a year to attain a length of 8 in. or thereabouts. At this size it is really too large, too boisterous and too voracious to be kept in a community aquarium stocked with the general run of millimanned, smaller fishes.

Up to the present writing, *H. semitaeniatus* has not been bred in captivity, and if it carries any external sexual distinguishing feature aquarists do not know it.

A Simple Marine Aquarium

by RICHARD CAULTON

IT is surprising how many aquarists are turned against keeping marine life by notions of tremendous obstacles of cost and difficulty of upkeep. In fact a marine aquarium can be less expensive than an ordinary tropical tank, and the variety of sea creatures that can be kept without difficulty is vast.

The fascination of a marine aquarium is, indeed, not so much the beauty of the inhabitants (though they do possess beauty) as their great diversity. As well as fishes, small crabs, sea urchins, sponges, beautiful and bizarre shellfish, and even certain corals can be kept. These and a host of other animals can be housed together in the same tanks.

The tank is the most important single factor in the marine aquarium, as in any other. The best type to use is the one without joints, made of either glass or plastic. This eliminates any chance of damage from the action of sea water. In sizes of about 2 feet these are easy to obtain and almost as cheap as metal-and-glass tanks. The only other necessary item of any cost is the air pump for aeration, which the freshwater aquarist undoubtedly already has in his possession.

In many books on marine aquaria the authors give descriptions and diagrams of complex systems of filtration, often coupled with devices to simulate tidal movements and ensure a circulating water supply for the tank. In my experience these, though perhaps beneficial, are by no means imperative. If for example barnacles or some of the small molluscs are included in the tank they will, by virtue of their remarkable feeding mechanisms, make excellent

natural filters. As far as the question of changing the water is concerned: with a sheet of glass over the tank, the same water can be used, if topped up with tap water, to make good loss by evaporation, for a number of months.

There seems in fact to be a very good balance of Nature in the well-kept marine aquarium. Copepods, the marine equivalents of Cyclops, and other small creatures thrive and provide a natural food supply for the larger animals.

Another merit of the marine aquarium is that, although the occupant can be bought, the enthusiast can if he wishes catch them himself, and that's one thing he can't do with *Pachypanchax*!

Wild Goldfish

continued from the preceding page

running over, and therefore no great amount could ever have run in. The fish must have bred and multiplied in that little bit of water, in fact I much doubt that any had ever passed through the culvert. When we were pursuing them they showed a strange reluctance to enter the pipes: often they allowed themselves to be cornered and caught, when at any time they could have ducked into the culvert and remained there in safety until we chose to go away.

The colony was most probably started by a few fish thrown from a passing car. A number of factors favoured their increase: the clay soil, stagnant water with little shade to prevent warming by the sun, and absence of any other fish with which they might have had to compete. Also, as I have noted, they probably landed there just before a very favourable season. It is very unfortunate that the destruction of the dam prevented us from following up the fortunes of the colony over an extended period of time.

THE AQUARIST

A Bottom-Spawner—*Cynolebias whitei*

by A. VAN DEN NIEUWENHUIZEN

Photographs by the author

A BOTTOM-SPAWNING fish which has become better known in recent years is *Cynolebias whitei*. According to the German ichthyologist Dr. Werner Ladiges, *Cynolebias whitei* is found in the neighbourhood of Cabo Frio not far from Rio de Janeiro in Brazil.

The male *whitei* is considerably larger than the female. The scales of the body are rather large and may vary in colour according to the environment in which the fish are kept. If some specimens are kept in a tank with a dark bottom composed and others in one with a light bottom medium, the body colour of the fish will be seen to differ.

If the light is right, we can see that each scale has a light seam along its edge. The total effect of this is increased by the presence of a few rows of fluorescent spots along the body. These rows change into a pattern of stripes on the head of the fish, which makes the male *whitei* resemble the head-mask of the male *Aphyocheilichthys coeruleus*. The anal fin of the male *whitei* is very striking indeed. Its colour, like that of the dorsal and caudal, is wine-red. These fins are covered with the little blue-green spots, and the anal fin has a bright orange seam. The caudal has a fluorescent blue edge.

The female *whitei* is considerably less pretty than the male. The fins are much smaller, and the body colour varies between brown and grey. We can notice a dark spot near the anal fin, and another close to the caudal. When the female is in good condition, the body is covered with dark and light vertical stripes. The fins show dark spots.

As mentioned above, *Cynolebias whitei* is a so-called bottom-spawner. If we study the actual spawning process carefully, however, it becomes apparent that the different bottom-spawning species of *Pterolebias* and *Cynolebias* do not spawn in a similar fashion. In general it can be



The male *Cynolebias whitei* takes the initiative during the preliminary courtship.

claimed that the spawning behaviour of *Pterolebias longipinnis* and *Pterolebias peruvianus* is very similar, but that of *Cynolebias whitei* differs significantly.

In *C. whitei* it is the male who takes the initiative, despite the fact that the female is also very active. I have been able to watch this during my study of the mating behaviour of this fish, and have been able to photograph much of it.

It is a good idea to keep the sexes separated for a while (a week or so) if one wishes to watch the mating at a given time. As soon as we place the fish together, we see the male starting to court his mate. The female, at first greyish in colour, becomes darker, the vertical stripes become more clearly visible and the egg tube appears. In the beginning, especially before the egg tube appears, she does not respond too wholeheartedly to the advances of the male. The latter starts his courtship by swimming around the female while spreading his fins widely. He swims in a typical fashion, appearing to flutter his fins like wings before halting in front of his female. At the same time he also bends his tail fin slightly towards his mate, only to resume his dance again later when she moves on.



While the male searches in the bottom peat for a suitable spawning site the female excites him further by touching his fins.



In this picture of the beginning of the spawning dive into the peat, the female's egg tube is clearly shown.



Even with a camera shutter speed of 1/1,000 second the rapid vibrations of the male's dorsal and caudal fins during his downward dive register in the photograph.

A little bit later we see him swimming over the bottom, shaking lightly during his progress. In this stage he often stops right in front of the female, spreading his fins and looking like a big trap into which she has to enter. At first she often retreats, however, which in its turn incites the male to a further display of activity. His green spots become blue, something that creates a beautiful contrast with the red colour of the fins. By this time it may become clear that the female is about to end her resistance and will start participating in the spawning (this may be after a few minutes, but may also take half an hour). She then moves towards the male and the ensuing activities may happen so fast that things may be almost over before we realise what is going on. At other times, however, everything may go slow enough for us to watch. If we watch the course of events carefully, we first see that the female proceeds to excite the male by touching him. Sometimes she touches him with her body, in other instances she merely uses her mouth. She may touch the side of his body or the gills.

These signs of affection excite the male considerably. He starts searching the tank bottom very diligently for a suitable spot to spawn. He may suddenly stop his search, while the female is still showing interest. At this stage of the spawning procedure the female starts using even more advanced tactics to arouse her partner's interest. She touches the inside of one of the pectoral fins with her mouth. This really gets the male going. He reacts by searching more intensely than before, actually feeling the bottom surface in his search. The reason for this increased excitement can be found by studying the inside of the male's pectoral fins. These contain a series of small antennae, tiny organs covered with nerve cells. The stimulation of



After the spawning dive and mating in the peat, the male emerges first.

these nerves by the female excites the male very much indeed. Some of these antennae can be seen in the form of little white spots.

During his search of the tank bottom the male occasionally swims on his side. In that position he covers the female with his body, so to speak. We can observe the male's actions very well if we cover half the tank bottom with soft peat, leaving the other part hard. As soon as the male reaches the soft part, he tends to dive into the ground. As can be seen in the pictures, the female persists in her attempts to stimulate the male. If she is unable to reach his pectorals she merely pushes his side with her mouth. Sometimes she opens her mouth while pushing, so that it looks as if she is actually kissing her partner. As soon as the male has found a suitable spawning spot, he disappears into the compost. In doing so he assumes an oblique position, while folding his anal fin in the direction of the female. Sometimes the female dives simultaneously into the soil, but at other times we see her wait until the male is halfway down before entering. During this brief moment the female keeps in contact with the male. If the contact is broken the male is almost certain to stop his downward movement.

If there is a thick layer of peat moss on the tank bottom, we won't see much of the actual spawning act. With a thinner layer or when the fish happen to spawn close to the front glass, one can better observe what is going on below the surface of the compost. As with *Pareolabus* species, the fish bend their bodies strongly, and the female always lies below the male during the spawning act. If there is only a thin bottom layer the male remains almost above the ground.

Usually the male is the first to reappear after the spawning; the female follows later. It may take her up to 3 minutes to come up again. Sometimes both fish reappear simultaneously. Gradually the spawnings become more violent and follow one after the other, progressively faster. Sometimes the male tries to fold himself across his mate, but she does not seem to like this. She tends to react by moving away. The male tends to do this when he reappears long before his female. He waits for her with his fins widely spread and approaches her as soon as she appears above the surface. Sometimes the male is so excited that he commences diving into the soil again before his partner has had time to come up completely. This kind of behaviour does not lead to a complete spawning, however. An indication of the activity of these fish is the fact that I discovered that a shutter speed of 1/1000 second was not

fast enough to "freeze" the vibrating movement of the male's dorsal and caudal fins during his downward dive. All my pictures of this particular phase show a bit of blurring due to movement.

From this description it may be concluded that the male is the initiator in the spawning, activated, however, by his female. The latter tends to follow a relatively stable pattern in her co-operation with the male. We see exceptions, of course, but from pictures and movies it is apparent that there is a large degree of regularity and stability in the spawning behaviour of *Cynolebias whitei*. We can observe this easily, but some aspects must be photographed because they occur too fast to be noticed by the unaided eye.

Finally, a few remarks about the development of the eggs, the hatching and rearing of the fry. The eggs of *Cynolebias whitei* are rather large and clear. It is easy to find them in the peat after the spawning. It is easy to separate the fertilised eggs from the rest. The fertilised eggs are somewhat adhesive, so that they tend to stick to the peat, but this is not so for the bad eggs, which also tend to be white in colour. If one keeps the eggs in water during the first 2 weeks one can follow the development of the embryo nicely. First we see the initial splitting of the cell, then the further development of the fry.

After 2 weeks it is advisable to place the eggs in moist peat. It is sufficient to keep the eggs 'dry' for 6 weeks but there is reason to believe that a period of 10 weeks will give better results. If one has kept one male *whitei* in the company of two females over a one-week period, one may count on about 200 fry. If the females are larger, of course, we can expect better results than when they are small or very young. We have to keep an eye on this kind of breeding situation, because when a female is totally empty, she is best removed from the tank. If this is not done the male may chase her to death. During the breeding period the best food is blood worms and *Tubifex*. The fry should be fed live baby brine shrimps immediately after hatching.



Eggs of *Cynolebias whitei* some hours after spawning. Fragments of peat stick to fertilised eggs, which are clear and colourless.

They grow surprisingly fast and may soon be given *Daphnia* and, later, *Tubifex*, white worms, mosquito larvae etc. In a good sized tank the young fish will measure 1½ inches in about 4 weeks. At that time they will start also their first breeding attempts.

I would advise you not to separate the sexes too long before breeding, for the females start spawning together to get rid of their eggs. *Cynolebias whitei* is a so-called annual fish, but we can have a steady supply of them by keeping a supply of eggs at hand. The eggs can be kept for a very long period of time and make it possible to raise new *whitei* at your convenience.

AQUARIST'S Notebook

by T. ROLAN

A PART from their activities around garden ponds, I had not thought of cats (the furry kind, not the aquatic ones) as being a menace to the fish-keeper with a fish house. However, recently I was told about an experience of a well-known goldfish breeder that proves my view to be a mistaken one.

Last one night he heard the crashing of broken glass from his fish house, and discovered on making his way there a very scared feline scrambling frantically over his tanks and knocking glass and jars etc. to the floor. After he had lured it out of the door he found that the beast had been walking over the glass roof and had fallen into the fish house when one of the panes gave way.

Aquary keepers complain often about cats scaring their nesting birds with their roof-top prowling at night, and now it seems that aquarists, too, are at risk, as the insurance people say, in this respect.

Aquarists soon become used to the vagaries of hoses, which often seem to develop into a living form when water goes through them. But beware of the hose that is left full of water with one end in the tank. An experienced

fish-keeping friend of mine found that he had done this some hours after he had disconnected the hose from the tap. When he returned to the scene the tank had only a half-inch of water left in it and his large breeding pair of angels were flapping about on their sides. The rest of the water had siphoned out through the hose. Fortunately the fish showed no after-effects of this experience, but the episode might well have been a disaster.

I lost one of my own angels last month in a way that is a well-known and singularly frustrating trait of this fish. I moved a pair that had occupied one tank for about 6 months to another tank only a few feet away. They were transported this short distance after netting in a large jar of their own aquarium water, but almost immediately one of them turned on its side and refused to do anything but lie there and "pant". As I feared, in a few hours it was dead; its mate was completely unaffected by the move and remains well. This type of loss never seems to occur with small angels, only with the big ones; nor have I known it to happen with any other kind of fish, though I believe large discus can show the same trick. Does anyone know the answer?

Starting Right

A pictorial
establishment of

Photographic



1



2



3



4



5

If the aquarium has been used before it is first cleaned with a nylon pet scourer kept especially for this purpose (1). A new aquarium needs only to be rinsed, care being taken not to disturb the end panels when it is lifted.

The gravel for the base is washed, a small amount at a time, in running water (2) until it is free from matter likely to cloud the water.

After the gravel has been placed in the tank (now in its permanent position) water is siphoned in from a bucket (3). A sheet of brown paper or polythene over the gravel avoids disturbing it and possible water cloudiness.

Rocks should be well scrubbed with a brush in hot water (4), before being placed in position in a natural fashion (5). Notice how the strata are all placed in the same horizontal plane.

with the Aquarium

the successful
a furnished aquarium

SKIPPER



6



7

Water plants are washed thoroughly in rapid water (6) and any damaged leaves are removed. Remember to keep them well dampened and covered when out of the water. Small lead weights can be attached at this time to anchor them in the aquarium whilst roots are forming.

A planting stick is used to set the plants in position (7), the taller-growing kinds being placed towards the back and low-growing species being given more frontal positions. Leave the tank for at least a week before fishes are introduced.

ABOUT THE POND THIS MONTH

Stocking with Fishes

by A. BOARDER

FOR a garden pond constructed during the winter months and recently stocked with water plants, now is a good time to introduce some fishes. Many newcomers to the hobby try to keep too many fishes in the pond and so stand the chance of something going wrong before the summer is out. There seems to be an idea about that to have a successful pond it is necessary to fill it with fishes of all kinds. This is quite wrong; it is much easier to maintain a garden pond in excellent order for many years if it is not overstocked at first. There must always be sufficient swimming space for all the fishes and there must also be spare room for them to grow and develop in a healthy manner.

It is difficult to give a precise number of fishes suitable for a pond, because of the differing sizes and depths of ponds of the various designs. If it is intended to attempt to breed some of the varieties of goldfish it is important that only one type is kept in the pond. All varieties of goldfish will interbreed and so a number of unhappy ones could be obtained which would not be worth the food they ate.

As a rough guide, a pond 10 feet by 5 feet, of varying depths from 1½ to 2½ feet, will be taken and the pondkeeper will be able to assess the numbers of fishes needed for a pond of similar size. In such a pond I would recommend

four goldfish, four shubunkins, four fantails and four comets. These fish should be not more than 3 inches long over all. Two small tench could be added, either green tench or golden ones.

These fish would have room to grow and to develop strongly. Although such a mixture of varieties would not be intended to breed, if there were sufficient water plant coverage in the pond they might do so. A few youngsters might be reared but their parentage would be, of course, very doubtful and they would not be of much value.

If a greater variety were required then some of the goldfish varieties could be dispensed with and two or three golden rudd, golden orfe or bitterling could be added. The orfe could grow very large in a few years with good feeding, but the others could very well remain in the pond for a number of years without getting too large for their pond. It may be noticed that I have not mentioned any scavengers. This is because I consider that a hungry goldfish is just as good a scavenger in the pond as any catfish or other type of so-called scavenger. Tench can eat up most of the spare matter in the pond, but also so could the goldfish as long as it is not otherwise overfed. The amount of food needed to be given to pond fishes will depend on the amount of natural food available. In any pond with a fair growth of water plants there will always be a certain amount of

food, but as the fishes grow it may be necessary to give some extra.

The fewer fishes there are in the pond the less trouble will the pond maintenance be. Not only will the fishes keep more free from any disease but they will need so very little food that it is possible that the pond can be self-supporting. It is a sure sign of overstocking with fishes when it is necessary to feed them every day.

If it is required to breed a few goldfish in the pond it may be necessary to feed the fishes to assist them to develop their eggs. The old recommended food for this purpose consists of garden worms, and I cannot find anything to equal it for value. It is also a fact that very few fishes will refuse to take worms when they are hungry. Breeding will be the subject of my next article.

If any new fishes are purchased make sure that you do not introduce any pests or diseases into the pond with them. It is a good plan to place a new fish in a glass container and examine it carefully. See that there is no sign of fungus on the fish. Watch for any sores or inflamed patches. Also make sure that there are no fish lice on it; these may not be very evident to the beginner, but the lice usually stick to the body or fins of a fish and cause a small wound. This may appear as a small red spot and such a sign should be investigated. A healthy fish will normally carry its dorsal fin erect. If a fish is ailing this fin is usually lowered. I have, however, noticed that in a fish suffering from swim-bladder trouble this fin can still be erect. Strange to relate, a fish in an upside down

position from swim bladder trouble appears little the worse for the position and its fins can remain extended.

When introducing fresh fishes to the pond always enquire about the temperature at which they have been kept at the dealers. Many fishes are subjected to almost tropical conditions and so, when they are placed in a cold pond, they soon develop troubles. If you find that this has been the case do not put the fishes straight into the pond but try to keep them for some hours in a rather cooler position than that in which they have been. The carrying can can be lowered into the pond water so that the temperature gradually gets to that of the pond.

Do not try to keep any freshwater mussels in your pond if it is freshly made. These molluscs can only live in water which has a good depth of mud or silt at the bottom. They travel about and feed in such matter and if the pond is a new concrete one, the mussels would soon die and pollute the water very quickly. As for water snails, this again is a matter for the individual. They will do little good in the garden pond and again little harm. They can provide a little food when their young hatch out from the eggs, but they can eat some of the water plants and would surely eat some of the fishes' eggs if in any numbers in the pond.

The main point to consider when stocking the pond is to try to think what the numbers would be likely to be in a similar amount of water in the wild. Also remember that it is far easier to keep a few fishes healthy in a pond than to try to do so with too many.

HOUSE PLANTS FOR THE FISH HOUSE

"Busy Lizzies"

by B. WHITESIDE

THESE attractive house plants will thrive in a light position in the fish house and will reward their owner with an attractive display of small flowers. Two sizes of plants can be grown. *Impatiens hybrid* will grow to a height of about 12 inches, and the plant comes in a variety of hybrids with colours ranging from whites and pale pinks to reds and pale purples.

For a smaller neater plant, *Impatiens*, or balsam as it is called, variety Orange Baby or Scarlet Baby, can be grown. These plants reach a height of about 4 to 6 inches, and, as the names suggest, have bright orange and scarlet flowers with a luminous tone which stands out from the pale green leaves of the plant. The plants can be grown from a packet of seeds; these require a well drained seed compost and a reasonably high temperature for germination. The seedlings should be pricked off into 3-inch pots, John Innes Potting Compost no. 1 being used. They require frequent watering during the summer, but this should not be excessive as it may lead to decay of the roots and stems. The plants like a light airy position and when they receive conditions to their liking they respond with masses of bright luminous blossoms, freely produced throughout the summer season. The dwarf species produces compact little plants, a group of which, when in flower, is a sight to be remembered.

Plants have almost transparent stems which root easily from cuttings inserted in jars of water and later potted in



3 inch pots. Plants can be brought through the winter if given some heat but are so easily grown from seed that this is usually not worth while. Packets of seeds are inexpensive and extra plants not required for the fish house can be used for decoration in the home, or can be planted outdoors as bedding plants if well hardened off.

Plants require little attention and if they do become too large or leggy, they can be cut back and will soon produce fresh new growths from their base. Parts removed can be used as cuttings.

A Springtime Breeder—the Bitterling

by B. FRY

THE bitterling, or bitter carp, a barbless cyprinid so named because of its acrid-tasting flesh, is native to central and eastern Europe and Asia Minor. In Britain it is said to have become established in recent years in parts of Yorkshire. It is technically known as *Rhodeus amarus* (*amarus*), and averages around 2½-3 inches in length. Out of the mating season (April-June) it is grey-green on the back shading to silver on the sides. But when breeding time draws nigh the male sports a rainbow lateral stripe and a galaxy of wonderful body colours, violet, pink, orange, green and blue predominating. Even his fins, which are normally pinkish to yellow, or grey, assume richer tones. The dorsal and anal fins, for instance, become bright red margined with black; the sufficient lobes of the forked caudal fin melt into a vivid blue-green base. The female, not to be outdone, develops an over-tone of pink to pinkish yellow and a longitudinal stripe which reflects varying prismatic tints. Small wonder, then, that the fish is often referred to as the rainbow carp.

Apart from the beauty of its springtime apparel, the bitterling is very popular with coldwater aquarists because it is not fastidious about what it is given to eat, and will take dried or live food, or substitutes for live food, freely. Furthermore, it has a remarkable and unusual spawning procedure. This it will quite readily demonstrate at the proper time of the year in an aquarium furnished to suit its special tastes. First you must cover the floor of the tank with a thick carpet of well-washed sand, or fine grit. Then, after the tank has been filled with ordinary tap water, some bunched plants such as *Elodea densa* or *Ceratophyllum demersum* must be introduced for their straggling qualities. The plants should be weighted to the bottom with lead bands, or tied to stones. Most important of all, however, are two or three pond mussels. Those belonging to the genera *Unio* or *Anodonta* are recommended. As freshwater mussels are heavy consumers of oxygen, and need a reasonably spacious bottom area to move around in, a tank measuring not less than 24 in. by 12 in. by 12 in. is advised.

The presence of the mussels, combined with the stimuli afforded by the season's higher temperatures (a range of about 65°F (17°C) to 70°F (21°C) is about right), longer and brighter days, and gaudy habiliment of the male has an interesting physiological effect on the female: she develops from just behind her ventral fins a pinkish, worm-like tube called the ovipositor. This tube down which, presumably, she sends her adhesive eggs, is readily manœuvrable and can be extended to roughly 2 inches in length. I say presumably because quite recently the interesting theory has been advanced that the eggs do not emerge from the tip of the vermiform appendage at all but from the orifice of a much shorter and scarcely noticeable organ, placed immediately in front of it.

But let us return to the male. About this time small white tubercles (nuptial excrescences or pearl organs as



Photo: Laurence E. Perkins
Male and female (right: with ovipositor showing) bitterling poised above a mussel

they are called) develop above his upper lip and eyes. Concomitant with this sign of fertility he becomes even more resplendent, and soon takes to swimming to and fro over a mussel. Not infrequently he rubs his body or snout against the lips of the mussel's shell.

It has been said that this curious action is performed to insure the mussel to what is to follow. And what follows is this: the female, perhaps preceded or accompanied by the darting and shunning male, glides over the mollusc and, as she does so, ejects an egg or two into the ciliated breathing apparatus of the mussel. Fertilisation of the implanted ova is achieved by the male releasing his milt at about the same time. It is interesting to note that if the valves of the mussel snap to after the female's brief visit, the male will stay around until they open again.

This performance is usually repeated at irregular intervals over a period of about a week, and more than one mussel may become the repository of the fish's forty or more eggs. The eggs hatch out in a few days, but the fry stay attached to the walls of the mussel's gill-chamber for a good while longer. During this time they absorb the contents of their abdominal yolk sac and, it is believed, fatten on particles of edible matter and Infusoria inhaled by their host. After they swim out of the mussel, Infusoria must be continued to be provided for a week or so, after which the silvery fry should be large enough to take brine shrimps, tiny *Daphnia* and powdered dried food. Thenceforward growth is very rapid.

In a well planted tank the baby bitterling may be left with their parents, but some breeders, playing for safety, tap a loaded mussel to close it, then remove it with its bitterling eggs to another well-oxygenated tank for the fry to hatch out without the over-crowding of the parents. It is interesting that there is a reciprocal action on the part of the mussel. For when these molluscs breed the females pour out from their brood pouches tiny larvae furnished with a sticky thread by which they can adhere to passing fish. Once attached to their host they imbed themselves in its skin and do not release their hold until they are large enough to drop off and lead an independent existence.



A Garden Method of Culturing Water Fleas

described by N. STOCKS

THE difficulty in finding *Daphnia* is the main deterrent to most people in feeding this fine food to their fishes.

However, if you have a sheltered spot in your garden and you are prepared to go to a little trouble, as most of us are, for our fishy friends, you can produce as much as you require.

I have never seen *Daphnia* in its natural habitat, yet in the past 2 years I have bred them by the millions and have fed all my fishes as many as necessary for their health.

The first *Daphnia* I ever saw were shown to me by a fellow aquarist, who gave me some *Daphnia* in a pound jam jar to take home with me; it is the descendants from those that have kept my fish in live food over the last 2 years, even though my stock of fish has grown from half a dozen to several hundred.

High Rate of Growth

Nothing has ever astonished me more than the rate at which *Daphnia* reproduce from spring to autumn. It is truly fantastic, and their successful culture has been to me as interesting as the breeding of fish.

I must emphasize that my method of culture is not the only one known by any means, but it is successful, and that is sufficient reason for making it known to you.

My early experiments were made in an old baby bath, but I now use old double concrete washtubs. First of all you must make arrangements to feed the *Daphnia*, and this means a good quantity of green water. However, you cannot keep them in the same container as the green water or they will clear it of all organisms faster than they can reproduce. This is the reason for having the two separate containers, one for *Daphnia* and one for green water.

I first started my green water culture with a pinch of warmish clippings from the lawn mowings heap, plus a dash of soya bean flour, mixed first, like mustard, and then added to the water. In the full spring sun it will begin to turn green in 1 or 2 weeks; after that it is merely a matter of a little more soya bean flour being added. As soon as it is really green it is food for *Daphnia* and the more like pea soup it becomes the more *Daphnia* you will have. However, do not overdo the soya bean flour or it will begin to smell and 'go off' and become useless.

Food for the Fleas

I mix two heaped teaspoons of soya bean flour to the one half of a double washtub once a week in spring, increasing to twice a week when the sun gets higher and the *Daphnia* are breeding really fast. This is usually about the time my young goldfish and shubunkins are big enough to take them as fast as I pour them into the ponds. At this time I am pouring one 2 gallon bucket of water thick with *Daphnia* into the ponds. This 2 gallons is replaced by 2 gallons of green water from the tub of green water, and this in turn is topped up with 2 gallons of tap water. All

this *Daphnia* is produced for the cost of four teaspoons of soya bean flour a week.

The green water is also the first food for my young fish. From the first it has always had in it *Parasitium* and other animals, and I presume that the soya bean flour keeps them so plentiful. I check drops of water from time to time with my son's microscope to make sure that they are there.

Sometimes your green water will 'go off' and smell, even though you have not overdone the soya bean flour. It goes greyish white and if not disposed of gets so foul that even the snails die. I have found this to be the fault of an organism in the water which apparently gobbles the algae faster than *Daphnia*; the soya bean flour is not consumed, bacteria take over and the result is a very bad smell.

I think that birds must be responsible for bringing this organism from natural water when they perch on the sides of the tub to drink. That is why I have two tubs of green water. I have never had them both 'go off' together. I clean the affected tub out and scrub with hot water and strong washing soda.

Cleanliness is Essential

Another point to remember is that you must be scrupulously clean when feeding from the *Daphnia* tub and topping up with green water. If you use the same utensil to dip out the *Daphnia* and to ladle the green water into the *Daphnia* tub, the chances are that you will transfer a few *Daphnia*, which have stuck to the sides, into the green water tub. If this should happen all the green water would be used up in a fortnight by the *Daphnia* which had been produced from those few. I have an old bucket which I use exclusively for the *Daphnia* but if by any chance I do use any other utensil I immediately rinse it under hot water. I have learned these few points the hard way.

All this may sound a lot of work but like everything else, you become skilled at it and in no time it is no trouble at all. Second-hand tubs are quite cheap and even if they leak slightly this takes up as the algae grows and blocks up any cracks. If you acquire a set of tubs make sure that you thoroughly clean and scrub them or you will have trouble getting your cultures going, as neither the *Daphnia* nor the organisms in the green water like either detergents or soap.

If all this seems too ambitious for some of you, don't hesitate to have a go with a smaller container. Joseph, my son, has kept his tropicals fed with *Daphnia* cultured in a 2 pound glass jar for the last 2 months. He has fed his fish by tipping some out of the jar and then has topped up with green water from one of my tubs.

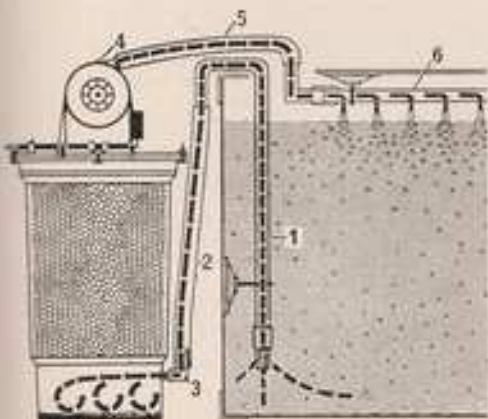
The main essentials are plenty of light and a little extra warmth in winter for the *Daphnia*. Don't worry about a bit of sludge or a few leaves in the tubs, the *Daphnia* like it. Throw a banana skin into your green water, it seems to help; also have a few snails in each tub.

Reprinted from "New Zealand Aquatic World"

New Aquarium Power Filter



Eheim filter, with absorbent filter medium pack between layers of nylon wool



Eheim Aquarium Power Filter. Overall dimensions: 6½ in. diameter by 15 in. high. Price: £11 15s. Supplied by South Coast Aquatic Nurseries Ltd.

THIS filter combines the features of high rate of water flow through it, a large filter medium capacity and a return achieving forced aeration of the aquarium. The first and third of these features are efficiently provided by a neat electrically operated pump mounted on a plate secured by wing nuts to the cylindrical filter. The pump is silent in operation and, like all parts of the apparatus, is corrosion free, so that it can be used with sea water as well as fresh water. Water flow is traced by arrows in the diagram on this page, from polythene intake (1) via (2) through the filter and from the pump (4) to a perforated return tube (6) secured above the water surface and along the aquarium's length. Air is forced into the aquarium as the filtered water is pumped back through the jets, which also ensure that aquarium sediment is dispersed towards the intake pipe for removal. One gallon per minute is the rate of flow. Strong clear green plastic is used in the construction, this colour preventing algae growth in the apparatus. Convenient packs of carbon or special absorbent filter medium are available for the Eheim. A sump below the filter medium allows accumulation of larger particles of sediment so that the medium is not blocked by them. In a fish house this unit is ideal for use as a mobile filter, being moved from tank to tank as needed; a useful extra accessory is a supporting frame to hang the filter on the tank. A larger model having a double pump unit and two intakes, for use with aquaria of more than 50 gallons capacity, is also available.



Closer view of the compact electric pump (220 volt, 28 watt) mounted on top of the filter unit

A Collecting Trip to Tacoma

by GIL HEWLETT

(Vancouver Public Aquarium)

ON 17th January Vince Penfold, Billy Wong and I embarked on a collection trip to Pt. Defiance, in Tacoma, Washington, some 170 miles south of Vancouver. Our objectives were to collect specimens not normally or easily obtained in our local Vancouver waters, and also to study the very interesting Pt. Defiance Aquarium, built in 1962.

For most of the journey we were enveloped in thick swirling fog which made driving quite difficult. We arrived at the Aquarium Sunday evening just in time to have Cecil Beausseau, the curator of both the Zoo and the Aquarium, give us a royal tour. Cecil had been curator of the old Pt. Defiance Aquarium for many years and is a tremendously inspired and hard working person who has made considerable contributions to the aquarium field.

The aquarium, a fascinating and unique establishment, cylindrical in shape, consists of a large central "ocean" tank which may be viewed from both above and below the water level. Many different species are found here, such as orange rockfish (*Sebastes pinniger*), yellowtail rockfish (*Sebastes flavidus*), octopus, starfish, large dogfish sharks (*Squalus acrobelas*) and a magnificent chinook salmon (*Oncorhynchus tshawytscha*), weighing approximately 35 pounds. Every Sunday a diver dons a weighted, brass shoulder helmet and descends into the tank to feed the fishes. Speaking into a small microphone under his helmet, he reveals to the public some of the interesting habits of the animals feeding about him. Standing on a walkway surrounding the large tank, spectators are able to watch the show through glass windows. Along the outer wall of the passage way are many beautiful display tanks.

Vince was intrigued by the idea of a trip into the depths of the tank, complete with diver's helmet, wet-suit and microphone. However, it was less than successful. The helmet was cumbersome and obstructed his vision, so that a small octopus which followed him around was constantly getting stepped on. Worse yet, his pleasant speaking voice came out distorted into an unintelligible sound.

The actual operation of the aquarium is the epitome of simplicity and efficiency. Raw sea water is pumped up from the sea, some 300 yards away, to an epoxy-covered steel trough above the tanks. The trough curves around the building and water for the tanks is siphoned from it. This eliminates many mechanical difficulties. The overflow from the fibre-glass tanks drains into a trough on the floor and out of the building. The plankton found in this pure sea water serves as the natural food for most invertebrates and enables the public to see these creatures in peak condition and to watch them actively feeding.

On Sunday night we went beach setting off Pt. Defiance with full-time collector and assistant, Don Goldberry. Taking advantage of a very low tide, we managed to obtain many interesting fishes such as ratfish (*Hydrolagus colliei*), whiting (*Theragra chalcogramma*), painted greenling (*Oxidea picta*), white-spotted greenling (*Hexagrammos stelleri*) and sturgeon poacher (*Aposus acipenserinus*). We also collected several beautiful sailfin sculpin (*Nannobrycon taeniatus*) by dip-netting them off a sea wall.

The operation of a beach seine itself consisted of a 400 foot line at either end of a 150 foot seine with floats on the

top and leads on the bottom. One line and the net were coiled on a small boat while the end of the other line was secured on the beach. As Don drove the boat straight out from shore, Vince paid out the line and net to a distance of about 400 feet off shore, then the other line was brought back to the beach. With two men on each line, the net was slowly and laboriously dragged ashore, entrapping fish and invertebrates that lay in its path. Once beached, the

Continued on page 16

The Kissing Gourami



Photo:

Lawrence E. Perkins

THE kissing gourami (*Helostoma temminckii*) is of the anabantid family. It is a most interesting fish and may reach a length of 4 inches in captivity although twice that length may be reached in the wild.

The kissing gourami is cream in colour, although a slightly darker shade may be noticeable above the elongated anal fin during spawning.

The most striking feature in the manner of the kissing gourami is its familiar attitude of "kissing", which may be observed almost continuously. Although the lips are large in appearance the throat of the fish is comparatively small. The basis of its diet is algae but the fish must have plenty of dried food, which must be of a fine nature.

Distinguishing the sexes is rather a problem. The kissing gourami, unlike other gouramis, does not show a different fin structure for each sex. The only sexual distinction is that the female appears broader when viewed from above.

Unlike most gouramis, the kissing gourami when spawning does not make a bubble nest for the eggs. Instead the eggs are surrounded by a film of oil which makes them rise and adhere to the water surface.

M. M. Clark

THE AQUARIST

our readers



write

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

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

Thermostat and Air Pump

I READ with interest Mr. Scarrott's letter in the February issue, but I feel a word of warning is necessary before other readers copy this idea of wiring vibrator pumps in parallel with tank heaters. This practice is liable to cause sparking at the thermostat contacts which will lead to blackening and eventual failure to complete the electrical circuit when the contacts close. The trouble can be quite easily overcome by wiring a suitable capacitor across the thermostat contacts. The exact value will depend on individual circumstances, but can easily be found by trial and error. It should be the lowest value which will eliminate the spark; if too high a value is used there is a danger of both heater and air pump running at reduced power when the thermostat contacts are open. A useful starting value would be 0.1 mfd, 350 volts A.C., which could be supplied by any radio component shop.

F. C. BOGGER, B.Sc.,
Chelmsford,
Essex.

Teaching the Aquatic Way

IT probably depends on the type of school whether the entrance hall can be a suitable place for an aquarium to be sited (as Mr. B. Whiteside suggests in the March issue). The experience of a school teacher friend of mine suggests that a non-opening top to the tank is necessary if it is in an unwatched situation.

He spent a whole morning at school setting up a tropical aquarium with a tasteful display of rocks and plants, switched on the overhead lighting and left it to 'settle down' before placing in the fishes. Just over an hour later, when he came back to look at his tank, he found that a wafer of green soap had thoughtfully been added by some unknown hand. He had to dismantle the whole set up before it could be made ready for use again.

T. ROLAN,
Morden, Surrey.

Bedroom Aquaria

I WAS amused—and somewhat relieved—to discover from your February issue that I am not alone in being faced with the problem of tanks of fish in the bedroom (Mr. Billy Whiteside's article "Fish in the Bedroom").

Having exhausted all other available areas in the house we now have six tanks installed in our bedroom. (My

husband assured me at first that this was a temporary measure.) I have become quite fond of our fishy guests, but they certainly present problems! Firstly I would point out to Mr. Whiteside that buckets of water from the bathroom are not necessary if you have a garden hose. This can fairly easily be passed through the upstairs window. If employing this method it is advisable to ensure (a) a strong waterproof covering on the floor, and (b) that your neighbours are not over-sensitive, or are used to your eccentricities.

Secondly, if your fish need a meat diet, make sure that their supplies, stored in the refrigerator, are in an airtight container, or do not have the chance to mature too much. The odour of over-ripe prawns, whilst appealing to fish perhaps, does not mingle well with the butter etc.

Finally, if your fish require live food, this can apparently also be stored in the bedroom. I caught my husband hastily pushing a jam jar out of sight behind the tanks; on examination this proved to contain a selection of juicy earthworms!

(Mrs.) J. N. CARRINGTON,
Dorking, Surrey.

Modified Thermostat

REFERRING to the article "Thermostatically Speaking" in the February issue, it is possible that some readers have gained the impression that by the modifications described by Mr. Staines, only an external thermostat can be made to control to plus or minus 1°F. Such is not the case, of course.

Mr. Staines has described how to get the best control from an external thermostat by making it follow the water temperature as closely as possible. The variations in temperature which remain will be due to the thermostat characteristics, and may be as close as $\pm 1^\circ\text{F}$ for a very good one.

J. GRANT,
Hayling Island, Hants.

Events in Germany

THANK you for including my letter in the January issue concerning the German Shows and Congresses. May I ask whether you would be kind enough to publicise the following further information.

The German Guppy Federation (D.G.G.) have their International Show in the Berlin Aquarium, and this commences on 22nd August and lasts until 29th August. British exhibitors will not need to pay entry fees, as these

have been waived. Judging will be identical to P.G.B.S. Standards. There are classes for single males and also for three males, which must not be from the identical brood.

The East Berlin International Show to be held in Humboldt University commences on 5th September and this is to be followed by their Congress from 10th to 12th September inclusive. Classes for the East German Show are not yet known to me.

I am also advised that West Berlin members will gladly accommodate British exhibitors in their own homes, provided, of course, that they are not too numerous.

As a lot of interest has already been aroused through your January issue, I feel certain that your readers might also like to have the above news.

R. O. B. LEE,
Rushp, Middlesex.

A Collecting Trip to Tacoma

continued from page 14

teeming contents of the net were soon emptied into waiting tubs of sea water.

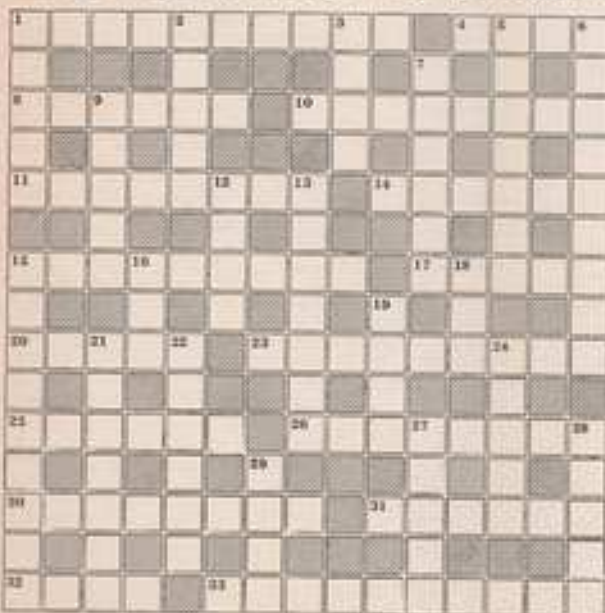
On Monday, Don, Vince and I went trawling, while Billy and Ron (an employee of the Ft. Defiance Aquarium) went fishing for yellowtail rockfish. Otter trawling in-

volves the use of two boards, which, when in the water, shear to left and right, keeping the conical net open. The outfit is dragged along the bottom for a period of some 20 minutes, so as not to injure the captured fishes. A fair number of specimens were obtained in this manner, including giant sculpin (*Rhaphiocottus richardsoni*), lemon sole (*Parophrys vetulus*), pigmy poachers (*Odonaspis trispinosa*) and a couple of baby octopus (*Octopus* sp.). Just as we were finishing up for the afternoon, Billy and Ron arrived on the scene, coming from the west. They had started out to go 2 miles to the east and had managed, somehow, in the thick fog, to get 6 miles past their point of departure in a westerly direction. Safely returned, they looked very chilled, a little shaken up, and were without any yellowtail rockfish.

Beach seining was resumed that night and the next morning Vince went Scuba diving with Don while Billy and I loaded the truck with fishes. We left Tacoma in mid-afternoon, after thanking Cecil and his congenial staff of four for a most enjoyable stay. We stopped at the Seattle Marine Aquarium, run by Ted Griffin, a very enthusiastic individual, who is interested in capturing a killer whale (who isn't?). The trained harbour seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) were utterly fascinating and are a great crowd pleaser. Ted very kindly gave us a fine 7 inch specimen of a scallop (*Pecten* sp.) as a parting gesture. We finally arrived back at Vancouver about 2 a.m. and after unloading all the fish into various tanks, wended our weary ways home for a much-needed sleep.

The AQUARIST Crossword

Compiled by M. W. SAUNDERS



CLUES ACROSS

1. Fish that can exist without water (10).
4. Descriptive of a certain bottom-dwelling fish (4).
5. Noun that the ship hatched (4).
10. Found on the water's edge! (3-3).
11. Noticing a fish is diseased (8).
14. They guide ships and aircraft (6).
15. Might wake you—but would put a *Plavonem* to sleep! (4, 3).
17. Teacher (2).
18. Skuffled with a grip! (3).
23. Eaten, in turn, about the pulpit (9).
25. Watches the eggs cook (6).
26. Common name for *Labeo rohita* (3-3).
30. Adverb (2, 8).
31. Sea-going container (6).
32. Fish which might get under your feet (4).
33. They help the Scyres (10).

CLUES DOWN

1. Useful for checking your fishes' specs! (5).
2. Skilled (5).
3. Where fish have built-in spotlights (4).
7. Warning from a watchman (4-3).
8. Nine runs for hidden bananas (9).
9. What 33 across does—surreally (8).
9. How fishes go to school? (5).
12. Yours truly rushed to the country (4).
13. More colourful, but not carried by fellow aquarists! (7).
17. Under foot drinks! (9).
18. Bridge that you and keeps the water in (3).
19. Sun goes round to occupy (3).
19. Our feathered friend might follow the lady (4).
21. Sea salt? (7).
22. Spruce goes round and round the *Brachyplatys vari* (8).
24. His ship were aground on a mountain (3).
27. Type of anchor yating on the bed (5).
28. The arm provides the link—just about (4).
29. Enquiries about some tanks (4).

Solution on page 18



News from AQUARISTS' SOCIETIES

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

AT the March meeting of the **Aldersborough and District A.S.**, there was a fish show consisting of two fish, one was of White Herring and the other of Mackerel. Arrangements have been made at the Inter-Club Show on 6th May, to put on a number of trout and salmon fish in colour on Marine Life.

The results of the monthly table show were as follows: Specified class (barb): 1 and 2, Mr. I. Chadwick; 3, Mr. P. A. Watts. Any other variety class: 1 and 2, Mr. K. Emma; 3, Mr. H. John. A.O.V. class (various): 1 and 2, Mrs. J. Dookinsey; 3, Mr. Robinson. Anyone who would like to know more about the society should contact the secretary, Mr. E. E. Harrison, The Highlands, Scotland Lane, Haverthwaite, Leeds.

THE **Journal of the Freeland A.S.**, a bi-monthly issue, is now being read by aquarists in many parts of the U.S.A. and is also being sent out to Russia. Particulars regarding this magazine can be obtained from the Editor, R. A. Thomas, Esq., 54, Derriford Road, Gifford Park, London, N.E.4.

MEETING on Wednesday, 17th March, the **Buntingbourne and District A.S.** held its open house, competing for the coveted "Challenge Cup". The Southern Area Judge, Mr. E. Jervis, F.B.A.S. officiated and in judging the 42 exhibits, complimented the society on the excellent standard and numbers of fish shown. The Cup was presented by its donor, Mrs. E. Lee to Mr. D. Osborne for his ruy bar. Mr. E. Lidinworth, Mr. D. Christian and Messrs. Lee & Collins were presented with memento-um medals.

THE following new officials were elected at the Annual General Meeting of the **Nottingham Tropical Fishkeepers Society**: Chairman and show secretary, Mr. J. Mills, 12, Spinaux Close, West Bridgford, Nottingham; vice-chairman, Mr. E. Pease; social secretary, Mr. J. Alton; treasurer, Mr. J. P. Hart; committee member, Mr. A. Cox. The new secretary is Mrs. D. P. Fair, 57, Harleford Road, Birstwood Park Estate, Nottingham.

New members would be very welcome, and a very good programme has been arranged for future meetings. These include: Lectures, fish and an Inter-Society Competition with Mansfield and District A.S.

AT the last two meetings of the **East London Aquarists and Pondkeepers' Association**, the lectures were given by club members. At the first meeting in March was a lecture by Mr. Bill Corry on the Spawning habits, etc. of the eel, giving a talk on carp. This was a very interesting talk and all members were able to learn something about this wonderful family of fish. Mr. Corry brought along several specimens, such as eggs which were still on the nylon netting on which they were spawned, by at 2 weeks old and several parent fish. At the second meeting, Mr. R. Dodkin's talk was on "The Construction of a Pond." It was obvious that a lot of time and hard work had gone into the composing of this lecture, as he brought to light all aspects of pond construction, including fresh water and standpipes of each type. Both members are to be congratulated on giving such rapt lectures. At the general meeting afterwards it was announced that an outing to the Southern Aquarists had been arranged for 2nd May and this to incorporate a tour of the Bath Ponds. It was also mentioned that the arrangements for the annual show on 25th September were now in full swing. The Hall has been booked for the next Dinner and Dance, also speakers have been booked for future meetings on the following subjects: Filtered aquaria, livebearers, tilapia, Anabantus, water and the aquarist, plants. Table shows start with the first meeting in May, and it is hoped that an Inter-Club table show with Stamford will be on the 15th June.

MEMBERS of the **Poole A.S.** held a general meeting on the 3rd March. The speaker for the evening was Mr. M. Mason who gave a very interesting talk illustrated by coloured slides on the breeding of the primachromis. On the 17th March, a table show was held for livebearers, the judge being Mr. J. Smith of Portsmouth. While the fish were being judged a very interesting talk was given by Mr. J. Sillwell on the keeping and the best breeding of the livebearers and the genetic effect of crossing them. The results of the table show were as follows: Specified: 1 and 2, Mr. N. Franklin; 3, Mr. H. Warren; 4, Mr. Brown. Plants: 1, Mr. N. Franklin; 2, and 3, Mr. P. Carleton. Molluscs: 1, Mr. Sillwell; 2 and 4, Mr. Tyler; 3, Mr. E. Warren. Male guppies: 1, Mr. Gould; 2, Mr. Waterbottom; 3, Mr. P. Carleton; 4, Mr. Smith. Female guppies: 1, Mr. P. Carleton.

THE **East Dulwich A.S.** held an Inter-Club show recently and **Freeland of New Cross** were the visiting Club. The classes judged were livebearers, characins, anabantids, and Mr. G. Jervis was the judge. During the judging, visitors from **Clapham A.S., Freeland and E.D.A.S.** were entertained with a talk on plants and fishes followed by a quiz covering the main talks, all given by three lady members of E.D.A.S. At the conclusion of the quiz the **East Dulwich** show secretary, Mr. R. Salmon, made the awards as follows: Livebearers—1, Mr. A. Thomas (Freeland A.S.) 75 pts.; 2, Mr. A. Gale (East Dulwich A.S.) 77 pts.; 3, Mr. D. Gwynne (Freeland) 79 pts.; 4, Mr. L. Cole (East Dulwich) 78 pts.; Characins—1, Mrs. D. Danvers (East Dulwich) 82 pts.; 2, Mr. A. Birch (East Dulwich) 79 pts.; 3, Mr. P. Gervis (Freeland) 78 pts.; 4, Mr. A. Birch (East Dulwich) 77 pts.; Anabantids—1, Mr. A. Birch (East Dulwich) 80 pts.; 2, Mr. A. Gale (East Dulwich) 77 pts.; 3, Mr. D. Gwynne (Freeland) 78 pts.; 4, Mr. H. Hills (East Dulwich) 75 pts. After the awards had been made the judge commented on the fish he judged, for the benefit of all in the meeting. It is of great assistance to assess who shows fish to have the judge's comment and East Dulwich A.S. would like to take this opportunity of thanking all who have judged at their table and Inter-Club shows for their most valuable contribution to "fish-keeping."

THE annual general meeting of the **Wigan and District Aquarists Society** was held on the 11th March, 1965, when the following officials were elected: Chairman, Mr. T. Whitley (re-elected); vice-chairman, Mr. K. Egan; treasurer, Mrs. L. J. Fryer (re-elected); secretary, Mr. F. Warren; 1, Frederick Brown; 2, Henry Wigan; show secretary, Mr. J. Wilkinson (re-elected).

THE **Blackpool & Fylde Aquatic Society** started their first meeting in February, with a "Who's Who?" programme. This gave members a chance to get to know each other, and tell how they started in the hobby. It proved to be both interesting and amusing, especially when one of the older members told how, on buying his first tank, which was thick with Cryptocorynes, from someone who was giving up fishkeeping, on arriving home, he there them all away because his wife and the larvae were going brown underneath. The second meeting we had, Mr. Grewther acting as Chairman with questions on Tropical Tropical and Trawling fish about the town's landmark.

The annual open show will be held on 26th September. Mr. J. Taylor, 32, Westley Avenue, the show secretary, will supply full details. Results for the two table shows in February were as follows: A.V. tropical or coldwater: 1, Mr. J. Smith (Kirkcaldy); 2, Mr. H. Penfold (R.F.R. sword); 3, Mr. L. Hewitt (Glasgow); Junior: 1, Master R. Gale (London); 2, Master S. Warriner (High Barb); 3, Mr. J. Smith (Luton); 4, Mr. G. Howard (Veston Mill); 5, Mr. C. Jones (Black Platt); Junior: 1, Master S. Warriner (High Barb); 2, Master R. Gale (Black Platt). In the junior table shows there are no restrictions on the variety that they can show.

The club meets at the Victoria Arms, Colburn Street, every second and fourth Wednesday, an open invitation to all visitors to meet as where they will be warmly welcomed is given by members of the society. For any other information, please contact the secretary, Mr. G. Howard, 56, Stamford Avenue, Blackpool.

AT recent meetings of the **Hounslow and District A.S.** table shows for characins and barbs have been held, the winners as follows: Characins: 1, Master Chris. Smith, 90 pts.; 2 and 3, Mr. Thorne (non vote), 89 pts. and a *nananichromis ocellatus*, 88 pts.; Barbs: 1, Mr. Collins (High Barb), 80 pts.; 2, Mr. Hope (London Barb), 73 pts.; 3, Mr. Luff (High Barb), 74 pts. Mr. Thorne has been elected an executive member of the Association of South London Aquarist Societies of which Hounslow is now a member society. Mr. Walters of a Surrey society has given an interesting talk on the breeding of goldfishes fishes and the committee has organized an evening out by coach to a London theatre for all society members.

AT the annual general meeting of the **Bedford and District A.S.**, the officers were elected as follows: President, Mr. Gougeon; vice-presidents, Mrs. Bell, Mr. J. Burke; Mr. W. Daniels; Mr. Pope; Chairman, Mr. K. Smith; Treasurer, Mr. G. Booth; show secretary, Mr. B. Taylor; secretary, Mr. B. Rowdell, 71, Porter Hill Road, Bedford. Committee members, Mr. Jeffs, Mr. B. Smith, Mr. H. Warren, Mr. K. R. Makin, Mr. R. Gorton, Mr. R. McIlroy, Mrs. Clarke, Mr. J. Simpson.

At the Dinner and Dance in February, 95 members and their friends sat down to dinner. Presentations were made by Mr. Gougeon. The following received the awards: Best Trophy for home furnished aquarium, Mr. J. Burke; Gougeon Trophy for highest planted coldwater fish, Mr. D. Angell; Murren Trophy for highest planted tropical fish, Mr. J. Wells; Cassin Trophy for best home bred, Mr. H. Thompson; Award for best breeders pair, Mr. D. Angell; Awards for accomplished points for table shows: 1, Mr. K. Thompson; 2, Mr. A. D. Jeffs; 3, Mr. D. Angell; Award for the aquarist of the year, Mr. E. Thompson. On 9th March, Bedford visited our Home Society, Northampton for an I.M.A.A.B. meeting. We were joined by Corby, Luton, Dunstable and visitors from Buckingham. Fish for the table show of the evening was

A.V. hatch's and prize cards were won by: 1. Mr. Percival (Northampton); 2. Mr. Wells (Bedford) and shared 3. Mr. Percival (Northampton) and Mr. Bamberwhite (Bedford).

A HOME Aquaria competition has recently been held by the **Hildest and District A.S.** for which a challenge Silver Cup was presented to the winner. Eighteen tanks were judged and the results were: 1. A. Wilkinson; 2. F. Hall; 3. T. Durrant and the judge was the club chairman, Mr. L. Thomas.

Although this club was formed only last July, the membership now stands at 45 and continues to increase.

THE annual general meeting of the **Harrow and District Aquarium Society** was held recently, when the officers and committee for the coming year were elected as follows: President, F. Truitt; vice-president, J. Wood; secretary, E. Knight; treasurer, W. Lane; committee, R. Barlett, D. Haylett, E. Allmark, D. Gray and E. Higginson. In spite of a heavier than usual expenditure, last year still proved a profitable one.

The question of attracting new members, again led to discussion. The general opinion was that there were many aquarists in the district who were not aware there was an aquarium club in the town and that some publicity should be given to the society. Any person interested can obtain full particulars from the secretary at 8, Malton Crescent, Harrow-in-Parsons.

THE **Cauford A.S.** open show 1965 is to be held on Saturday, 5th June at Millbeach Road, School, Cauford, S.E.6. There will be over 20 classes and full details and entry forms can be obtained from the show secretary, Mr. K. J. Owen, 42, Elmer Road, Cauford, London, S.E.6.

INCREASED membership which resulted in subscriptions nearly double those of the previous year, was reported at the annual general meeting of the **Derwent Aquarist Club** at Derby in March. A well-attended programme of lectures by prominent aquarists and judges, two (1964) a "Missisquoi Nigler" conducted by Mr. W. Harold Cotton of Birmingham; a "Ladies' Night" Table Show; film; etc., drew satisfactory attendances. Despite increased expenditure, the Treasurer (Mr. T. Swinborn) reported a balance in hand.

The Librarian (Mr. W. Gwynn) said there were some 40 books in the Club's library, covering every aspect of fish-keeping, including marine.

Officers appointed were:—Chairman, Mr. S. Youmans; Secy, secretary, Mr. H. P. Finch, 8, Hale Street, Derby; assistant secretary and show secretary, Mr. A. Adley; treasurer, Mr. T. Swinborn; Librarian, Mr. W. Gwynn. Committee—Messrs. Youmans, Finch, Adley, Swinborn and D. R. Gates, with Mr. R. J. Hallam in place of Mrs. A. Turner, resigned for family reasons.

AT the first March meeting of the **Therrock Aquarist Club** held at Grey Lane Hall the chairman, Mr. R. Nicholls, gave a very interesting talk on the anatomy of fish. He pointed out the usage of fins for propulsion, stability, etc., also the use of swim bladders, scales, etc. This talk was enjoyed by all Club members. At the second meeting a table show was held for fighters. There were 21 entries, including blues, roos, greens and Camboians. The results were as follows:—1. Mr. R. Nicholls, red (53 pts.); 2. Mr. D. Durrant, red (50 pts.); 3. Mr. D. Durrant, red (77 pts.).

THE new executive of the **Association of South London Aquarist Societies** is as follows:—Chairman, F. G. Glynn, Esq.; hon. secretary, K. A. Saunders, Esq.; hon. treasurer, S. Shield, Esq. Committee—Mrs. N. Cartie (Assistant secretary), F. Thomas, Esq. (Journal editor), D. Greenfield, Esq. (Newsletter editor), G. Gale, Esq. All correspondence to the

Association should be addressed to the secretary at 24, Barber Road, Battersea, London, S.W.11. The Association will be holding the annual show on Sunday, 13th June at Crawley College.

THE **East London Aquarist and Pond-keepers' Association** will be holding their annual show on the 25th September, at the Central Hall, East Ham, E.6. There are open classes for breeders, plants, individual furnished aquaria and club furnished aquaria. The "Arnold Trophy" for best club furnished aquaria, this year includes tropical and coldwater aquaria. Schedules can be obtained from the Show Secretary, Mr. W. Barnage, 41, Boundary Road, Barkingside, Essex.

THE annual dinner and dance of the **Hendon and District A.S.** was held on Friday, the 5th February and over 87 members and their friends attended. Special guests were Mr. and Mrs. A. Barden, Mr. and Mrs. E. Palfrey, founder members Mr. and Mrs. E. Riddie and the Society's president and his lady, Mr. and Mrs. R. Slingsby.

After the dinner, two of the Society's most coveted awards were presented and are to be held by the recipients for the next twelve months. Member Frank Oliver received the president's trophy, an engraved silver platter, for his outstanding "club spirit". Chairman Arthur Sutton was presented with the Thomas trophy, a carved stone mazer founded in memory of one of the society's members, for his efforts to further and benefit the hobby.

One person who had made a special effort to be present at the Society's social function was the chairman's lady, Mrs. A. Sutton who had returned only the day previous from a rather long spell in hospital. To celebrate her return she was presented with a large bouquet.

FOLLOWING a meeting of the officers of the **Midland Association of Aquarists' Societies** and the committee of **Gloucester, Keen and Northfield A.S.** it was agreed to stage the 1965 Midland Aquarist Convention and Open Show at O.K.N. Atlas Works Centre, Danlenton, Staffs. on Sunday, 26th May.

The facilities to be made available for the convention, by kind permission of the management of Glouster, Keen and Northfield, Ltd., are most spacious and excellently appointed and will include a refreshment buffet. Arrangements are going ahead to include in addition to the open show the attendance of well-known lecturers and a film show.

THE venue for meetings of the **Sheffield and District A.S.** has been changed. Meetings are held on alternate Friday evenings in the **Liversey-Clegg House**, 21st St. Temperance League, 44, Union Street, Sheffield, 1, at 8 p.m. Prospective members and visitors are welcome. Further details may be obtained from the Secretary, Mr. R. E. Galloway, 71, Bent Lanes Avenue, Rotherham.

THE **Newcastle Guppy and Livebearer Society** held a furnished table show which is becoming a popular and a very competitive event. This was judged by Mr. S. Fox who afterwards gave a very interesting talk and demonstration on propagation of plants, followed by any questions. The results of the show were: 1. J. Reid; 2 and 3, N. Little. Anyone interested in the activities of the Club should contact R. Skerke, 189, Fossway, Walkington, Newcastle upon Tyne, 6.

NEW SOCIETIES
A MEETING was held in Manchester on the 10th March for the purpose of forming the **Gorton and Openshaw A.S.** There was an attendance of twenty, and there was plenty of enthusiastic support. Further meetings will be held in the Angel Inn, 37, Walkington Street, Gorton, Manchester, 16, every second and fourth Wednesday at 8.30 p.m.

The following officers were elected:—Chairman, Mr. V. Wood (treasurer), Mr. A. Thomson; secretary, Mr. J. McQuinn, 36, Railway Street, Gorton, Manchester, 16.

Anybody who is interested should attend the

next meeting or contact the secretary, and can be assured of a warm welcome.

A CLUB has recently been formed at the **Acacia Energy Establishment**, Widsath, in Dorset, as a branch of the Staff Social Club. Club members meet in the lunch break and the following have been appointed as committee members: Mr. A. F. Brooker, chairman and Mr. N. Bevis, secretary. Equipment for the club has been provided by members and a number of tanks are already in operation. Present commitments include the installation of a 4 ft. 6 in. tank in the Establishment's Social Club. Any club who feel they have useful information that would benefit this club is asked to contact their secretary, Mr. N. Bevis.

A NEW Society has been formed, named **Tropical Aquarium Breeders**, as the name suggests it consists only of experienced aquaria breeders, from various societies and the officers and their societies are as follows:—Chairman, Mr. J. Turner (B.A.S.S., A.U.L. and D.A.S.); secretary, Mr. C. Walker (D.A.S.); 65, Springwood Hall Road, From Hill, Guildford; treasurer, Mr. H. W. Hughes (B.V.A.S.); overseas correspondent, Mr. G. Richardson (A.K.F.A. and B.V.A.S.); show secretary, Mr. Halsey (O.D.A.S.); F.N.A.S. delegate, Mr. P. Wilson (A.K.F.A.) and Mr. J. Allan (F.G.A.).

RECENTLY the **Independent A.S.** held a table show for the following four classes. Winners were as follows:—Anguis; 1, Mr. J. Kettle; 2, Mr. J. A. Chapman; 3, Mr. J. Clarke; 4, Miss A. Kevlin. Fighters: 1, Mr. J. Chapman; 2, Mr. J. Clarke; 3, Mr. F. Tomkins; 4, Mr. J. Rooks. Dames, rabbits and W.C.M.M.: 1 and 2, Mr. J. Clarke; 3, Mr. F. Tomkins; 4, Mr. J. E. Chapman. A.O.V. (breeders): 1, Miss A. Kettle; 2 and 3, Mr. J. Kettle; 4, Mrs. G. Barnard.

This competition was followed a week later by the single fish championship for the Kettle trophy, presented for the first time in 1963 by Mr. J. Kettle (Independent A.S.). A very good entry of fish was recorded, all exhibiting the best fish the owner possessed, and after a lengthy summing up of all the different species on the bench, a thinking programme owned by Mr. F. Tomkins was declared the winner. This type of competition not only brings to light the odd or rare fish that members hide away in their tanks, but gives the show with only one compulsory tank, a good chance of placing the trophy on his sideboard, even though he doesn't appreciate.

Crossword Solution

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

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POSTAL SERVICE



TROPICAL FISH

Interesting fish this month

South American Livebearers
 Hybrid Blue Mollies 2" 15/- pair
 Platy Varietas 7/6 -
 Large Sail Fin Black
 Mollies 37/6 -
 Black Body Red Veil
 Guppies (Gambusia
 Virgin Fawcett) 95/-

Red Wagtail Swords 12/6 pair
 Harlequin Varietas
 Platys 17/6 -
 Golden Guppies 4/-
 Red Swords 11/6 -
 Anemostomus Anemostomus
 27/6 each
 Bleeding Hearts 12/6 -

French Small
 Puntanus 10/6 each
 Corydoras Elegans 12/6 -
 Corydoras Katsui
 Adult 12/6 -
 Electric Codfish 35/-
 Blue Galera Unstack 12/6 -
Egg Layers
 Sword Fish 12" 42/-

Good size Albino
 Tiger Barbs 4/- each
 Good size Tiger Barbs 5/-
 Black Cardinals 7/6 -
 Walker Cats 12/6 -
 Blue Galera 45/- pair
 Elephant Nose 35/-
 Exodon Paradoxus 29/-
 Orange Chromides 4/-
 Pseudorasbora 12/6 -
 Simpson Red Wagtail 12/6 -

TROPICAL FISH LIST MAR/APRIL REGULAR STOCKS ARRIVING WEEKLY

LIVEBEARERS

Guppies
 Fancy 12/6 pair
 Assorted 3/-
 Lace Guppies 4/-
Swordtails
 Red Standard 14 each
 Red Large 14 -
 Green 18 -
 Red Wagtail 18 -
 Torpedo 18 -
 Red Eye Red 4/6 -
 Golden 4/6 -
 Singapore Red 12/6 pair
 Green Lorient Mollies 7/6 each
 Lemon Guppies 15/- pair
Platies
 Red 3/- each
 Black 3/-
 Torpedo 3/-
 Comet Tail Yellow 3/-
 Red Wagtail 3/-
 Yellow Wagtails 3/-
 Varietas 7/6 pair
Mollies
 Black Lyretail 5/-
 Black 3/-
 Moonlight Fish 2/6 -
 Hill Beaks 2/6 -

Black Neon 3/- each
 Bloodline 2/-
 Pungus (Beak) 4/6 -
 Harlequin Mollies 7/6 -
 Nannostomus
 Marginatus 4/-
 Nannostomus Anemalis 3/-
 Nannostomus
 Trilineatus 8/6 -
 Copeius Anemalis 7/-
 Cosmos Guppies 5/6 -
 Moenkhausia Picta 5/6 -
 Red Eye Characin 21/-

LABYRINTHS

Siamese Fighting (males) 18/-
 Siamese Fighting (females) 4/-
Gourami
 Thick Lip 3/-
 Dwarf 2/-
 Three Spot 2/6 -
 Opaline 2/6 -
 Pearl (Large) 3/6 -
 Kissing 5/-
 Jewel 5/-
 Honey 8/6 -
 Purple Fish 3/6 -
 Moonlight Gourami 12/6 -
 Adult Dwarf Gourami 10/6 pair

FANCHA GROUP

Fanchax
 Day 4/- each
 Liveout 4/6 -
 Claret Orange 4/6 -
 Throat 4/-
 Playful 4/6 -
Aphanipterus
 Veulter 10/6 pair
 Calbaricus 14/6 -

RASBORAS

Horobius 2/6 each
 Forest Rasbora 4/6 -
 Silver Tail 3/6 -
 Rasbora Kalichroma 7/6 -
 Rasbora Deroceles 3/6 -
 Muraebora 3/6 -
 Rubescens 2/6 -

BARBS

Tiger 2/6 each
 Nigger (adult full set) 7/6 -
 Tico 2/6 -
 Cherry 2/6 -
 Nigger (Small) 2/6 -
 Dasher 17/6 -
 Torpedo 5/-
 Roy 2/6 -
 Half Banded 2/6 -
 Golden 2/6 -
 Summer G.S. 4/6 -
 Clown 5/6 -
 Archer 4/-
 Vintus 5/-
 Barbus Galus 5/6 -

CATFISH & LOACHES

Corydoras
 Macrochirus (Dwarf) 6/-
 Macrochirus 10/-
 Palatine 6/6 -
 Anas 4/6 -
 Anas (Large) 8/6 -
 Melanostomus (Large) 8/6 -
 Arcuatus 10/6 -
 Glass Kivi 3/6 -
 Glass Cat 3/-
 Japanese Weather Fish 7/6 -
 Khuli Loach 2/6 -
 Ducking Loach 3/6 -
 Aymonnet 7/6 -
 Octodon Albus 7/6 -
 Myers (Large) 10/6 -
 Corydoras Full 10/6 -
 Beaufort Loach 8/6 -
 Hyacinth Special 12/6 -
 Bee Cats 5/6 -
 Pseudorasbora 2" 10/6 -
 Pseudorasbora 4" to 5" 11/-
 Horse Face Loach 5/-

CICHLIDS

Angels
 Standard 3/-
 Lace 2/6 -
 Lace Veilout 7/6 -
 Veil 7/6 -
 Black 4/6 -
 Black Veil 15/-
 Jewel 4/6 -

Convict 2/6 each
 Festive 3/6 -
 Harle 7/6 -
 Firemouth 3/6 -

DWARF CICHLIDS

Kribia 10/-
 Nannostomus Anemalis 7/6 -
Apistogramma
 Agassiz 5/6 -
 Setaji 9/-
 Ramirezi 5/6 -

DANIOS

Spotted 2/6 -
 Glass 2/6 -
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continued on page xviii

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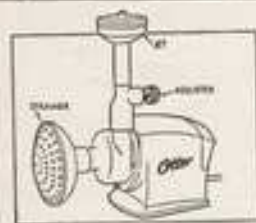
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