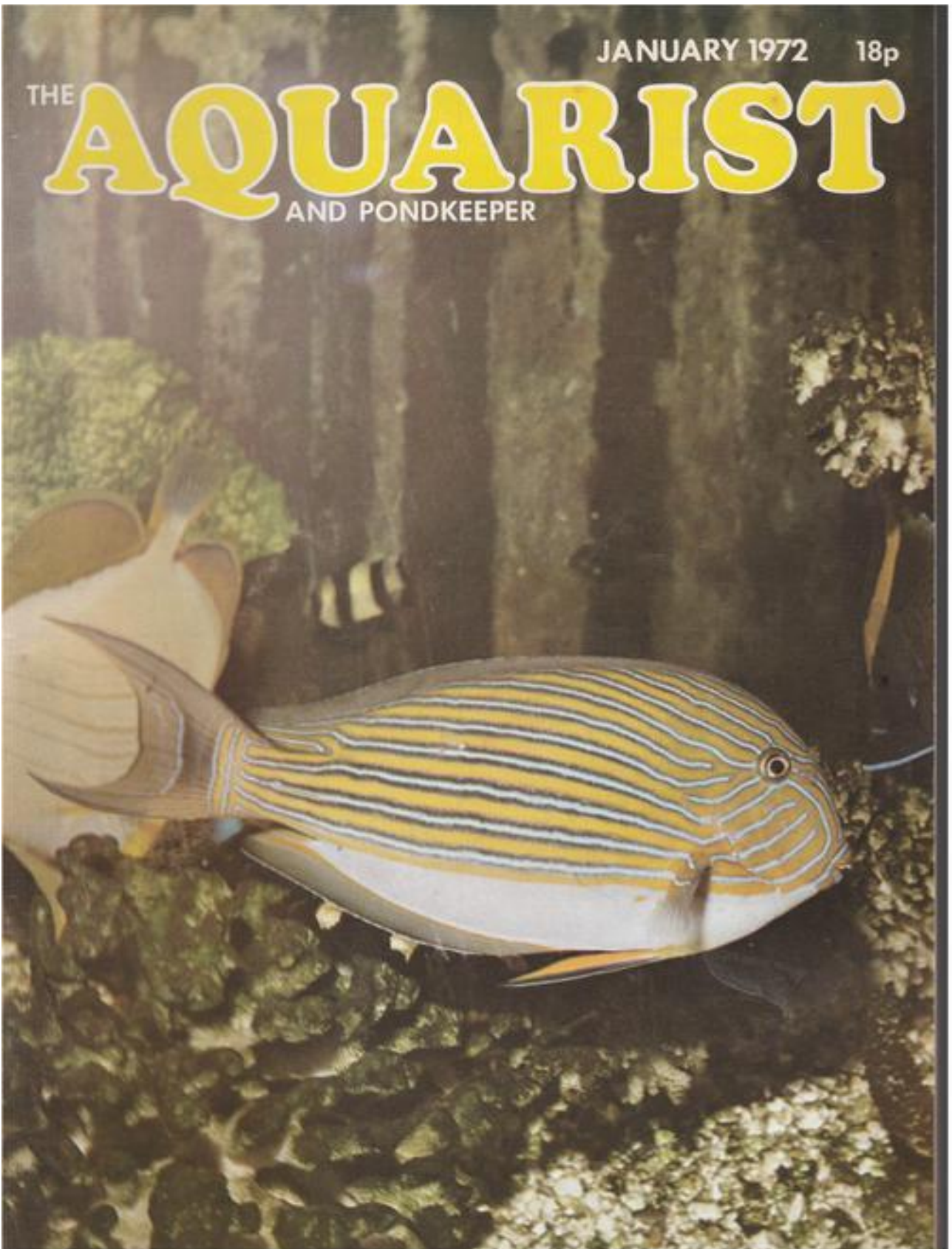


JANUARY 1972 18p

THE **AQUARIST**
AND PONDKEEPER





Cottus scorpius

OUR NATIVE SCORPION FISHES

by Graham C. Robertson

MOST MARINE AQUARISTS must have seen the magnificent tropical scorpion fishes such as *Pterois volitans* or *P. radiata*, but what are our own native scorpion fish like?

There are two species to be found on our coasts. The first is *Cottus scorpius* (Fatherlasher, short-spined sea scorpion) which grows to about 9 in. in length. It is a rather squat fish having a large head which has two small spines on the snout and three or four short spines on the front gill-flap. Its colouring is variable, usually brown, but can be red or even grey. Its dorsal surface is mottled while the ventral surface is a uniform white or yellow.

The other species, *C. hubalis* (long-spined sea-scorpion) is very similar to *C. scorpius* but is a little smaller, about 6 in. long. It has two ridges on its forehead and four strong spines on its gill-flap. This species also has one or two small barbels at the corner of its mouth. Another notable feature of the scorpions is their very large, fan-like pectoral fins.

They are mostly found in pools with overhangs of rocks or crevices and with sides which are well covered with seaweed. This can make them difficult to catch as they can easily hide. It is, however, possible to drive them from their cover by using two nets, one being pushed along the pool bottom while the other is held in front of it, thus forcing the scorpion into the second net.

When first introduced into an aquarium they will

try to hide but soon settle down and show themselves more often. They are happier if there is a lot of rockwork about and will rest motionless for hours blending perfectly into their background.

At feeding time, though, they are capable of showing amazing burst of speed. As they are predatory fish it is obviously best to feed them live food but this is not absolutely necessary. My specimens are fed mainly on cooked fish and freeze-dried *tubifex*. Scorpions have large mouths and quite big pieces of food can be dropped into the tank beside them. They will watch it falling through the water and when it is a short distance away they will dart forwards and swallow it in one gulp.

I once had a small scorpion about 1½ in. long and in the same tank were about a dozen small sticklebacks approximately ½ in. long. The scorpion would lie on a rock and his eyes would be seen to follow the shoal of sticklebacks around the tank. If an unfortunate fish swam too close he would make a lunge at it and occasionally he managed to catch and devour one.

Our native scorpion fishes make excellent community fish providing the other fish in the tank are too big to be swallowed, and I have yet to see them harming invertebrates. Although not particularly attractive fish they have a strong personality and can be thoroughly recommended.

FROM OUR OWN SEASHORE

by Linda Gwilliams (aged 15 yrs.)

DURING the last day of our annual summer holiday in August, my parents and I went to Eastbourne beach in the hope of collecting some British marine creatures. We got up early to be at the beach at low tide (we had checked the time of low tide the day previously).

As we walked down to the rock pools, the beach seemed deserted of life, but at a closer look the rocks were covered with beadlet anemones; they did not look like anemones at all as their tentacles were drawn in, looking like lumps of wet red or green jelly. I collected eight of these; as some were stuck so firmly, I had to take the stone they were on as well. I put them into a large plastic bag and after a few minutes they slowly began to open out. I also collected seven prawns. I put these into a separate plastic bag in case they might be stung by the anemones in a small space. I also collected several periwinkles and limpets, and two mussels, which had many acorn barnacles on them. I also included a very small green shore-crab. Before I left I took a hydrometer reading of the seawater, which was about 1.026 to check that the creatures would be in the same density in the tank at home. As it was rather hard to blow air into the large plastic bags; we called in on a garage and used their airline.

When we arrived home, the bags were floated on top of the water. I took a hydrometer reading of the tank water and had to add a little more freshwater.

The tank I used was a 24 x 12 x 12 in. sealed with

silicone; it contained an undergravel filter covered by an inch of white gravel. For seawater I used a bag of synthetic salt. For decoration I used rocks, shells and some coloured sea fern. I also put in some green seaweed *Enteromorpha clathrata* and some horn-wrack. I filled the tank two inches from the top so that more oxygen could circulate, the periwinkles then have somewhere to come out of the water as they seem to spend more time out of the water than in.

Once a week I check the density. In warm weather I usually add a cup or two of fresh water to allow for evaporation. The anemones are fed twice weekly on *tubifex* worm. The prawns eat *tubifex*, seaweed and brine shrimp, which is hatched out in the tank. The crab eats almost anything, but prefers *tubifex*. Since I had him he has grown from a quarter of an inch to nearly two inches long. Many of my anemones have produced live young which are now growing quite fast. At first sight this cluster of young anemones looked like *tubifex* worms waving in the gravel. After giving birth, the adult anemone looks very tatty, but within a day she is back to normal.

Once a day the tank-bottom is cleaned with an air-operated syphon for any dead *tubifex*. Since I set up this tank only one mussel and one or two periwinkles have died.

I think anybody who would like to keep tropical marine fish should first get experience with British marines as they are quite hardy and interesting, inexpensive to set up and easy to feed.

Find the Rare Plants

by Hiliary Maynard

My first is in RUBBISH but not in waste,
My second is in TOUCH but not in TASTE.
My third is in FILTER and also in STRAIN,
My fourth is in SUNSHINE and also in RAIN.
My fifth is in LIVER but not in OIL,
My sixth is in EVAPORATE and also in BOIL.
My seventh is in WATERFALL but not in LAKE.
My eighth is in GIVE and also in TAKE.
My ninth is in AQUARIUM but not in TANK,
My tenth is in LONG and also in LANK.
My last is in CLOTHES but not in GEAR,
My whole are attractive—and not very dear!
Answer on page 335.

B.K.K.S.

The BRITISH KOI-KEEPERS' SOCIETY held an informal meeting in London on 31 October when a number of new members were welcomed.

A most interesting talk on the techniques of breeding Koi in Great Britain was given by Mr. Lionel Vanderplank.

Consideration was given to future meetings including a rendezvous in the Birmingham area for the special benefit of Midland and Northern members.

Details of the British Koi-Keepers' Society may be obtained from the Secretary: MRS. H. ALLEN, 1 Anthony Close, Francis Gardens, Peterborough. (Telephone 67997 Peterborough.)

DISCUS

NOTES ON LIGHTING, FEEDING TEMPERATURE AND DISEASE

by R. H. Cooke

ONE EVENING in 1948, 23 years ago, I pushed my head round the fish house door of the King of Angel Breeders, Mr. Jim Ralph of Colchester. Jim was a rugged man with the gruffest voice I have ever heard. He was also exceedingly gentle and kind for a man of such strength and daring as before making a small fortune out of breeding Angels, he could be found in the building trade, working on towers or steeples where all other feared to venture.

I had been conducting a private survey on the sterilisation of reservoirs by Ultra Violet and Jim suggested that I lecture the local club on this topic and, being keen, I accepted the offer. However, when the dreaded evening arrived I was only scantily informed on the subject. I can't remember to this day how I got away with it. Jim seemed to think I had done O.K. but I felt literally cut to ribbons by the searching questions put to me by doctors, lawyers and other learned members of the club. It took me a further 23 years to prove my point to my own satisfaction if not to many others.

That evening first mentioned, I happened to glance into a tank which contained two large Vertical Flat fish of breathtaking beauty. "Oh, I must have some of these Jim," I said. "How much?" £60 a pair, I think he said. The impact of the price on someone earning £5 10s. a week with overtime caused a temporary blackout and loss of memory. I knew what Jim had in mind; his tenacious research into Angel breeding and success had inspired him with greater confidence. If he could do the same with these fish the rewards would be without bounds. "What do you call them Jim?" I said. "Pompadours, my boy," came Jim's always casual reply.

Neons were costing me £2 10s. at that time so I wished him good luck and pressed on breeding Glow-lights, Zebras and Mountain Minnows.

I called on him a few weeks later and the Discus were dead. I believe he tried Discus again as he was not a man who would give up without a fight, but his tanks which teemed with baby angels were never seen to contain Discus.

Feeding and disease are the nightmares of the Discus hobbyist and, like cancer in human beings, little is known concerning the cures. As odd as it may sound, the prevention of disease and sickness in all living things is health, and if you approach the problem with this aim much can be accomplished.

You know, I really do chuckle when I see spread across the newsprint: "Local bigwig opens massive new hospital." What a terrible admission of medical failure. How much more impressive if we could read: "Owing to the enormous improvement in health, local bigwig gives orders to pull down massive hospital as it is no longer required." Fight the cause and prevent the disease. When your Discus are sick you have doubled your problem; you have now to find the cure and the cause. First, let us consider lighting; I would suggest that you place your tank or tanks in a quiet corner where the strong light from the windows does not fall directly upon them, especially where such light strikes the tank at an oblique angle. If you do, you will find that the fish will take up a swim position coincident with such light and the effect is most unnatural. Natural light directly overhead calls for the removal of the roof and aquarium cover, so unless you do it all with mirrors you are faced with artificial lighting. No matter what kind of light is adopted some measure of control must be placed over it. Ordinary electric light bulbs provide for the easiest manner of control. However, as the voltage is reduced the visible light swings towards the amber end of the spectrum which, although well tolerated by the fish, is not appreciated by most aquarists. The methods available for incandescent light control are:

- (1) A variable resistor of adequate wattage dissipation.
- (2) A variable transformer or variac.
- (3) A transistorised dimmer (waveform chopper).
- (4) Series/Parallel connecting with a switch.

Let us consider the merits and disadvantages of each:

- (1) A variable resistor has to be housed in a perforated housing to dissipate the heat as you turn

it down. This heat is wasted and therefore is not much of a money-saver on the electricity bill.

- (2) A variable transformer or variac is rather expensive for the amount of current control liable to be required. However, it can be over 80 per cent efficient and should be considered as a possibility.
- (3) A transistorised dimmer is rather expensive also; it contains numerous small components which may give trouble and it may also cause radio or television interference owing to the sharp waveform peaks at minimum light settings. However, it is a money saver, since very little waste occurs,

require sufficient light to see their food and live happily, particularly in the evening. I have found that all the Discus I have kept show most interest in food between 6 p.m. and 10 p.m. However, that phenomenon may be associated with the control of my lighting.

Ordinary fluorescent tubes produce bright and pleasing conditions of light but watch out for *algae*, which should never be allowed to grow. Not that I object to *algae* but as *algae* appears so do dozens of other unwanted microscopic life-forms. You cannot control this type of light with simple dimmers as you can incandescent bulbs; they require a minimum voltage to strike and a minimum current to maintain



Top left, the famous "Tiny" twice given up for dead, now enjoys a sterilised tank. This fish, no bigger than a tenpenny piece when purchased, has been through all the writer's experiments. "Dozey," a gorgeous red, is a recent addition to the family. Right, "Buff-Hello-Bill," a specimen fish from Five Fishes Aquaria. Bottom left, "Mr. Hyde" — hides again

It can be manufactured at home by the enthusiast (circuit provided if required).

- (4) Series/Parallel connections of light bulbs involve little cost, the disadvantage is only two available light levels (unless you use four bulbs) together with the fact that when you connect two bulbs in series you only dissipate one-quarter of the available power and related light output which is amber in colour.

You can use Gro-lux lighting and control the unwanted growth of *algae* by switching it on only for restricted periods. Do not forget, however, that the fish

ionisation within the tube to provide sufficient emission from the heaters at the tube ends. One of the most interesting experiments with light is an attempt to create artificial moonlight. I have a couple of wall-lights in the lounge mounted against a dark green wall, the effect, quite accidentally, is a soft light of moonlight appearance. We get most pleasure from the fishes late in the evenings (after they have been fed and have rummaged the gravel for the last scraps of food) by turning out the tank lights and watching the fish scamper about like alley-rats, thoroughly enjoying themselves. The light is not powerful enough to cause

them to change their natural vertical swim attitude and we never put the lights up again before retiring.

A point of interest is that if you do use light for the purpose of growing plants a bright light for a short period is not the same thing as a restricted light for a longer period. The use of lights unnecessarily bright I believe to be unkind to the fish and produces an uncontrollable growth of *algae*. The best results I have ever achieved for plant growth and health in a community aquarium (not *Discus*) occurred in one built up with plenty of slate caverns for fish to shelter from light and where the lights were turned down at night to cast a glimmer and not turned off completely.

particular parasite to prevail. It horrifies me to see the amount of chemicals that are poured into tanks at the first sign of white spot; all one has to do is to turn up the temperature to 85°F for two weeks and forget about it. This lesson I learned from Jim Ralph back in the nineteen-forties. While I was pouring quinine hydrochloride and methylene blue into my tanks, Jim carried on without losses with the temperature cure. My fish must have been in poor health to contract the disease and now being weak died from the effect of the chemical. Those which were healthy were made weak by the chemicals and so contracted the disease and so it continues until Mother Nature lifts her hand and says



The right way to keep *Discus*: plastic plants in movable pots allow for adequate cleaning

In some quiet areas where there are few if any street-lights, the seclusion of one's home can produce almost complete darkness in the night especially during winter. This state is just as unnatural as leaving the lights on all night. Community fish in such darkness have no escape from predatory species and pick up any parasites that may be around during these hours. You may say you should not have parasites in your tank, but we all get them at some time (stop scratching, grandma). I would not suggest that a glimmer of light through the hours of darkness has any control over a parasitic infection of the tank but I have noticed that where fish are plunged into total darkness, outbreaks of white spot are always noticeably worse in the mornings. Now with *Discus* you will never get white spot because the temperature will always be far too high for that

stop. We now have the correct amount of fish per gallon of water and water surface to air, which may be only one or two fishes in a twelve gallon tank. Always use nature's own cures if possible. As a last resort, and only as a last resort, turn to medicine for help; remember it is you that provides the cause for disease, so look to the cause. For example: tank sanitation; decaying plants being eaten by bacteria and other more vicious animals eating the bacteria and the fish, overcrowding, overfeeding, more bacteria eating the food the fish leave, pollution upon pollution. The water must be crystal clear. Look through your tank from end to end. If you see water there is something wrong with it. To support Mr. D. K. Brown's statement of fish shrugging off disease, I recently introduced two Loach into a community aquarium which had ultra

violet sterilised water and good sanitation. Both fish had white spot. I intended to pay extra attention to that tank but as I was running an experimental Discus tank with sick imported fish costing thirty pounds of our hard-earned money, I overlooked it for a couple of days. Now what usually happens in such cases is that the family, who also share in the expenses, call out "Dad, you blithering old idiot, you've let white spot into this tank." No such cries of rage were heard so I crept to the tank some days later with a magnifying glass to survey the havoc. Not a sign of trouble. Now if you can find a way to plumb in flush lavatories in your tanks and teach the fish to use them, many of your problems are over.

With Discus you get plenty of warning when things are not the way they should be. The temperature should be a minimum of 83°F and preferably set at 86°F. I know a dealer who keeps his Discus consistently at 90°F which is good sense if you want to keep out of most troubles. They are quite happy at that temperature. However, I prefer to keep Discus at temperatures slightly lower than this. Evaporation is colossal at such temperatures, and I find that the fish do not consistently show their best colours at temperatures above 87°F. When I decided to specialise in Discus I did not, at that time, intend to run experiments on disease. However, I am pleased I have, for the results are most encouraging. I have proved that, like the little neons which were my love 20 years ago and which still have a place in my heart and in my tanks, the Discus is a tough fish. We bought three small browns which the family named Bulley, Stripey and Tiny, the last obviously the smaller of the three. My son liked him or her because he was well coloured and darker than the others. In truth, Tiny was sick and in a few days showed the unmistakable signs of the characteristic white puffs which indicate the beginning of trouble. I should add at this point that the origin of these fish was uncertain and the menu was said to be white worm. The water in which they were delivered was certainly soft and slightly acid. However, there was little doubt in my mind that they were imported Brown Discus. Less than forty-eight hours after the outbreak on Tiny, Bulley showed similar signs of infection and I realised that something would have to be done if we were to restore them to health.

I thought at this time, having read considerable literature on these fish, that they were probably delicate and therefore studied to the best of my ability the effects of antibiotics and non-toxic drugs. I decided that terramycin should be my first choice, hoping that the infection was bacterial rather than parasitic. Certainly the symptoms of disease subsided after three days in a solution of 50 mgms per gallon of the drug. Bulley and Stripey continued to grow slowly but Tiny, although eating, remained dark in colour and would hide up for long periods behind the thermostat. This fish started

to lose weight until his eyes resembled a telescope fixed at right angles across his head. I was ready for further experiments with an Ultra Violet Steriliser at this time and moved Bulley and Stripey into that tank together with a half grown wild brown. These three Discus grew at an amazing rate in the ultra violet sterilised tank. In the meantime we purchased two small blues as pals for Tiny as, convinced that we could not save him, the family did not like the thought of him facing the end alone. My sons cleaned the spade for digging the inevitable grave. I sat pondering. 30 years of keeping other fish had not taught me the right way to keep Discus. The tank was immaculate now that the terramycin soup was gone. The water was soft and slightly acid. Jim Ralph's words passed through my puzzled brain "temperature, my boy. If you see any spots always increase the temperature, my boy." I removed the immersion thermostat and fitted an external type having first removed the knob by undoing the setscrew and refixing it at half a turn anti-clockwise to enable me to control temperatures in the region of 100°F. The temperature climbed to 97°F and levelled off. The resulting effects on the fish were frightening in the extreme. They became covered in white puffs and patches and we waited, horrified, for the next happening. The happening occurred certainly but not in that tank. A filter connection sprung off in tank 2 one afternoon when we were all out searching for plastic plants and the three little black bodies slumped on the dry gravel on our return marked the end of the services of Bulley, Stripey and Hector. The family went into mourning for a few days until we found the heart to strip No. 2 tank and rebuild what resembled a scuttled ship. Tank 1 containing Tiny had been running between 96° and 97°F for just over a week and the second happening occurred. One morning early, jumping out of bed as customary, I dodged past the lounge window in my pyjamas to see if the four remaining precious Discus were still alive. Yes, they were still vertical and breathing but the temperature was down to 77°F. From 97°F to 77°F in one night nearly caused me to lose a pyjama string. I replaced the broken heater and went to work after setting the thermostat at what I considered would produce about 85°F. That which greeted me when I went home that night I could not believe. Three normal-coloured happy, lively Discus were trying to eat their way out through the glass for food. The always sick Tiny doubled his size in what appeared to be a few weeks and my confidence through luck and misadventure had been restored (temporarily).

I gave the boys the go-ahead on my pipe dream tank that was to fill the whole side of the dining room, at a cost that makes me shudder when I think of it. We set up a medium sized stainless steel tank and went out to purchase a large Heckle and Brown which we had seen. You know, the kind that is imported for about

seven pounds and sold for twenty pounds. The Brown Discus got himself called the "Brown" and Heckle got called Dr. Jeckle because it rhymed with Heckle and anyway he used to "Hyde" a lot.

All the Discus were placed in this larger tank but unfortunately bad manufacture had caused the ultra violet steriliser to burn out which called for more than expected water-changes. We had all been listening a little too hard and too long about the bad things said about *tubifex* worms, so we patiently coaxed the two large fish off their *tubifex* diet and on to white worm, spinach, oxheart, brine-shrimp and chicken. If frozen, spinach, oxheart and chicken can be shredded to a convenient size with a Mouli-grater. Now at this point I must say that in my opinion Discus diets are the key to success. You should have soft water; you should have a low bacterial count in that water; you should have impeccable sanitary arrangements for the fish but you *must* have the correct diet for the fish. The following indicates the importance of this point.

After the Heckle became accustomed to his new food he ate well and initially appeared to be in good health. However, the decline came. Slowly he lost weight until those dreaded puffs appeared. Up must go the temperature, says I, and feeling confident went to bed with the thermostat notched up to 97°F. The morning brought impending disaster. The stainless steel travesty which called itself a tank, with rising heat now had a strong resemblance to a bow-fronted aquaria. How manufacturers can put glass as thin as paper into a bent up, spot-welded piece of tin and call it a tank I'll never know.

Needless to say I dropped the temperature and the water level and called out to my friends for help. It was decided to wait for the delivery of the pipe dream tank as, in the opinion of my friendly pet shop staff, it would hold providing I refrained from my now established cauldron treatment.

In the days that followed Dr. Jeckle the Heckle developed holes behind the eyes and the top of the head. The fish looked as if woodworm were prevalent. I just could not bring myself to watch this fish which had now become part of the family. I had to do something. All the fish with the exception of Tiny and a Blue had contracted the disease. The temperature had to go up. I sucked out more water, turned up the thermostat and prayed. The putty squeezed out of the joints and an inch up the glass, but it now held with the reduced weight of water. The appearance of the Heckle was a disgusting sight as the temperature hovered just under 100°F for three days. I could not shake off this kind of infection. Tiny and the Blue paid little attention to the treatment as I swung the temperature from minimum to maximum lethal in a desperate effort to kill bacteria, parasites, or anything that stood between me and recovery. pH was altered in a like manner together with water hardness, with

little effect. Tiny and the Blue continued to eat and disregard the conditions although they looked at me at feeding times in a way which made me feel they were saying, "what the hell do you think you're doing?" They were immune to the disease so I took them out and gave them a separate tank where the honey-brown Tiny, still in the peak of health, amuses all onlookers with his hula dances which prevent the Blue from feeding. The family argued and discussed the condition of the Heckle and Large Brown; from their septic, shot-up appearance they would have been better known as Bonnie and Clyde.

A white fungus substance protruded from every hole and I waited for the hour of departure. The temperature had been 95°F for over a fortnight and on the following day the white began to subside. The fish had spent much of their time leaning over so that the flat sides of their bodies were uppermost and almost black in colour. The holes in their heads looked cleaner and the Heckle showed a little interest in food. The fishes were now very thin which is not surprising considering their suffering. A few white worms caused the Heckle to move forward an inch and back. As my patience was running out, I decided to put them back on *tubifex*. The next day I came home with some very nice *tubifex* and, after thoroughly washing it, offered the two sick fish a few of the worms. They both ate a few and rolled over flat-side up for a further protracted period. The family now were pressing me to turn to chemicals so I visited a chemist in Kingsbury. Never have I met a man in my life endowed with so much human potential, patience and understanding. A tablet of this or gram of that, weighed out for comparator samples, never a request refused, never irritable, this man has my undying gratitude. I brought home a few odd drugs and hoped that their presence would temporarily satisfy the family. The next morning brought yet another surprise for when I approached the tank with my sieve of *tubifex* they came at me like starving wolves. As I added more worms it would not have surprised me if the Heckle had jumped out of the tank to shake my hand. The puff disease began to disappear as if by magic. However, recurrent outbreaks prevented a positive cure. I was now determined to deliver the *coup-de-grace* to this hated enemy and used the following brew with complete success. With the tank gradually reduced to 90°F, dissolve one gram of copper sulphate in 1 litre of distilled water as stock solution. Use 1½ millilitres of this solution per litre of tank water. Also use 12 milligrams of terramycin per litre of tank-water. Dissolve the terramycin in a couple of litres before adding to the tank. If the reader intends to use this potion, it should be added to the water after the temperature has brought out the disease which should be at least a week after subjecting the fish to a temperature of 95°F. Fish smaller than a half crown piece were never included in the experiment.

After 4 days at 90°F, change 17 per cent of the tank water daily (provided that all evidence of the disease has disappeared). Filters must be disconnected and non-turbulent aeration used as a plentiful substitute. Do not reconnect the filters until all the water in the tank has been effectively changed. During the filter shut-down, this accessory must be cleaned and sterilised before re-use. It will contain germs.

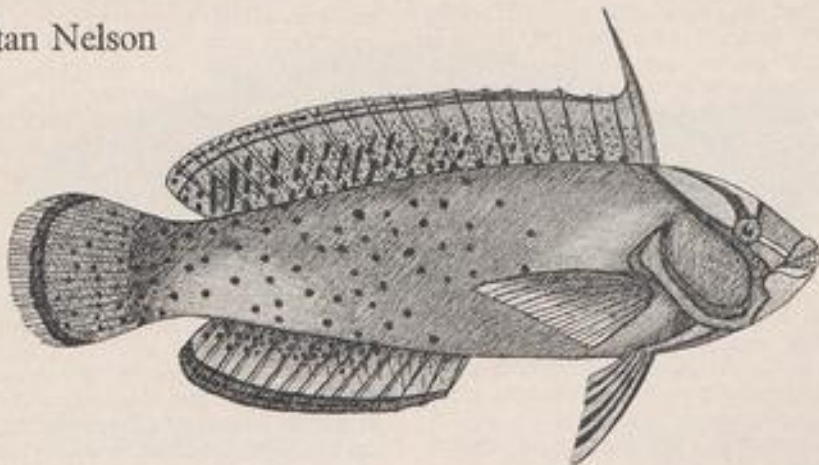
The lesson I have learned is not to remove items

from the Discus menu. Our wild Discus prefer *tubifex*; our tank bred Discus prefer white worm; they all eat spinach (thanks to you, Mr. Brown), they pick over shredded oxheart and spit out most of the chopped earthworm, brine shrimps and chicken.

I eat bangers and mash. The last time I ate over-ripe pheasant and port wine I was violently ill. I will never forget the nasty spots that resulted from that evening out.

SOME COLOURFUL TROPICAL WRASSE

by Stan Nelson



Coris gaimard

My first experience with the Wrasse species happened a few years ago and gave me quite a shock. At that time I knew of no one else who kept marines. I was yet to meet Derek Bevin from whom I learned a lot. Graham Cox's shop was not in existence, and the only book on the market that I knew of was Axelrod's "Salt Water Aquarium Fish" which I bought.

The fish I was receiving comprised whatever my son had the time or the luck to catch with only a few hours to spare off the coast of the West Indies.

I had two tanks set up in the fish house for marines, but kept having trouble which later was attributed to the paraffin heater. This had been in use with freshwater fish for a long time with no trouble at all, but saltwater appears to absorb the fumes and the fish

were being poisoned.

At this particular time I was experimenting with an undergravel filter in seawater and which, I had read in a magazine, was being used successfully in America. I had this tank set up in readiness on the top tier of three tiers in the fish house. When my son docked he brought five fish which were new to me. In his cabin they didn't look either interesting or attractive. They were around four inches long, bodies elongated and curled up in odd positions, lying on the bottom of the tank. Indeed, one was on its side and I thought that all of them were not long for this world. My son assured me that on the voyage back they swam all day and lay like this every evening and that they were eating well. Not really convinced and slightly dis-

appointed for I had been hoping for Rock Beauties or Queen Angels or the like, I packed the five into a plastic bag, thanked my son for all his trouble and headed for home.

The shock was now to come. I had to stand on a chair to reach this top tank prepared for the fish. I opened the plastic bag and allowed the fish to swim out. When the bag was empty I lifted it out upside down, draining off all the water and had a look in the tank to see how the fish were behaving. Instead of five there were only two! Incredible! I hadn't seen any fish jump. I had kept spiny eels and I know they go under the gravel, but the bottom was absolutely undisturbed and surely I'd have noticed them go. So they must have jumped the tank somehow without me spotting it, and must be found quickly. You know how a fish out of water jumps and wriggles and starting on the top tier could now be almost anywhere. I looked everywhere, behind tanks that I could manage to move, on ledges, in the tanks and on my knees I searched the floor under the tanks. I couldn't even find one, never mind three. Looking back in the tank another shock awaited me; the other two had gone! This was too much!—back to the search again. Once more a long search proved to be absolutely useless. Puzzled, I looked in their tank time and again; the water was clear, the gravel undisturbed. Spiny eels poke their heads up, but here nothing was to be seen.

I went to bed despondent that night, not knowing how to tell my son that I had lost the fish so quickly after all his effort.

Next morning I went out to the fish house to put the lights on and fill the paraffin heater, and lo and behold, there were five prettily marked fish swimming actively in the tank. It was a wonderful relief and I realised that they must have been under the gravel all the time.

I can laugh now when I look back, but I certainly didn't at the time.

So much for my introduction to the Wrasse species. Since that time I have had or seen some of the most gorgeous creatures on earth in this group of fishes.

The colour varieties and patterns are amazing; blue, yellow, brown, red, black and a variety of shades and mixtures of colour. Many look as though an artist has been trying his skill on them.

The Wrasse family or Labridae is one of the largest families of fishes in tropical and temperate seas. Not all are suited to aquarium life, some growing too large, and from reports some can be quite nasty and with their very powerful teeth can inflict deep wounds on their tank-mates. Most of the small species, however, are suitable and, in fact, are almost shy, gliding away out of trouble from any would-be aggressor. It is comical if this happens for they hide then poke their heads out first to see if the coast is clear and out they

come again. I've never experienced any trouble with them.

Their method of swimming is odd; swimming normally at cruising speed, only the pectoral fins are used. These beat simultaneously thrusting the fish through the water and the tail is used only as a rudder. When, however, the fish changes to top gear, the body and tail muscles are brought into play. It may look a lazy fish although it is on the move all the time, but when called upon can really move. I witnessed this with one odd blue-head that chased a blue damselfish around and around the tank. This is the only occasion I've seen any aggressiveness. He just didn't like that blue damselfish and I had to separate them in the end. What amazed me with this incident was that no matter where the unfortunate damselfish went, through tiny crevices, between sharp coral pieces, the blue-head whizzed unerringly after it, never giving up the chase as one would expect and never getting scratched. It seemed impossible, but these fish seemed to judge their distance past the sharp edges so finely that it would be difficult to observe how it is done at speed and without harm.

Sexing these fish and identifying them can be very confusing and many authors differ. Both the young and the males and the females can all look so different that many have been listed as a different species. To add to the confusion some females change sex to males and assume a totally different colour-pattern again.

My very next lot of Wrasse was to prove this point to me. The blue-head was easily picked out, having, as its name implies, a bright blue head and a green body, these two colours separated by two black bands which traverse the body. Between these two black bands the colour can be blue or white. With the fish's mood also the green body will change to yellow. This fish is listed as *Thalassoma bifasciatum*. With the blue-heads came fish similar in body-shape but not bearing these gaudy colours. Running through the body lengthwise is a thick black line; above this line the body is yellow in colour and below it white in colour. In others, slightly larger, the black line is broken in patches. These fish I recognised from photographs as fish called *Thalassoma lucasanum* and also as *Thalassoma nitidum*. I was due for a surprise watching these fish for they changed colour frequently. I had these swimming actively around the tank and perhaps they would disappear behind some coral and reappear looking like a different fish altogether. The thick black band had completely gone and in its place a beautiful all-yellow fish. Then, while you watch this black band returns and the effect is spoilt. I've seen fish lose their markings, of course; angels are noted for it, but this transformation is so complete, no trace of the black band at all showing, it is amazing.

At this time Derek Bevin and I had met and became

firm friends. I took some of these fish down to him and he was convinced that the blue-head and the *lucasanum* were, indeed, one and the same fish and most likely male and female. He was, as it turned out, quite correct. Information is still not complete but the fish with the black band broken are already mature and are both male and female. These have been seen to spawn in groups. The large blue-head and large specimens of the yellow fish are seen to pair off. No small blue-heads are ever found and it is now believed that the blue-head is really a fish that has undergone a sex change from female and this totally different colour form appears. This is known to happen with other species of Wrasse.

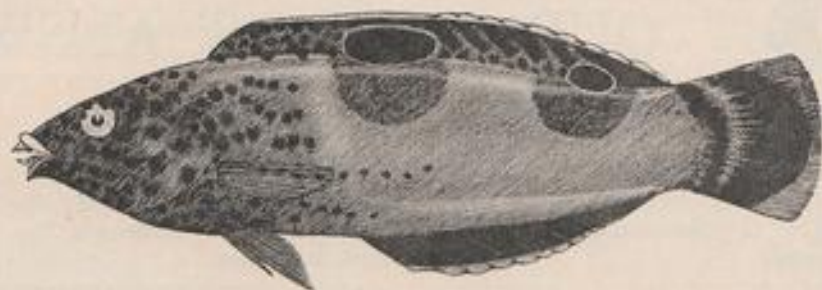
Another peculiarity of the blue-head is its ability to completely cover itself at night with a fine mucus leaving only an opening at the mouth and behind the anal fin for water to enter and leave and enable the fish

dried food. With pieces of shrimp or fish that are too large for them they take it to a piece of coral and hammer a piece off by banging their mouth with the large piece in it hard against the surface of the coral. They search around all day for food, turning over small pieces of coral looking apparently for any small animal that might hide underneath.

I hardly know which to say would be my favourite Wrasse. So many are really stunning, but perhaps the *Coris gaimard* or the *Coris formosa* might win the vote.

Here are two species mentioned (if they are separate species) about which, when young, a lot of confusion arises. The young look at first glance to be the same, but there are differences. The adults, though, differ from each other and from the young. (Could the two colour forms be male and female?)

The young fish are red with white bands bordered



Coris angulata

to breathe. This very delicate tube-like sheath is not tight on the body and has been described by Wolfgang Wickler as a fish that puts on a nightie before retiring. He puts forward a theory that this is used to protect the fish at night from predators, some of which hunt by scent like the moray eel. I think, in any case, that with the movements of the water in the sea the waving mucus would be perfect camouflage. In the morning the blue-head swims out of his self-made shelter and it looks just like a cobweb left behind, and soon disappears.

The young blue-head often acts as a cleaner fish, removing parasites from larger fish while they remain perfectly motionless. He isn't a true cleaner in the sense that it is his only source of food. The Wrasse nibble at the coral with their strong teeth and search out small crustaceans and worms. I found that they love fresh water-snails crushed between the fingers and dropped in the tank. All the lot get eaten, shell and all. They are not really fussy eaters accepting even

with black running across their back and down the sides. There are five of these markings. In *formosa* the first white stripe crosses the forehead and appears on both sides of the fish. In *gaimard* this white marking is lengthwise towards the mouth and is not seen side-on. In *formosa* the white stripe on the trunk behind the ventral fins reaches the belly, but in *gaimard* reaches only the middle. The black edging is broader in *formosa*, and the anal and ventral fins and belly black. *Formosa* looks dark red, *gaimard* pale red.

Both these fish stand out in any aquarium, but better is to come when they grow.

The adult *gaimard* has a yellow head with a blue line starting below the eye and travelling to the beginning of the dorsal fin. The body is light brown with dark spots. The dorsal fin red-edged, pectoral fins clear, ventral fins red and edged with blue; caudal fin starting red, becoming clear and edged with black. A lovely fish to see. The *formosa* adult hasn't the dark spots on the brown body but instead

is covered with small bright blue spots and looks even better.

When first introduced into a tank with a coral or sandy base, these fish go under the coral at night very early, around 6 to 6.30. Lights on or off make no difference and it can be frustrating if you want to show them off to visitors who always call in the evening. As they settle, however, they slowly begin to stay up late and now I have Wrasse still swimming up to 10 p.m. It is remarkable that they never show any marks from diving into the rough compost. Their eyes would seem to be almost certainly damaged for there are no eyelids, but nature must have found a protective measure for them for they come to no harm.

More beauties include the Banana Wrasse, the Leopard Wrasse, the Blue Wrasse and the Green Wrasse. Many more species are turning up at intervals.

Graham Cox's favourite Wrasse is the two-spot

Wrasse *Coris angulata*. I've not yet been able to get one, but I've seen one in his show tank in Croydon. It is white with a pale orange shading into it and dotted all over with small black spots. Two large spots on its back give the fish its name. Seeing the fish and describing it is totally different. You just have to see it to appreciate its beauty. This fish was not for sale, and it does appear to be scarce. Graham said when he visited our Club that they are not really scarce but just hard to catch for they dive out of sight quickly if approached. Perhaps laying a baited trap for them might be the answer. This beautiful fish has one drawback in that unless you possess a large aquarium it will outgrow it.

Well, perhaps I've raised some interest in the Wrasse species now. Next time you visit your dealer if he stocks marines, look out for the Wrasse; they are not expensive compared with other marines, they are easy to keep and lots of fun to watch.



OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex.

TROPICAL QUERIES

by Jack Hems

I have just introduced some small bucktoothed tetras into my community tank. I should be grateful for any information you can give me regarding them.

The bucktoothed tetra is known to science as *Exon paradoxus*. It lives in the natural state in northern South America. In its native freshwaters it is said to attain a length of about 6 in. Aquarium specimens, however, do not normally reach anything near this size. *E. paradoxus* is not a satisfactory fish for a community aquarium. As it increases in size and years it almost always develops into a fin-nipper and spiteful bully. It has a hearty appetite and flourishes best on the larger livefoods and meat.

Are Malayan halfbeaks difficult to keep? My newly purchased trio look most unhappy in their 18 in. by 10 in. by 10 in. tank and refuse the

freeze-dried foods and flake foods I have offered them.

Halfbeaks of the genus *Dermogenys* should be given brackish water and a temperature in the lower to middle seventies (°F). Food is taken at the surface or close to the surface. Thus newly-born guppies, surfacing gnat-larvae, and tiny worms, red or black, dispensed from a perforated worm-holder, are called for. I take it that the halfbeaks have the tank to themselves. They are not the sort of fish to place in a community tank.

Would it be in order to keep a young *Geophagus jurupari* in a 3 ft. aquarium already stocked with neon tetras, emperor tetras, harlequin fish, and pearl gouramis?

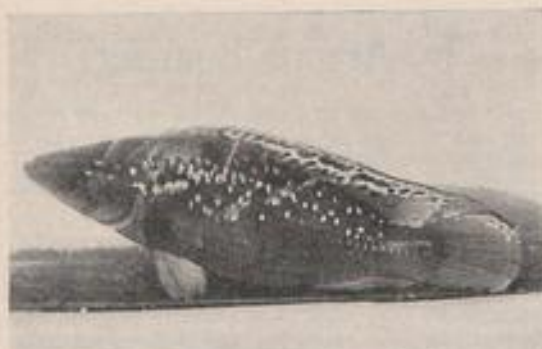
I have always found this delightful species better behaved than many other of the larger fishes recom-

mended for a community aquarium. But when it attains a fair size it does a bit of chasing, so thick clumps of plants should be grown in the rear half of the tank and at both ends. It is, however, unlikely to molest smaller species such as neons or harlequins. These seem to be beneath its dignity. To sum up then, put in plenty of plants and few large fish and all should be well.

I should like to keep a cichlid that would make a good conversation-piece in my lounge. The tank I have in mind would be about 4 ft. long and fit into an alcove. I favour a fish that is not faddy about its food, has good colour, and is neither too boisterous in its movements nor too shy.

The oscar (*Astronotus ocellatus*), the Jack Dempsey (*Cichlasoma biocellatum*), or the firemouth cichlid (*Cichlasoma meeki*) should fill the bill.

A friend has just given me a young cichlid called *Crenicichla saxatilis*, which has become too aggressive for his tank. Neither my friend nor myself know much about this fish and I would be glad to have some information about its maximum size, preferred food, breeding habits, and where it is found in the wild.



Crenicichla saxatilis

C. saxatilis is said to reach about 14 in. in the natural state, but only about 9 in. in captivity. Like our native perch or pike (in point of fact *C. saxatilis* and its congeners are popularly known as pike-cichlids) it is a predatory species and lives on smaller fishes, amphibians, and so forth, but in the aquarium it will accept large earthworms, grubs, and meat. The reliable books tell us that the fish spawns in depressions in the sand. Brood-care is the responsibility of the male. It is native to Trinidad and the South American mainland as far south as Brazil.

Would some small pumpkinseed sunfish (*Lepomis gibbosus*) live contentedly in my 4 ft. tropical

community tank? What sort of food do they require?

Although the pumpkinseed sunfish has a wide temperature range, it is not happy in tropical conditions all the year round. Further, it is too snappy to live with the popular tropicals. In general, it thrives best by itself or with others of its own kind in a well-planted tank maintained at comfortable room temperature. It can be a faddy feeder, but most specimens can be got on to earthworms or meat or live gnat-larvae or *Daphnia*. It is not uncommon for coarse dried food, or flake food, to be taken.

I want to have a shot at breeding the neon tetra. Please give me some information on this subject which might help me to achieve my aim.

You need soft and acid water, scrupulously clean conditions, and not too much light. After the swollen-sided female has been excited to the point of egg-laying, the pair will rush to fine-foliaged plants. There eggs are scattered. The procedure is repeated several times. When spawning is finished, the parent fish must be separated from the eggs. Hardly any light should enter the breeding tank until after the eggs hatch out, and then only a little light should be allowed to enter the tank daily. The fry should be swimming within the space of five or six days. This all sounds quite straightforward and easy, but the snag lies in the fact that though eggs are often laid by neon tetras, few seem to hatch out. That is, in this country. Abroad breeding this fish is not always so difficult because the water is often of the right sort to suit the fry. A temperature of from about 72°F (22°C) to 75°F (24°C) is about right for spawning neons and raising their fry.

I would like a tank of mixed cichlids. Any suggestions as to suitable species for a 5 ft. tank would be welcomed.

I suggest the firemouth cichlid (*Cichlasoma meeki*), the severum (*Cichlasoma severum*), the demon fish (*Geophagus jurupari*), the keyhole fish (*Aequidens maronii*), the golden cichlid (*Aequidens awani*) and *Aequidens curviceps*.

Would a pair of Australian rainbow fish (*Melanotaenia nigrans*) settle down in a roomy and artificially aerated community tank?

Providing the water is neither too soft nor too acid, that is for an atherinid, the short answer to this question is yes. *M. nigrans* (shown on next page) appreciates a little salt in its tank water, a bright spotlight and a temperature in the middle sixties to middle seventies (°F).

What is a red horse minnow?

The red horse minnow, better known to ordinary folk in the U.S. as the red shiner, is a 3 in. cyprinid widespread over the eastern half of North America, from Illinois to Texas.



Australian Rainbow Fish

I have seen some barred Siamese catfish in a dealer's shop. Is this species easy to keep?

There is nothing difficult about keeping this fish, known to science as *Leiocassis siamensis*, apart from the fact that it needs a spacious tank to swim in and plenty

of earthworms, grubs, tubifex, and the like, included in its diet. A well-grown *L. siamensis* should be kept apart from small tropicals, for it is a nocturnal feeder and when it goes on the prowl at night it can quite easily gulp down a resting guppy or stationary neon tetra.

What do I need in the way of apparatus to change my 24 in. by 12 in. by 12 in. freshwater tropical aquarium over to marines?

I suggest you hurry out to the best-stocked bookshop in town (or write to one of our bookselling advertisers) for a copy of *Tropical Marine Aquaria* by this country's master marine aquarist, Graham Cox. For there is more to marine aquarium keeping than just buying a few pieces of equipment and sticking them in any old tank. It is of supreme importance to have a tank specially made for seawater; no saltwater must come into contact with a metal frame. A special type of filtration must be installed. The artificial seawater must be of the correct salinity and density, and so on and so forth. I repeat obtain a copy of *Tropical Marine Aquaria* as the best introduction to the subject and go on from there.

GOLDWATER QUERIES

I have kept goldfish for three years and would now like to keep and breed fancy goldfish, especially veiltails. Can I breed them in a tank 24 in. x 12 in. x 12 in.?

It is possible to breed any variety of goldfish in a tank the size of yours. However, it is not easy by any means. You will only require two or three fish, say, one female and two males. One male would be enough except that sometimes the attentions of two males will encourage the female to lay her eggs better. The difficulty comes when the fish have spawned. Most fishes are very fond of eggs and will eat any they can find once the excitement of spawning is over. Even if you are fortunate enough to get some eggs the fry could be eaten if any hatch. The best method to adopt is to have a spare tank in which the parent fish can be placed once plenty of eggs are seen. The tank for spawning should be clean and well planted with water plants, especially those with fine leaves, such as Hornwort. It is better to remove the spawners than to try to remove the eggs as they will be sticking on the water plants and would be difficult to take out of the tank.

Although plenty of water plants should be in the spawning tank, it is possible to over-do this as it must be realised that at night the plants will not give off oxygen but carbon dioxide. I have known

by Arthur Boarder

a pair of fish to die in a tank during the night where they had been placed to spawn in a heavily planted tank, purely through lack of oxygen. An aerator could be installed to operate during the hours of darkness.

This year I have bred five spawnings of shubunkins but out of the lot of youngsters I have only 10 fry which are likely to be good fish. Where can I get some better fish for parents?

It must not be thought that a large proportion of fancy goldfish will be bred every time the fish spawn. If you get a few show specimens from a spawning you will be well satisfied. No fancy goldfish varieties are likely to produce all good types of youngsters. Sometimes a certain pair will throw plenty of good fish and another time the same pair might only produce a very few fish worth growing on. Some strains can be better than others but it is being very optimistic to expect a large proportion of show specimens from the majority of spawnings. I will include the address of someone who can supply you with some good shubunkins, but I am not going to predict that all their youngsters will be perfect specimens.

On three separate occasions I have bought golden tench, golden rudd and golden tench.

Please tell me the difference?

Surely your supplier explained to you the difference between the fishes you bought? If not you can tell the tench by the apparent lack of hard glossy scales. The body looks as if all scales have been stripped off. The fins are rounded and the fish should be a shiny, golden-green colour. The orfe is a long, streamlined fish, rather shallow in the body and with a pale gold colour. These fish sometimes show black spots or markings along the back. The rudd is a deeper-bodied fish with a darkish back but silvery beneath. The silver colour is diffused with red and the fins are also red. The orfe are not suitable for a tank when they grow over four inches long overall. They are better in a clear-water pond.

I have two fantails and two shubunkins in a tank indoors. Will they winter in a pond out of doors?

You have left the moving of these fishes too late in the season. It is quite possible for the fishes you mention to go through the winter in an outdoor pond quite safely, but it is necessary to gradually get them used to a lower temperature before subjecting them to the cold of a winter out of doors. You should have prepared your fishes before the end of September, so that their tank water was reduced to what they would have to withstand in the pond. You had better wait until the spring before putting them in the pond.

I have a couple of large ponds and would like to plant them with water lilies. Could you supply me with any addresses where I could write for catalogues of such plants?

I am sending you a few addresses but you can also find dealers advertising in the *Aquarist* every month. Such plants will not usually be sent out until the spring, as it is of little use trying to plant them in the winter. It would be possible to do so if the plants could be supplied in their growing containers and that they were not kept out of the water for more than a day, and even then must not be allowed to dry out. When you do order it will be a good plan to let the dealer know what size your pond is, especially the depth, and state which colours you prefer. He will then be able to supply you with the best types for your purpose.

After repeated failure to winter Koi out of doors, where goldfish, orfe, tench and rudd survive happily, I am considering making a pond inside my greenhouse. I can make a pond, 10 ft. x 10ft. x 2 ft.; one 20 ft. x 4 ft. x 2 ft., or two pools 10 ft. x 4 ft. x 2 ft. Which do you recommend?

In the first place you should have been able to keep the Koi in your pool with the other fishes and I can only think that the fish were not properly acclimatised before they were put outside. They may have been recently imported and had been reared under warm conditions. I will give you the name of a supplier who has bred some of these Koi out of doors in this country and they should be more hardy. As for your pools, I suggest that you make one pond 20 ft. long and 4 ft. wide. This will be much easier to control than one 10 feet wide, as it is not easy to reach every part of it. Also you might include a slide so that you can divide the pool into two in case you need a separation during breeding purposes.

I have a tank 36 in. x 12 in. x 15 in., and wish to stock it with plants and fishes, goldfish, shubunkins, etc. What kind of filter and aerator shall I use and would an under-gravel filter be the best type to use? Also which snails do you recommend?

Your tank will hold 18 inches of body length of fish and as long as you do not try to keep more than this amount the tank will function without artificial aeration or a filter. It is only when one tries to over-stock a tank that these additions are really necessary. I have kept goldfish varieties in an indoor tank for many years without having to use either. The under-gravel filters could remove much of the nourishment necessary for the well-being of the water plants. One of the reasons why plants are used in a tank is to use up the waste matter from the fishes and such matter gives them food so that they can thrive. As for water snails, contrary to popular belief, they never yet have kept a tank clean. They emit as many droppings or more than goldfish and can eat much of the food given for the fishes. As soon as food is placed on top of the water the snails arrive and with a sucking motion they draw much of the floating food into their mouths and what they cannot eat they often spoil with slime. Most snails will eat your best water plants and certainly any fish eggs which may arrive. So my advice is to omit the snails.

Your recent advice on clearing the water of my pond was much appreciated but I would like to inform you that all of a sudden the water became crystal clear and I can see the bottom of the pond and also the fish. Why did this happen?

The pond water was doubtless filled with green *Algae*. Once the sun lost its power and the water became colder, the *Algae* died down. Most ponds which were very green during the warmer months of the year would have reacted in the same manner.

Once the warm weather arrives next year you must expect some more *Algae* to grow, but plenty of growing water plants will help to check the increase of the *Algae*.

I cannot keep the walls of my tank clear of green *Algae*. I have plastic tanks and use the scraper supplied by the makers, but this has scratched and ruined one tank. What can I use?

Only clean the front of the tank and let the rest become covered with *Algae*. This will prevent seeing through the tank and give a more pleasing appearance. Try using a piece of Nylon such as "J" cloth on a thin, flat stick for cleaning the front of the tank.

I intend to make an outside pool about 7 ft. x 5 ft., next spring. How deep should it be so that the fish will be safe in the winter?

A depth of two feet will be ample for your pool, anything less could be dangerous in a severe frost.

Do you think it would be a good idea to make a polythene-covered frame to fit over the pond to prevent it from freezing over in the winter?

This might keep out a few degrees of frost but I do not think that it would prevent the water from freezing over if the weather became very severe. A small heater switched on when it was very cold

would be a better method to adopt.

I am enclosing a sample of the sealer used to glaze a tank 36 in. x 12 in. x 15 in., which I have recently bought. Do you think that this material could be dangerous to fishes?

I do not like the smell of the putty-like green substance used for glazing your tank and would not feel confident to put fishes into it in such a state. I would get some Silicone sealer and go over all the joints, completely covering any of the existing material. This would make the tank quite safe.

I am a newcomer to the hobby and would like to know the difference between, "Koi," "Higoi" and "Nikishi Koi"?

Koi means Carp, and the Nikishi is just a fancy name given by the Japanese. Higoi are a different kind of fish, growing to a large size and suitable mainly for a largish pond.

For a few years my goldfish in the garden-pond bred, but for the last three years they have failed to spawn at all. Why is this please?

Goldfish usually spawn until they are at least twelve years old and I have bred from fantails of seventeen years of age. Goldfish will not usually spawn unless the water in the pond is very clear and well oxygenated. Try cleaning out your pond in the spring and this should do the trick.

KEEP THE HEAT IN by S. M. H. Loquens

WITH the cold days of Winter casting leaf-like patterns of frost over one's windows, the cost of heating tropical aquaria can rise dramatically. How much it will rise of course, depends upon the situation of the aquaria. For the hobbyist with perhaps one or two aquaria in his living room, the cost will in all probability, hardly be felt. However, one must also consider the hobbyist with a larger number of aquaria, and these in all probability not housed in the living room where they would benefit from supplementary heating. An aquarist such as this can well be excused from raising his eyebrows over an increased electricity bill. But how can one save on one's heating bill? The answer is, of course, to insulate aquaria against cold draughts and the heat losses that ensue.

There are a number of materials that are suitable for the purpose, one of the cheapest and easiest to handle being expanded polystyrene. This can be obtained, as most people probably know, from do-it-yourself or hardware shops in the form of rolls, sheets or tiles. The latter come in convenient sizes at only

one or two pence each (a 24 x 12 x 12 aquarium will be found to require about six such tiles) and are generally thicker than the same material in rolls. The high insulative effect of polystyrene is caused by the presence of thousands of tiny air spaces (hence its lightness) which serve to trap escaping heat and thus reduce its loss.

To insulate the aquarium the polystyrene should be trimmed to size so that it will completely cover the back, base and ends. This can be done quite simply by using a razor or sharp knife; "fingers and thumbs" brigade, beware! I favour sticking the trimmed portions to the frame around the mentioned areas, thus leaving a slight gap between the glass and the polystyrene. By so doing one gains an extra insulating layer, namely, static air between the two surfaces, which adds to the overall insulating effect. When sticking the polystyrene to the base of the aquarium, however, it may be necessary to actually stick it to the glass lest the frame be prevented from

Continued on page 350



R.S.V.P. Not Forthcoming

We are not a "Big Society" but the H.A.S. had its "Inter Club Show" on 4 October. Our society invited 12 other societies to join us at our show, wire a message reading "Please inform the Sec. as to how many members will be attending our show so that catering arrangements can be made."

Right!! The night arrived; a good attendance from one Society and a showing of members from two other Societies. These three, had the right attitude and respect to the H.A.S. by letting our Secretary know they were coming and how many. But the other nine societies hadn't the decency to let us know if they were coming or not, so food was available for them, just in case they turned up, but they didn't come, so food and money were just wasted.

What has the H.A.S. done to deserve this kind of treatment from nine societies, or are we one of many Societies who receive this kind of treatment? It would be interesting to know.

Yours sincerely,
Mrs. Jo. Dickinson,
Social Secretary,
HORSFORTH AQUARIUM SOCIETY,
20 Long Row, Horsforth.
Nr. Leeds, LS18 5AA

B.M.A.A. Goes from Strength to Strength

The Sea-Horse emblem of the BRITISH MARINE AQUARISTS' ASSOCIATION is now becoming familiar to aquarists all over Britain, appearing on posters and signs and especially on the unusual and striking badges worn by our far flung members.

As the B.M.A.A. enters its second year, it seems remarkable that it has made such progress in only 12 months.

From a shaky start, the association grew and flourished, now headed by Mr. Graham Cox, our Honorary President.

Newsletters are produced once monthly and usually contain many articles on a very wide range of subjects, from rare Trigger Fishes to the common British Hermit Crabs.

With a show standards committee and, for the first time, perhaps, a really credible pointing system, the B.M.A.A. can supply experienced marine judges at shows.

January, 1972



In addition to the central body, the B.M.A.A. has established two well attended local groups with more in the process of formation. In fact, B.M.A.A. members have travelled to all other parts of the country to meet other members. And membership is not exclusive to Great Britain. In Malta and in the U.S.A. we have members, and indeed, there is considerable interest in our association in several areas abroad.

Interested aquarists should write to Mr. Denis Horton, 125 Lowlands Avenue, Streetly, Sutton Coldfield, Warwickshire, U.K.

Finally, I would like to offer my great thanks to all of the B.M.A.A. committee and to members, for their enthusiasm and hard work in 1971.

Yours sincerely,
HUW COLLINGBOURNE,
p.p. THE BRITISH MARINE
AQUARISTS ASSOCIATION.

Answer to Find the Rare Plants

BORNEO FERNS

WHAT'S YOUR OPINION?

It is regretted that this feature does not appear in this issue but it will be resumed in the February issue.

A TREATMENT FOR MARINE COPEPODS

by J. K. Wellby

HAVING BEEN plagued for some time with an unknown disease in my marine tanks, I recently discovered they were infested with marine copepods. These pests seemed only to affect some species in the tank, especially the *Cheatodons*, having lost one or two as a result. The symptoms of this parasite is the dying off and growth inhibition of *algae* (copepods live on *algae*) and when affected, the fish "scratch" themselves on the rocks and coral continuously, there being, however, no visual signs of their presence on the fish. The gill rate did not seem to increase unduly. (NOTE: the conventional *protozoan* treatments are, of course, completely ineffective against copepods).

One can also identify these creatures with the naked eye if the tank is observed closely with the filtration and aeration off; the copepods can be seen running up and down the glass and over the gravel, like small insects about one-thirty-second of an inch long.

On consulting a well-known dealer his advice was to remove the fish to another tank, heat the infested tank to 150°F as quickly as possible and allow it to cool naturally back to its original temperature. This treatment was carried out and was successful in killing the copepods. The disadvantages of this method it appears are twofold: a) the essential nitrifying bacteria in the gravel may be reduced or destroyed (this assumes high power undergravel filtration which by now should be accepted as essential for novices). In fact, I registered a nitrite reading shortly after this treatment.

b) When the fish are returned to the tank they could re-infest the aquarium. Here again the advice from the dealer was to give each fish a freshwater bath containing a substance called "Neguvon" to kill any copepods on the fish. This treatment I have used in the past but with only limited success—it gives the fish a pretty hard knock!

Having treated this first tank thus, but not having returned the fish, I discovered to my horror that the tank into which I had transferred the fish was also considerably infested with copepods. This previous treatment being somewhat inconvenient and having the disadvantages listed, I decided to put an experiment to the test and treated the whole tank, fish and all. The treatment was as follows: I had obtained some of the compound "Neguvon" mentioned previously—obtainable only through a vet, the drug is distributed in the U.K. by Baywood Chemicals Ltd. I made a five per cent solution in water of this and I calculated that from the dropping bottle I was using,

one drop per gallon of aquarium water was equivalent to a concentration of one part per million (1 ppm) "Neguvon". The aquarium contained the following fish: one coral beauty (pigmy angel) one *percula* clown, one tomato clown, one yellow tail blue damsel, one banana wrasse, one *Cheatodon collare*, and one *Cheatodon lunula*. The treatment was as follows: At half-hourly intervals the concentration in the aquarium was increased from 0.05 ppm up to a maximum of 2.5 ppm "Neguvon". At the two ppm level all the copepods appeared to be dead, and the fish showed no signs whatever of distress. The tank was then left overnight (approx. eight hours) and in the morning all the fish except the tomato clown, seemed healthy, and this exception was showing typical symptoms of poisoning from this type of compound. A large external box filter containing highly active "SeAcoal" carbon was immediately attached to the aquarium, as active carbon will quickly remove this type of compound from water. After three hours the tomato clown was showing no signs of distress and that evening was feeding as were the other inmates. It appears that 2.5 ppm was about the tolerance level for these fish and another tank with the same problem was treated at the one ppm level with the same success but in this case the fish showed no signs of distress at all.

My advice for anyone identifying this parasite would be to obtain from a vet a five per cent solution in water of "Neguvon" and treat the tank at the one ppm level (be sure not to overdose) having a carbon filter at the ready to be used at the first signs of any distress (uncontrolled muscle movement and general lethargy). The advantages of this treatment are that no nitrite was registered in the two tanks treated in this way, the fish suffered little or no distress (except the tomato clown at the higher concentration level) and the treatment is simple and effective. NOTE: ensure no human contact with "Neguvon"; wear rubber gloves when handling.

In conclusion I would like to say that although at the one ppm level my particular fish seemed unaffected by the treatment, this does not necessarily hold true for all species—so have the carbon filter ready: it certainly did kill the copepods though!

Finally I would like to take this opportunity to thank Mr. Graham Cox, Trevor Wilde and the Croydon manager of SeAquariums Ltd. for their ever willing assistance and expert advice on some of my past problems as it was indirectly a result of this advice which prompted the successful experiment above.

BREEDING

Hemidactylus turcicus

by H. G. B. Gilpin

I HAVE MAINTAINED a collection of these charming little animals for a considerable number of years. Apart from one characteristic, the facility with which they abscond from even carefully designed, escape-proof quarters, they make excellent vivarium inmates.

Most years mating has been observed taking place in the colony and subsequently eggs have been seen in the pinkish, partially transparent abdomens of females, clinging to the front of the vivarium with their undersides tightly pressed against the glass. Sometimes too, eggs have been deposited in the vivarium, either on the rounded gravel covering the floor or attached to one of the vertical glass sides, but until this year none of the eggs actually hatched.

This year, however, largely as a result of an accident, a successful breeding took place. The accident consisted of the undetected escape of a female *turcicus* from the main gecko vivarium. This had been established for some years and was inhabited by a dozen specimens, both *Tarentula mauritanica* and *Hemidactylus turcicus* obtained in the first place from Spain and Malta.

The female's defection was not discovered until she was seen scuttling along a bench with the characteristic laterally weaving motion of her species when moving over a slightly slippery surface. Catching an escaped gecko is never a particularly easy business, especially if it has been at liberty long enough to become familiar with its surroundings and discover some narrow gap where it can take refuge. My specimen was obviously well acquainted with the terrain and disappeared with celerity as soon as it was pursued. Fortunately it was observed insinuating itself through a small ventilation hole in the wooden frame supporting a tank devoted to red-eared terrapins.

The frame contained an electrical heating unit which maintained the temperature of the tank at 70°F. and consequently the enclosed area beneath the tank was permanently warm. The front of the frame was gently dismantled and the gecko recaptured, happily without the loss of its tail. Further examination of the space under the tank revealed the presence of two white delicately shelled eggs.

These were gently removed and placed in a small jar of slightly dampened sand, the eggs themselves being about a quarter of an inch below the surface of

the sand. A piece of polythene was fastened over the mouth of the jar, in the form of a dome, so that at its highest point it reached an inch and a half above the level of its contents. This was designed to conserve the moisture and at the same time to allow a reasonable air space above the sand.

The jar was then placed in a twenty-four inch by eight inch by eight inch vivarium, to one side and three inches away from the 25 watt bulb which heated it.

The eggs were first discovered on 27 July and on 20 August one of them hatched. A slit was made in the polythene and the baby gecko emerged into the vivarium. At this stage it was one and a half inches long, basically an almost translucent greyish cream colour spotted, rather more heavily than the adult, with dark brown. The tail of the adult is much swollen where it joins the body and narrows sharply to a fine point. It is pinkish cream, sparsely marked with fine brown spots. That of the baby, on the other hand, is slender, gently tapering throughout and fairly heavily barred with dark brown rings. It is longer in proportion than that of the adult and accounts for half of the entire length of the little lizard, whereas the adult's tail measures about half combined head and body length.

One of the main problems encountered when rearing newly born lizards is the provision of a regular supply, in sufficient quantity, of insects small enough for the tiny animals to swallow. In this case no difficulty was experienced as the relatively large mouth of the baby gecko enabled it to feed on freshly hatched stick insects. My colony of these has been in existence for many years and at any given time can be relied upon to provide all sizes from the egg to maturity and with only one baby to cater for the supply of new born specimens was adequate.

Usually I have found that it takes lizards some little while before they recognise stick insects as food—probably because these insects remain motionless for long periods. This did not apply to the baby gecko. It ate them immediately and continues to do so.

The tank to which the gecko had been transferred previously contained lizards but for some considerable time had stood vacant. During this period mealworm

Continued on page 346

Haplochromis burtoni

by Pamela Hansen

Illustrated by J. Hems



EVERY AQUARIST must be familiar with the feeling one sometimes gets, when one sees in the aquarist dealer's shop a certain pair of beautiful fish and one knows that one must have them, regardless of the cost and regardless of one's available tank space. This was the feeling we had when we saw *Haplochromis burtoni* for the first time. In fact, we thought they were desert mouthbrooders (*Haplochromis desfontainesi*); the dealer did not know what they were. Already in the shop the male displayed all its colours, while the female had a swollen appearance which indicated, we hoped, that she was full of eggs. This was a further decisive factor which helped to induce us to make the purchase. The male measured about 6 cm., the female about 5 cm.

We introduced them into a tank measuring 90 x 25 x 30 cm. and containing 67 litres, in which there already were 14 young *Haplochromis multicolor* and 10 young *Limia melanogaster*. The tank was planted with *Vallisneria spiralis* and *Sagittaria*, and the bottom was covered with gravel; a structure of terraces, 5 cm. high, was built up from pieces of slate, which were overgrown with green algae. The lighting was from a 20-watt Gro-lux tube, the water was of a pH7, the DH 14 and the temperature 25°C.

According to *Tropical Fish Hobbyist's* loose-leaf page account of the desert mouthbrooder, its young should be released from the mouth 16-20 days after the spawning. So when our fish duly spawned, we decided to move all the fish other than the female mouthbrooder out of the tank on the 15th day. You can therefore imagine our disappointment when, after only 14 days, the young were apparently released and consumed; we therefore consulted all available literature to ascertain whether our initial identification was correct or not. Ironically enough this may have been a false indication that our fish were other than we thought, as in the pair's most recent spawning the young left the mother's mouth after 16 days.

We learnt that there are at least 70 species of

Haplochromis alone in Lake Victoria; but most aquarist authorities mention only three or four, not always the same ones. We came across three fairly modern aquarist works which mentioned only *multicolor*, the Egyptian mouthbrooder. In one colour photo of *desfontainesi* from *TFH's* loose-leaf pages, 11 egg spots could be counted on the anal fin, whereas our specimen had only six. Moreover, the fish was deep blue in colour, whereas the body of our male was of a more diffused blue colour, and rather reddish in the top half. Both specimens, however, had the same red patch behind the gill plate. In another photo, taken from afar, in the same article, the fish looked quite similar to ours in colouring, but one couldn't see the egg spots. In these loose-leaf pages it doesn't mention if the number of egg spots, or ocelli, is variable within the species. Sterba, on the other hand, in *Freshwater Fishes of the World* (1967) states that the desert mouthbrooder has 4-8 orange ocelli (note that this contradicts the evidence of the photo in *TFH*).

Apart from *multicolor* the *TFH* loose-leaf pages in our possession mentioned only two other of the *Haplochromis* genus which ours was definitely not, *callipterus*, which is a golden colour, and *philander* which has quite a different pattern on the anal fin from ours. *H. moffati* listed in Axelrod and Vorderwinkler's *Encyclopedia of Tropical Fishes* (1962) was also out of the question as it is olive in colour.

Assuming in the first place that our fish was one listed at all, there remained two possibilities: *wingati* and *burtoni*. In Wolfgang Wicker's *Das Züchten von Aquarienfischen* (1963) appeared a black and white photo of *wingati* with five or possibly six egg spots, but differently positioned from those in our fish. There was also a black and white photo of *burtoni* from behind, and this was more similar to ours but had at least seven egg spots. A colour photo of *burtoni* in Axelrod and Vorderwinkler's work again showed the fish to be similar to ours; the egg spots were alike although there

were five instead of six, and the dorsal and caudal fins had the same bright red spots over a blue background; two black bars across the snout were also present in both specimens. The only feature which made us doubtful was the presence of large light patches on the body of the *burtoni* in the photo, whereas our fish had instead three faint dark bars. The distinction between *burtoni* and *wingati*, which identified ours as *burtoni*, we got from the Danish translation of Arend van den Nieuwenhuizen's *Zwergbuntbarsche* (1964) in which he quotes Wickler as stating that in *wingati* the first egg spot sits just before or after the eighth ray on the anal fin, whereas in *burtoni* it sits on the fifth ray. Spots sit between two rays in *wingati* and on rays in *burtoni*.

We failed to find mention of the time taken for the *burtoni* young to become free swimming, which was the point at which our inquiries were prompted to begin. We were unable to consult *TFH* loose-leaf pages on *burtoni*. A word about the female, whose photo we have not yet come across in our research. She is very drab compared to the male, a plain yellowish-brown with one black spot, encircled with red and blue, behind the gill plate. She has four barely visible egg spots, the first sitting, as Wickler states, on the fifth ray.

So much for identification. Our fish were already ready to spawn when we acquired them but in any case we fed them well with *Cyclops* and *Daphnia magna*. We observed them closely every morning and on the third morning we saw that the female's mouth was full of yellowish-orange eggs, not such a strong colour as in the ocelli of the male, and she seemed correspondingly slimmer. The eggs were rather large in size, about 2 mm. The female hid herself where the plants were thickest; whenever she did show herself she was chased back by the male. She seemed to eat nothing, which is the common but not exclusive procedure among mouthbrooder females with eggs in the mouth. She occasionally made chewing movements as if to turn the eggs around in her mouth. On the seventh day one could see the eyes of the young through the transparent skin of the mother's underlip. No harm came to her by the male's presence in the tank. Later, whenever the female emerged from her hide-out, undoubtedly wanting her to spawn again, he would swim about 10 cm. in front of her, with all his colours intensified, shake his rear and thereafter turn sideways towards her, with all his fins distended, and displaying clearly his egg spots, now bright orange.

Fourteen days after the spawning, the female's mouth appeared to be empty, but she still didn't eat, and acted aggressively towards the male. On the following day her mouth was definitely empty, she was eating *Daphnia* and there was no trace of the young. We have no evidence that they were actually released from the mouth at this time, but it seemed unlikely

that the mother should suddenly swallow them at such a late stage; we may have been mistaken in this conclusion.

Since we acquired the *burtoni* more fish had been added to their tank, but some were now removed as they were ready for sale and we wanted only breeding stock in that tank. Left along with the *burtoni* were three female and two male adult *multicolor*, two female and one male *Linia melanogaster*, one red platy pair, and one black *M. sphenops* pair. We thinned out the plants, and the next day the male was again to be seen pursuing his mate. We fed them with *Daphnia*, and small earthworms from 2-5 cm. in size. It was important for the female to eat well to encourage her to spawn again, and to enable her to last through the long fasting period. The male established his territory in one end of the tank, and dug a pit in the gravel at the cost of a few *Vallisneria*. He occupied himself by chasing away the *multicolor*, especially the males, who were just tolerated if they remained at the other end of the tank. Meanwhile the *burtoni* female began to show an increasing girth; 26 days after the previous spawning and 12 days after the last lot of young disappeared, the pair spawned again. The temperature was now 26°C, a degree higher than before.

My husband was lucky enough to observe this spawning, which occurred in the forenoon. The fish did not use the two hollows the male had now dug, but instead, after removing bits of gravel and dirt, spawned on a piece of slate overgrown with algae, and resembling a billiard table. This slate lay in that end of the tank which was not generally regarded by the male as his territory. The female released the eggs onto the slate and then took them quickly into her mouth, while the male watched. This happened several times without there being a sign of the eggs being fertilised. Eventually the male laid himself almost sideways down on the slate, spreading out his anal fin, the egg spots becoming almost luminous. He remained in this position until the female put her mouth down by the anal fin, at which time the eggs were presumably fertilised. This occurred several times without there being any more eggs released in between. As she would not spawn further she was brutally chased away. The whole process had taken from 1-2 hours.

In the evening we moved the female to a 25-litre tank composed of three-quarters old water and a quarter fresh tap water, and planted with Hornwort and *Elodea callitrichoides*. The male thereupon lost all his black colouring on the ventral fins, snout, and body, and began to behave much more peaceably. After four days the eggs began to hatch. A few *Daphnia* were put into the tank, and on the following day there was excrement hanging from the female's vent, indicating that she had eaten either *Daphnia* or some of her young. We were away on holiday for the next nine days and so unfortunately could not observe the

further course of events, but when we returned it was to see a tank full of from 60-100 fry swimming freely around. They were already past the stage where they should rush to the mother's mouth at signs of potential danger. We moved the female back to the male, and began to feed the fry with micro-worms, and thereafter on *Cyclops*.

Now the fry are nearly five weeks old (counted from the date on which they became free swimming), and are from 1½ to 2 cm. in length. The black bars on the body are already visible, and also a bluish-violet shine. The fry, 84 in number, survived our moving house and now have a large (70×40×35 cm.) tank to themselves.

Thirty days after the previous spawning I observed the pair at it again. They swam around in a circle over the flat slate, each in turn lying again almost sideways over the slate, while the other bit at the anal fin. As the male made his turn he spectacularly swished up a

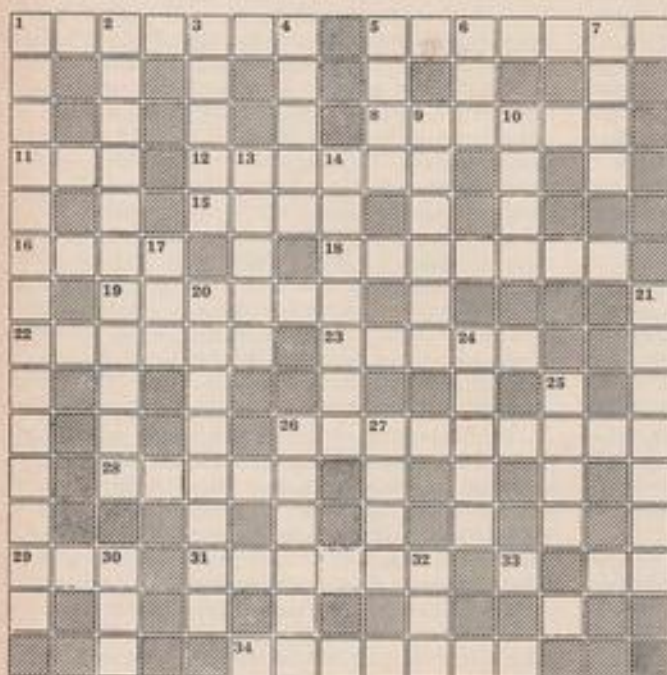
lot of dirt and gravel from the bottom. His colours were really beautiful. When he put his mouth to the female's anal fin the eggs were released 8-10 at a time. She turned round immediately, picked them up and in turn bit at the male's fin, and the eggs were then fertilised. Every now and then the play was interrupted while the male chased away approaching fish.

This spawning thus differed from the previous one in that each lot of eggs was immediately fertilised, whereas before the whole lot were fertilised at the end of the spawning. The fry became free swimming after 16 days and are at least 30 in number and perhaps much more.

A final note. Yesterday we observed that the *burtoni* male had developed the beginnings of a further egg spot at the end of the anal fin, bringing the total up to seven egg spots. This helps to explain the divergence in number of egg spots in various photos of members of the same species.

The AQUARIST Crossword

Compiled by M. W. CLARKE



Solution on page 342.

CLUES ACROSS

- Spectator at the undersea soccer match? (7).
- Terrestrial plant but undersea animal (7).
- Not always the little darlings their name suggests (6).
- To move quickly on foot (3).
- Perhaps the best place to keep *Brachyobolus australis*? (6).
- It will have a taste (4).
- Direction for the morning sun (4).
- Mini-waves? (7).
- Red fruit of the potato family (6).
- Some aquarium plants may do so if you have the knack (6).
- Nerve control centre (5).
- Barbus . . . , the golden barb (9).
- Smell is one (5).
- That receding tide (3).
- All good wholesalers do so (6).
- Tetry (4).
- Villain of the piece at the beginning of Genesis (7).

CLUES DOWN

- Botanically *Marsilea quadrifolia*, the answer to a child's dream (4, 4, 6).
- Genus of small pencil fishes (11).
- Large sea (5).
- Remit in return for your achievement (3).
- Scarcely jelly used in bacteriology (4).
- Preceded the children or did it? (3).
- The place to find little anabantids (4).
- A lady-like name for the villainous dragon fly larva (6).
- The forces of darkness traditionally (4).
- Tropics certainly will not be found in these regions (5).
- Air breathing organism (7).
- The canal path (3).
- Vegetarian piranha? (8).
- Pond food slightly larger than infusoria (7).
- However early you may be you'll be unlikely to find your fish so (2, 3).
- Watch this spot it is pregnant (6).
- Tetra similar to *Hyphessobrycon callipterus* minor but is a black and red over the body (6).
- All mammals have it (4).
- It can be an insect or just an indiscrutable bacterium (3).
- When driving with the boys you always start here (3).



From top: Sea Lamprey — Lampern — Planers Lamprey — Pride

British Freshwater Fishes

by A. Boarder

THE LAMPERN

THE LAMPERN is a fish which has been a rather controversial creature over the years as it is considered by some authorities to be only a variation of the Lamprey. There are three different names to these fishes which may be genuine species or just varieties which have, over the years, developed in differing ways according to the localities or the types of water in which they live. The Sea Lamprey, *Petromyzon marinus*, is the largest one and can exceed 3 feet. It is almost Eel-shaped but with two dorsal fins instead of a continuous one like the Eel. Another difference is in the teeth and mouth. The Lamprey is supplied with a sucking disc with which it can attach itself to a fish or other object. The fish can suck nourishment from a fish and many can often be found attached to large fishes such as sharks. The colour of the fish is a mottled brown and silver with a tendency for the markings to disappear on the lower part of the body where it is

silvery-green. This fish comes into fresh water such as the mouth of rivers to spawn and the males appear first. A type of nest or redd is made in the stones or gravel and when the females arrive they lay their eggs to be fertilised by the males, several fish congregating for the purpose of spawning. Spawning takes place from February to June and after this the fish appear to be exhausted and drift down river to the sea where it is thought that most, if not all, soon die.

The strange thing about the development of this fish from the egg stage is that the fry are like *larvae* which are not much like fish at all. They are known as *Ammocoetes* and are blind and toothless. They live in the mud at the bottom for a year or two, according to their rate of development, dependent on the amount of food available. They migrate to the sea when they become true fish.

The Lampern, *Lampetra fluviatilis*, is smaller than

the above named and does not exceed 16 inches in length. There is a difference in the teeth structure which biologists consider sufficient to distinguish this fish from the Sea Lamprey. Another difference is in the form of the dorsal fin. In the Lampern there are two distinct fins and the rear one is continuous with the caudal fin. This fish also lives for the most part in the sea but comes up the rivers to spawn in April and May. Usually rapid-flowing streams or rivers are chosen, those with a pebbly bottom. Several couples join together in the preparing of the nest, which is a groove in the pebbles in which the eggs are laid and then fertilised by the males. The resultant fry or larvae are very worm-like in appearance and spend their early lives embedded in the bottom of the stream or river. In some cases the time taken to develop into a proper fish can take up to five years when the fish swim out to sea. It is then about seven inches long.

The Lampern lives on anything living on the bottom of the river and also on fish-spawn. It also attacks other fishes boring itself into the flesh and living as a

parasite. In such a position Lamperns can be carried long distances by their hosts but they are also strong swimmers, being able to swim up strong-flowing rivers and also able to attach themselves to a stone as an anchorage against fast-flowing rivers.

The other type, or species if preferred, is known as the Brook Lamprey, *Lampetra laneri*. This fish rarely exceeds 12 inches in length and does not visit the sea. It is a very thin fish, not much thicker than a lead pencil. The spawning procedure is similar to the others described and the spawning takes place in summer. The River Severn used to be a favourite river for the taking of Lamprey and in olden days certain cities or districts were compelled to provide the king with a dish of Lampreys. It is even reputed that King Henry I died of eating too many Lampreys.

As much of the life of these fishes is nocturnal, they do not recommend themselves as aquarium fishes but it is possible to keep the Brook Lamprey in a well aerated tank which has a thick layer of sand on the bottom.

BOOK REVIEW

The Ecology of Water Life by Alfred Leutscher, published by Franklin Watts at £1.25.

The author is well known to all naturalists (herpetologists in particular) and to conservationists for he is Chairman of the Wildlife Youth Service (World Wildlife Fund).

This book attempts to furnish a broad outline of what ecology means so far as living organisms in and around water are concerned. With a wealth of very well executed colour drawings by David Cook and David Pratt, I believe the attempt succeeds.

Divided into four sections, water ecology is defined for the seashore, the pond, the marsh and the river. Each section is then subdivided into chapters dealing with the plants, insects, mammals, birds, etc., except in the case of the seashore where the subdivisions are geographical as well as classifying the resident life-forms, i.e.; rock pools, shore zones, sand dunes, the drift-line, etc.

A decade or two ago the word ecology was unknown to those not involved professionally or otherwise with natural science. Nowadays the majority of people not only know and use the word but are beginning to realise the importance of interactions between the myriad life species populating the earth. Books such as the one under review will greatly assist the good work of pressing home the vital importance of ecology to the well-being of human life on this planet.

A body of water, whether it be a lake or contained within a jam-jar, is a relatively self-contained unit and ideally suitable for the newcomer to ecology to commence his studies.

Crossword Solution

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

OBITUARY

MANY of the older aquarists will be sorry to hear of the death of Frank Mead at Hayling Island on 4 October. Frank was well-known in the thirties as a breeder of super Mollies and was very active on the organised side of the hobby, being a founder member of the North London Aquarist and the National Aquarists Society.

Frank was 78 and leaves a wife and son and we offer our sympathies in their sad loss.

From a Naturalist's Notebook

by Eric Hardy

PARTHENOGENESIS, the sexless reproduction that enables the rapid increase of greenfly, sawflies, *Daphnia* and some other invertebrates make population-explosions, is not usually associated with lizards. At Colorado University, Maslin and Cuellar have produced conclusive evidence of this among three species of *Cnemidophorus* ground lizards, in the family *Teiidae*. The American rock-lizard, *Lacerta saxicola* has also raised young from unfertilized eggs laid in captivity.

That learning ability of the lower invertebrates is not without demonstration as has been shown by Ray of Ottawa's Carleton University. By subjecting tiger salamanders (*Ambystoma tigrinum*) to unwelcome stimuli, he showed that their avoidance-responses increased gradually until they were 90 per cent successful after two days' training. The intervals between trials did not affect their rate of learning. Aquarists who keep the larva of the giant salamander *Dicamptodon* will have observed that it eats caddis-fly larvae whole, then excretes the stick-and-sand-case and hard parts of the nymph. Tagged with tantalum-182, male salamanders like *Plethodon jordani* have been found to occupy home areas about three times the size of those used by females, homing rapidly after being displaced up to 60 metres, the males coming back sooner than females. Madison working at Wisconsin University suggests that this homing uses the sense of smell, because the salamanders climb up vegetation when displaced; but one requires more evidence than that.

Outbreaks of blindness in "rainbow" (steelhead) trout in Chelmsford's Lodge Reservoir necessitated controlling the carrier of the causative thread-worm parasite, the nematode *Diplostomum spathaceum*—which was the pondsnail *Limnaea peregrina*, already guilty of carrying sheep-liver fluke-worm. It was necessary to use a selective molluscicide called Frescon (*N-tritylmorpholine*). One phase of the parasite develops in this common pondsnail, the other in several gulls. A concentration of 0.05 ppm in laboratory tests had 100 per cent mortality effect upon the snails, but only 10 per cent in fish. A dilute suspension of 0.025 ppm was applied evenly from a boat and followed a fortnight later with another application of 0.1 ppm just off the bankwater. The first treatment killed most of the snails and only a few sticklebacks, but none of the rainbow trout, and after the repeat no

living snails were found. It was selective enough for other aquatic snails like *Hydrobia jenkinsii* to be unaffected.

This example of the efficient and useful part pesticides play in aquatic problems is one of the most interesting accounts in an important new technical book *Pesticides and Freshwater Fauna* by R. C. Muirhead-Thomson (Academic Press, 248 pages, £3.50). Of course the picture is not always so rosy, and this largely American work gives many harmful examples of misused chemicals. The author, from the entomological department of the London School of Hygiene and Tropical Medicine who has already written a learned work on the ecology of insect-vectors, here deals with the chemical control of undesirable fish with piscicides, and the impact of pesticides on water life, chiefly invertebrates. We have had nothing like the chemical control of the sea-lampreys in the American great lakes, but the chemical and physical factors involved should interest all who have anything down to the common or garden fish-pond to look after.

The book contains a useful six-page appendix of the chemical formulae of the main pesticide chemicals, and might well have added a list of the multitudinous trade names of their various formulations. Its 20-page Bibliography, a formidable illustration of the scientific activity into the subject, does not include an important 13-page technical paper on the *Effects of Malathion on Two Warmwater Fishes and Aquatic Invertebrates in Ponds* by H. D. Kennedy and D. F. Walsh, just sent to me by the U.S. Bureau of Fisheries and Wildlife. Nor does it give Malathion in its Index. The two fish are bluegills (*Lepomis*) and channel catfish (*Ictalurus*) common in midwest and southern U.S.A. Exposed to four applications, roughly a month apart, of 95 per cent malathion in one or two parts acetone to 15 parts of water-carrier, up to 44 per cent fish losses could not be correlated with treatment levels. Growth of fish and number of aquatic insects were not significantly different between treated and untreated ponds, no acute or chronic pathology developed and the bluegills spawned twice. The number of lower organisms from high-treated ponds was much lower than from low-treatment or untreated ponds. After the third application the midges, the commonest insect larvae, and mayfly larvae, showed marked reductions.

This work seems to merely confirm early work with DDT in the Mississippi delta, that several aquatic

lower vertebrates (frogs) and insects (mosquitoes) can become resistant to low concentrations of DDT and other pesticides, but suffer increasingly with rising strength and frequency of application.

Malathion is sprayed on fruit and vegetable insects in this country as an organophosphorus insecticide; but Muirhead-Thomson's book goes into much detail about DDT, which is not now available to the amateur grower and has been excluded from recent

editions of Ministry of Agriculture's Advisory Leaflets. Despite omission from the index, Malathion is mentioned briefly in the susceptibility of bluegills to pesticides, very briefly. But the Bibliography doesn't include H. O. Sanders' 1969 paper of 18 pages on the toxicity of pesticides to freshwater *Gambusia*, in which malathion was used; nor does the Index mention Coumaphos, the most toxic of all the insecticides Sanders tested.

ALL IN A CICHLID'S WARDROBE

by R. H. Birchall

IN COMMON with other animals, including man, cichlids are able to communicate their feelings by making certain expressions which correspond to such emotional actions as frowning, smiling, or raising one's fists. These expressions take two main forms: firstly there are the positions and actions of the body, for example curving as often seen in courting, or in anger the blatantly aggressive thrust. Secondly, just as man can blush to show embarrassment, or go white with fear, a fish can change its coloration with mood or for camouflage. It is this coloration, and changes of it, with which I intend to deal primarily.

Colour-changes exist to either make the fish more noticeable, as in courting, or less noticeable when the fish finds itself having to escape from an attacker: a device which specially enables it to waste many hours of an aquarist's well deserved weekend chasing it with a net. The colour-change shows itself by areas of body pigment becoming more, or less, dark so as to form a pattern corresponding to the mood. The coloration is primarily due to pigment-containing cells, known as chromatophores, which are present in the dermis. The pigment in the cells reflects some wavelengths of light and absorbs others—the ones that are reflected are the ones that are seen; those that are absorbed cannot be seen. This coloration is seen on top of the background coloration caused by the body fluids and tissues. The chromatophores are all small much branched sacs with thin walls containing in the case of the black bars, melanin. This reflects no light at all. When the fish is pale the melanin granules are all concentrated in a clump but by the granules being dispersed a larger area for light absorption is created and black bars appear. The speed at which this can occur would make a chameleon wish to hide itself. The pigment granules can be either

red, yellow, orange or black and shades are produced by a blending of these.

However, the colours are not all due to pigments as mirror cells, called irridocytes, are also present and these contain reflecting materials that mirror colours outside the fish—they are mostly to be found on the pale underside of the fish. Chromatophores are most abundant on the dark back region and on the sides. The stimuli which cause a fish to change colour are received through the eyes, but the physiological mechanism whereby the pigment is moved around the cell is still not understood although it is believed to be a combination of nervous impulse and hormones—the rapid changes occurring by nervous impulses.

Pelmatochromis guentheri is normally a uniform greyish colour (Fig. a), the colour of its body fluids and tissues, and after breeding it rarely shows any coloration for the first few days of caring for its young. Patterns can therefore be seen more easily on this species and on *P. annectans*, than on some of those which are more highly coloured such as *P. kiribensis* and *P. taeniatus*. The dull coloration of the former two generally resembles the surrounding environment and so together with pattern "d" probably gives the fish an advantage in avoiding predators.

The pattern seen in the second illustration (Fig. b) is seen when one parent is driven away from its territory by its mate, but also occurs on about the fourth day after the young have become free-swimming when the parent begins to move around the tank. The stripes do not indicate a state of flight, but rather a tendency for movement. Many other cichlids show the horizontal stripes when they are swimming in schools so as to give the impression that the school is one fish rather than many individuals. These stripes also serve as a signal for gathering or keeping the group

together and assist the lateral line in orientation. All the illustrated fish, with the exception of the first which is uniform in colour, exhibit obliterative (or counter) shading which attempts to make the fish appear flat, like a shadow. The surfaces normally facing the light are countershaded by darkening, but where they would not normally be illuminated they are counterlighted; the sides of the fish have colours which are intermediate between the dark back and the light belly—an effect is therefore produced which would be opposite to normal lighting.



A light check pattern (Fig. c) is used both by parents and single fish after they have attacked another fish while possessing the horizontal stripes. The checking is not very strong and does not extend over the dorsal side; the forehead is also free of stripes. An accentuated form of this (Fig. d) is used for camouflage. This is camouflage by disruptive coloration and aims to break up the outline of the fish so as to avert or delay recognition. The patterns themselves are often so conspicuous that they concentrate the attention of the would-be attacker on the pattern itself. Such patterns may allow the bearer to pass for part of the general environment. This disruptive coloration is also used after the fish has just been subjected to a prolonged attack. The barring is extremely strong and extends over the forehead, thus incorporating the eye in the pattern, so that it ceases to

resemble an eye.

The spotted pattern (Fig. e) has several uses and generally seems to reflect indecision. The pattern is an intermediary both in meaning and in shading between the strong disruptive coloration (Fig. d) and the coloration of a fish in a state of preparedness (Fig. f). It appears:

1. When an attack is foiled (e.g. by a tank-separator, or the intended victim escaping through a small crevice beyond which the attacker cannot go).
2. Just before attacking an intruder who had



previously been "warned" for entering his territory.

3. When there is no obvious winner in a boundary fight and the fish retreats.

Lateral bars as seen in (Fig. f) also have many uses and tend to reflect a state of aggressiveness or preparedness.

They are observed:

1. When a parent is stationary.
2. When an intruder is approaching the territory.
3. Just before and after a chase.
4. When hesitating in its attack on a larger opponent.
5. If the lights are suddenly turned on at night and the parent is near its young.

As you will have gathered by now, *Pelmatochromis* is territorial by nature and mature males, as well as

some females, defend their domain by attacking all intruders. Smaller fish are chased away by bites, but if the opponent is too big and strong the owner will exhibit these lateral bars. When the darkest bars are seen and a chase follows the attack is much greater the stronger the coloration and very much more vigorous than if the parent only showed pale bars—coloration is therefore also a measure of intent. Other specimens, when presented with the same situation, may hesitate to bite and take up a lateral position towards the opponent spreading its median fins. These fins will then increase in coloration until they are black, thus effectively increasing the apparent size of the individual and may succeed in scaring off the intruder.

The above patterns are only types and the fish cannot be expected to exhibit one or the other just so as to conform to the text book. There is a large number of intermediary combinations of these patterns which undoubtedly have their own subtle variations in meaning, but the interpretation of these will require much further study. In *P. kribensis* the males, and some females, have a large number of black eye spots in their tailfin which are surrounded by an iridescent orange or green iris when the male performs his lateral "warning" display. If these spots serve the same function as in butterflies (not the fishy type) then they may have a frightening effect. There are too many spots for them to act as false eyes, as in marine butterfly fish, and under aquarium mating conditions

females do not seem to show preference for multi-spotted males. The spots are also seen in *P. taeniatus*, but they do not seem to be used for advertisement here either.

"Advertisement" is seen during courting and leads to a general enhancing of the colours—this breeding coloration is particularly striking in *P. kribensis* and *P. taeniatus*, and has led to their success as aquarium fish. Unfortunately, the areas of enhanced coloration fade as the parental period proceeds.

As a type of footnote or addendum, it would be interesting to know how many dotting fans and breeders of "Kribs" had observed the two colour forms of the courting male. The one has the red pigment extending from the anus to the snout; in the other the area from the anus to the snout is divided almost equally, with the forward area being yellow, and the latter red. These colours are passed on from parent to young and one type does not change into the other. I would like to thank Lottie Hardman for drawing the illustrations (a)-(f) and Ballière, Tindall & Cassell Ltd. for permission to reproduce them from the journal *Animal Behaviour* (XIII P. 322).

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PERMANENT PLANTS FOR SIMPLER AQUARIUM MAINTENANCE

LATEST development in the drive to make the maintenance of a tropical fish aquarium even simpler is the introduction of permanent plants.

An extended range of 27 different species is now being marketed by Inter-Pet of Dorking. Each plant is moulded in a non-toxic plastic and once immersed in the aquarium water is virtually indistinguishable from similar live plants.

Permanent plants also offer the aquarist advantages in eliminating pruning, they can be used in brackish water where the salt element would cause normal plants to die, and they cannot be eaten by fish.

Priced at around 18p, normally less than an aquarist would have to pay for the equivalent healthy plant from a dealer, they are fitted with a triangular tray to allow firm rooting in the aquarium gravel.

Inter-Pet's permanent plants are moulded to closely resemble the natural species and the varieties available include many popular, but far from hardy, exotics as well as a selection of more common plants, including Amazon Sword, Madagascar Lace, Foxtail, Honey-suckle and Squirrel Grass.

A leaflet is available direct from Inter-Pet, Church St., Dorking, Surrey illustrating the varieties available.

Hemidactylus turcicus

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beetles, survivors from former residents, had multiplied into a colony containing larvae from the newly hatched stage upwards. Once it was realised that the beetles were breeding, they were encouraged to continue doing so by regular feeding. The tiny grubs from this colony provide an excellent reserve of food for the young gecko. Day old locust hoppers are also offered from time to time but, as is not unusual at this season, reduced fertility has resulted in supplies of these insects falling below their normal level and specimens small enough for the gecko to swallow are not always available.

A pot of water is kept in the vivarium but so far the gecko has not been seen drinking, although presumably it does so. Unless disturbed it is inactive during the day and follows the adults' example of remaining static on the underside of some overhanging rock until hunger, or the decreasing evening light, stimulates it into motion. Unlike the adults, which are commonly seen clinging to the glass sides of the vivarium, however, the young one has not yet been observed holding on to, or moving over, a vertical surface.

Coldwater Fishkeeping

by A. Boarder

Oxygenating Plants

I AM GOING to describe a few of the good types of water plants as I am sure that many readers are very interested in which kinds they can grow either in pond or tank. I get so many letters asking for advice on the subject that a fairly full list of the better kinds will be acceptable to most pondkeepers and coldwater aquarists. If I appear to favour certain kinds then I hope to be excused as I can only write about those plants of which I have a personal experience. It is so easy to write on aquatic subjects today by referring to the numerous books on the market but I think that in some cases errors can be repeated by the various writers which have been regarded as the Gospel truth, whereas they may have been the opinion of a previous writer who had no personal experience with the particular plant. Although in some cases actual errors are not committed there are instances when important points about a plant are omitted. I remember one case in point; when I was reading a book on water plants which, when describing the Hornwort, made no mention of the fact that the species *Ceratophyllum demersum* never made any roots. This characteristic is, I consider, one of its most valuable assets.

As the above mentioned plant is such a useful one, I shall describe it first and, as a matter of fact, I would put it at the top of priorities for either the pondkeeper, the coldwater aquarist or the breeder. The common name is probably used because of the horn-like appearance of the growing ends of the shoots. This is so compact that it does resemble a short horn. The leaves of this plant are thin and needle-like and almost appear as bristles. They almost completely surround the rather brittle stem and are a dark green in colour. The stems branch frequently and the smallest cuttings can soon make quite a luxuriant mass given reasonable conditions. The fact that this plant never makes roots is one of the main features which appeal to me and to many breeders of coldwater fishes. A bunch of these



Water Crowfoot

shoots can be made as a spawning nest and lowered into the shallow part of a pond and the fishes will spawn on such plants very readily. As the fine leaves make such a good covering it is possible for many eggs to escape the attentions of the parent fishes and also should fry hatch out, they can find plenty of hiding places among the crowded leaves.

One of the best features of this plant in my opinion is that a bunch of the plants can be transferred to a hatching tank where there is no base compost. A clean bottom to such a tank is almost a necessity as it enables the breeder to clean out the base of the tank by siphon which would not be possible with soil or sand in the bottom. When planting in the pond, all that is necessary is to make a fair-sized bunch and tie with thin plastic string. A stone may be added to assist the bunch to sink to the bottom. Once there the shoots will soon grow and the ends of the shoots will soon

become embedded into the base matter in the pond. Although there are no roots, the plants appear to be able to obtain sufficient nourishment for growth through the stems or lower leaves.

As a plant for the coldwater tank, I know of none better. It will withstand plenty of cool water but it is not averse to warmer conditions and, in fact, makes much more rapid growth when the water is above 60°F. I remember setting up a tank at Olympia a few years ago and used a number of shoots of this plant as a decoration for a 24 in. tank. Two 40-watt lamps were overhead and within a day or two the plants had grown

species of this plant, also known as *Anacharis*, and all are really marsh plants but will thrive in water which is not as deep as that in which *Ceratophyllum* will grow. *Elodea canadensis* is the most common and one which can become a pest in waters where it cannot be controlled. The plants consist of brittle stems which can grow feet in length with whorls of small oval leaves surrounding them. The leaves are lightish green when young but darken with age. If introduced into a garden pond, this plant can become very dense and although it makes a good receptacle for fish-eggs, is not to be recommended where it cannot be strictly



Starwort

to the surface and made quite a dense growth. This kept the water crystal clear for the 10 days the show was open, much to the envy of other people with tanks as cloudy as soup.

There are a few other species of *Ceratophyllum* but they do not vary enough from the one described to be of particular interest to aquarists. They are: *C. echinatum*, thickly clothed with fine leaves; *C. muricatum*, with only a slight variation to the common species; *C. submersum*, has narrower leaves which are paler in colour; *C. submersum* var. *apiculatum*, closely resembling the first named and having slightly differing fruits which are very small and not often seen on all species.

Apart from my own preferences for the above plant, I suppose that the most popular Genus with most aquarists would be the *Elodeas*. There are 11

controlled. For a spawning corner of a large pond, it can be very useful and it would provide plenty of cover for the eggs and fry. A far better one in my opinion is *Elodea crispata*, now known as *Lagarosiphon major*, as this plant does not get massed up like the former plant and can grow to feet in length in good conditions. The brittle stems are thickly clothed with many leaves which curl back towards the stem and can present a complete whorl. Besides being a good plant for the garden pond it can be used with advantage in the indoor tank. For a corner cover this plant is hard to better, and it is also a good oxygenator. Small pieces of stem will soon grow especially if anchored by a stone on the bottom of the tank. Even pieces thrown on the water will soon send down roots to a good depth and take hold in the base compost. The other species in this Genus are not worth considering

here as they are rarely obtainable in this country.

Another fine plant for tank or pond is *Elodea densa*, now known as *Egeria densa*. This plant was renamed as the flowers are different from those of the true *Elodeas*. A fine plant for tank or pond and one which is more hardy than the previously named plant. The leaves on this plant are not as recurved as that plant and are somewhat longer. The leaves can be an inch in length and the stems can grow to several feet in favourable conditions. Easily grown from cuttings but it may be found that considerable damage can be done to it by hungry goldfish, which will eat the leaves and leave empty stems.



Creeping Jenny

If one requires oxygenating plants for the garden pond it is possible to use any or all of the above-named without bothering about any other kinds. One must realise that these plants, given good growing conditions, can soon take over a large part of the pond or tank. I see no useful purpose in trying to stock the average garden pond with too many kinds of water plants, especially underwater oxygenating ones. It will be found that some plants do not like the close company of certain others and so to try to grow too many species or Genera in a medium-sized pond is not advantageous.

For a fair sized pond I would recommend the often neglected *Ranunculus aquatilis*, commonly known as

as Water Crowfoot. I like this plant very much as when a mass of these plants are in flower in the spring they can make a splendid sight. The plant is peculiar in that it has two types of leaves. The under-water ones are small fine, branched types, whilst the ones which grow on the surface are almost round, shiny and dark green. The flowers are white and like miniature buttercups in shape. I remember some years ago I had removed some coldwater cisterns from my garden and as it rained immediately after I did not fill in the hole. After a time a small pool formed and to my surprise a good group of Water Crowfoot appeared and flowered. The effect was very attractive and this plant has always been a favourite with me ever since. The plant must have grown from seed from somewhere as I had not had any of this species before that. When growing in a river the leaves are all very fine, but in fairly still waters the pretty round leaves appear on the surface. This plant is a good oxygenator and is not poisonous as most of the other *Ranunculus* are.

A good plant for the cold tank is *Hygrophila polysperma*, one of my favourites for the furnished tank. I believe that this plant was not allowed in furnished tank competitions but why I shall never know. It is the coldwater aquarist's "cold" *Ludwigia*, bearing a very close resemblance to this plant but being hardy as well. The shapely leaves are well coloured and it is a very attractive plant in a tank and can be controlled with ease.

The *Vallisnerias*, or Tape Grasses, are very useful plants for the tank but I do not recommend them as pond specimens. One of the finest for the tank is *Vallisneria spiralis* var. *torta*. This plant will thrive in a cold tank in the house and it has many thin, blade-like leaves which are twisted. The plant increases by runners and if grown in a base compost which incorporates a little loam at the back of the tank, will soon make an impressive display.

The ordinary *Vallisneria spiralis* grows with a straight leaf and is better for the tall tank, as the leaves can grow quite long and ribbon-like. Once these leaves run about on the surface of the water its effect is not as good. There is a larger type known as *V. spiralis* var. *gigantea*, which is a good oxygenator with a broader leaf suitable only for the larger tank.

Sagittaria natans, is another good plant for the tank but not for the garden pond. This makes a bunch of slender leaves but it is a good plant for decoration and is a fair oxygenator. This is quite a large Genus comprising of some 33 species, many of which are not very different from those named and are not worth a place in the ordinary tank. *Potamogeton crispus*, is a plant which can be used either in the pond or in a tank. As a pond plant it is inclined to get out of hand unless kept well under control. The handsome leaves make this plant a useful one for the decorative tank. The half-inch-wide leaves are wavy and tapering and can be

three or four inches long. Some leaves are green whilst others have a strong reddish-brown colour and so are quite attractive in the tank. *P. natans* is another species which finds favour with some aquarists. The leaves of this plant are narrow and long whilst the upper ones can float on the surface and are much broader and showy. There are many species of *Potamogeton*, almost a hundred, but those mentioned are the more useful and more readily obtained.

Nitella gracilis is a subject for the coldwater tank but is not to be recommended for the pond as it can become a mass in a short space of time. This plant is very slender with leaves of an olive-green colour. *Myriophyllum* species offer several good plants for the tank and *M. pinnatum*, although usually grown as a tropical plant will grow well in an indoor tank of cold-water. There are many species of this Genus but they are mostly bog or marsh plants and soon get out of hand in an outdoor pond which is in a warm position.

Lysimachia nummularia is wholly a marsh or bog plant but sometimes shoots will survive for a long time in a tank but it is not likely to be of any use as an oxygenator. *Hottonia palustris* is a handsome plant for the pond or tank with pretty pinnate foliage. It produces whorls of lilac flowers above the surface and is quite a good oxygenator.

Fontinalis antipyretica is a moss-like plant which can be used in the furnished tank as a low growing specimen. It is commonly known as Willow Moss, and can often be found in nature attached to a piece of wood or stone. If such a specimen can be found it is unwise to try to detach it from its anchorage and the whole should be transported to the tank. It is quite a good oxygenator although the leaves are tiny and the mass of leaves will often be a trap for small creatures such as shrimps and water lice.

Eleocharis acicularis, known as Hair Grass, is a short-growing plant often used in furnished aquaria. The little tufts of thin stems and leaves look very attractive if correctly planted. This needs careful work when setting up an exhibition tank as careless planting can make an awful mess whereas a well-arranged specimen or two can be most attractive. *Callitriche verna* is also known as Starwort, and is a very bright plant for the tank in the spring. The bright green leaves are attractive but it should not be introduced into the garden pond as it can become very prolific and outgrow many other subjects. For the coldwater tank it is quite good as an oxygenator and it does not appear to object to quite cold conditions.

There are a few other water plants of the oxygenating type which can be tried and even some which are only recommended for the tropical tank can be grown with success in a tank kept in a living room with a mean temperature of about 60°F. In a further article I shall deal with water plants for the pond, other than the oxygenators.

KEEP THE HEAT IN

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making proper contact with its support. A further word of warning concerns the type of adhesive one uses; this should not contain highly volatile components such as found in many quick-bonding adhesives today. The reason for this is simply that such adhesives rapidly dissolve the polystyrene at the point of contact leaving a ragged hole. It is therefore wise to be guided by the experience of the retailer when purchasing adhesive for this purpose. Whilst on the subject of insulating aquaria, it is as well to turn to the insulation of the room, shed or fish-house in which the aquaria are kept, with special attention being paid to doors and windows. Presuming it is an out-house, draught excluders should be fitted to the doors if necessary and unless one has double glazing, thick polythene sheeting should be spread across windows. This should be done so that a gap of at least an inch lies between the surfaces. Provided the polythene is well sealed around the window frame, it will act as a fairly good substitute for double glazing. A last point worth remembering is to always keep a cover-glass over the aquarium. This not only keeps dust out but keeps fish in and of courses reduces heat loss.

BOOK REVIEW

The Pictorial Encyclopædia of Fishes by DR. STANISLAV. Published by Paul Hamlyn at £1.75.

This latest addition to the series of Hamlyn Encyclopædias (which includes, so far, works on Plants and Flowers, Birds, Railways, and Insects) is extremely good value for money. Systematically dealt with, the fishes covered are representative of species found in every type of habitat from a tropical puddle to a coral reef, from a European pond to the depths of the Pacific Ocean. Dover soles, sticklebacks, sting-rays and tetras—they are all here.

While the text must, perforce, be brief, it is terse rather than sketchy and supplies the requisites expected of a lavishly illustrated encyclopædia (there are 902 photographs, 78 of them in colour). Giving location of the genus and descriptions of the representative species, there follows, in most cases, an outline of aquarium requirements, where relevant, and breeding habits.

As the consultant editor is Alwyn Wheeler of the British Museum, complete reliance can be placed in the current accuracy of the nomenclature and classification employed. The *Puntius/Barbus* schools are both catered for by both appellations being applied where appropriate.

The photographs are of the highest quality and are the substance of a reference book for identification which will become, for many aquarists, a well-thumbed companion.

THE Silver Shark

by J. Hems



THE SILVER or bala shark is extensively found in the rivers and lakes of Thailand and Indonesia. It is a cyprinid or carp and attains perhaps 12-14 in. in the natural state, but less than half that in captivity. It is a species that frequents all levels of the water, is non-aggressive, and has a fairly wide range of temperature, that is to say from the low seventies to the upper eighties (°F.). A great point in its favour—as a fish for the decorative aquarium—is that it does not uproot the plants or chew them to shreds. It will, however, browse on soft *algae*, and is a lively and graceful swimmer. In addition to these admirable qualities it is most handsomely coloured. Indeed, a well-grown specimen in good condition is a joy to behold.

In outline the fish is elongated spindle-shaped. In colour it is silver, dark above and light, almost whitish, below. The scales are quite large and reflect the light like a shattered looking-glass: a looking-glass reflecting the golden tints of the sun. The pectoral fins are clear, the other fins are yellow inclining to orange, with black posterior markings. The mouth is flexible and protractile and bears no barbels at the corners. As in other cyprinids, the teeth are in the throat and grind the food against a bony plate on the base of the skull.

The silver shark was described for science by the Dutch ichthyologist, Pieter Bleeker, in 1850. Originally he included the fish in the genus *Barbus*, but later he reached the conclusion that he had placed the fish in the wrong generic slot and erected a new genus, *Balantiocheilus*, for it to reside in. But more than a hundred years passed before *Balantiocheilus melanopterus*, to give the fish its proper or formal name, appeared in the tanks of the dealers (in 1955, to be precise).

Perhaps not unnaturally for a fish that exceeds middle finger length and is active into the bargain, the silver shark grows best and lives longest in a spacious aquarium. A tank of about 36 in. by 15 in. by 12 in. will do, but a 48 in. by 15 in. by 12 in. will suit it better. It should be furnished with clean sand and plenty of plants. Its companions (if it is housed with other fishes not of its own kind) should be of about

its own size. Fishes such as the great scissortail (*Rasbora caudimaculata*) and the giant danio (*Danio malabaricus*) are among the most suitable.

Sometimes the silver shark will jump without the least provocation. The aquarist, therefore, must ever be on guard against the fish leaping to its own destruction. In short, the tank should not be left uncovered.

All aquarists of any experience and wide reading know that the quality of water is of great importance to fishes and probably every species has its own likes and dislikes in the matter of hardness and acidity. But the silver shark, like most cyprinids, is an adaptable species that thrives in any clean and well-aerated water maintained in the middle to upper seventies (°F.).

A difficulty is, however, that some specimens can be finical or indifferent feeders. This is a failing of some other home aquarium sharks (about as unlike the sharks of popular conception as fleas are to ferrets). Therefore it is essential, when buying a silver shark, to choose a fish that is well-fleshed on the sides, has well-shaped fins, and appears to have plenty of energy. Small specimens that show lean sides, a slightly arching ventral surface, and sluggish movements should be left alone: at best they'll turn out to be poor or indifferent feeders, at worst diseased.

Ordinarily the silver shark will snap at any food (alive or dried) moving in the water. It will also search for, and take, food moving or still from the bottom. It flourishes well on a mixed diet of various worms, tiny fragments of red meat, and flake food or wheat germ direct from the packet. In an *algae*-free tank greenstuff such as cooked spinach or finely chopped brussels sprouts should be offered every so often.

The external sex distinctions of *B. melanopterus* are not known to the writer, and there appears to be no mention in the literature of the hobby of the fish having bred in captivity. Yet I suppose this will be accomplished before long, with large fish in a massive tank equipped with all the clever apparatus that makes modern fishkeeping and breeding so much easier than it was a decade or so ago.



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 5th of the month preceding the month of publication.

RESULTS of the first annual Open Show of the Hertford County A.S. were as follows: Guppies: 1, D. Neworthy (Peterlee); 2, Mr. Gillespie (Castledford); 3, Mr. Barnby (Ince-in-Sheffield); Platies: 1 and 2, I. Heptinstall (Castledford); 3, Mr. Elliott (Bishop Auckland); Swordtails: 1, Mr. Greenly (Stockton); 2, T. Scothern (Peterlee); 3, Mr. Welford (Cleveland); Mollies: 1, W. Worrall (Peterlee); 2, C. Houghton (Houghton); 3, Mr. Unsworth (Stockton); Small Barbs: 1, Mr. and Mrs. Atwell (Billingham); 2, W. Worrall (Peterlee); 3, H. Hubbard (Peterlee); Large Barbs: 1, R. Davison (Peterlee); 2, E. Buck (Hetton); 3, I. Heptinstall (Castledford); Small Characins: 1, P. Rivett (Hetton); 2, Mr. Thickbroom (Castledford); 3, I. Heptinstall (Castledford); Large Characins: 1, Mr. Duncanson (Priory); 2, Mr. Thickbroom (Castledford); 3, Mr. Welford (Cleveland); Dwarf Cichlids: 1, 2 and 3, I. Heptinstall (Castledford); Large Cichlids: 1, C. Enright (Houghton); 2, Mr. Thomas (Castledford); 3, D. Neworthy (Peterlee); A.V. Angelfish: 1, Mr. Elliott (Bishop Auckland); 2, C. Enright (Houghton); 3, P. Bailey (Hetton); Rasboras and Danios: 1, I. Heptinstall (Castledford); 2, Mr. Watson (Hartlepool); 3, Mr. and Mrs. Atwell (Billingham); Sharks and Labrets: 1, Mr. Gates (Castledford); 2, Mr. Gillespie (Castledford); 3, Mr. Duncanson (Priory); Corydoras: 1, Mr. Wells (Doncaster); 2, I. Heptinstall (Castledford); 3, Mr. and Mrs. Atwell (Billingham); Catfish and Loach: 1, Mr. Walker (Stockton); 2, Mr. Walker (Stockton); 3, Mr. Low (Cleveland); E.L.T.C.: 1, Mr. Stephens (Stockton); 2, I. Heptinstall (Castledford); Pairs (Livebearers): 1, D. Neworthy (Peterlee); 2, Mr. Walker (Stockton); 3, I. Heptinstall (Castledford); Pairs (Egg-layers): 1, Mr. Kilvington (Doncaster); 2, Mr. Walker (Stockton); 3, Mr. Whitlock (Tadcaster); Breeders (Livebearers): 1, Mr. Robertson (Ashington); 2 and 3, G. Hunt (Ashington); Breeders (Egg-layers): 1 and 3, I. Heptinstall (Castledford); 2, Mr. Wells (Doncaster); Fighters: 1 and 3, Mr. Low (Cleveland); 2, Mr. Thomas (Castledford); A.O.V. Labyrinth: 1, D. Neworthy (Peterlee); 2, Mr. Walker (Stockton); 3, Mr. Gillespie (Castledford); A.O.V. Tropical: 1, H. Hubbard (Peterlee); 2, Mr. Cook (Peterlee); 3, Mr. Thomas (Castledford); A.V. Coldwater: 1 and 3, C. Meist (Hetton); 2, M. Turnbull (Hetton); Junior Section: 1 and 3, R. Milson (Hetton); 2, Master Cook (Doncaster); Furnished Jar: 1, Mr. Duncanson (Priory); 2, J. Summerill (Hetton); 3, Mr. and Mrs. Atwell (Billingham).

THE results of the Barnsley open show were as follows:—Guppies: 1, W. Bastow (Castledford); 2, G. Thickbroom (Castledford); 3, Simpson and Horsfield (Barnsley); Platies: 1, M. Buxton (Sheffield); 2, D. Airton (Sheffield); 3, A. E. Heap (Blakborough); Swordtails: 1 and 3, N. R. Gibson (Huddersfield) (Section Winner); 2, Mr. and Mrs. Cohen (Castledford); Mollies: 1, Master M. Hiskop (Sunnington); 2, Mr. and Mrs. K. Stoney (Sunnington); 3, Mrs. Whiteley (Aireborough); A.O.V. Livebearer: 1, Mr. and Mrs. Cohen (Castledford); 2, R. Hinko (Sunnington); 3, Mr. Waddington (Barnsley); Small Characins: 1, Mr. and Mrs. F. Buxton (Aireborough) (Section Winner); 2, G. Thickbroom (Castledford); 3, E. Smith (Sheffield); A.O.V. Characin: 1, G. Thickbroom (Castledford); 2, Miss A.

Gregory (Nelson and Colne); 3, Mr. and Mrs. F. Buxton (Aireborough); Dwarf Cichlids: 1, N. R. Gibson (Huddersfield); 2, Mrs. Blades (Workop); 3, Simpson and Horsfield (Barnsley); Angelfish: 1, Mrs. Blades (Workop) (Section Winner); 2, J. A. Whiteley (Aireborough); 3, J. Burton (Huddersfield); A.O.V. Cichlid: 1, S. A. Thomas (Castledford); 2, Mr. Scarr (Selby); 3, G. Thickbroom (Castledford); Small Barbs: 1, J. A. Whiteley (Aireborough); 2, Mr. Carr (Doncaster); 3, E. Smith (Sheffield); A.O.V. Barbs: 1, E. Smith (Sheffield) (Section Winner); 2, Mr. and Mrs. Cohen (Castledford); 3, I. Rowbottom (Hyde); Catfish and Loach: 1, Mr. Shipley (Selby) (Section Winner); 2, Bryant and Barraclough (Barnsley); 3, N. R. Gibson (Huddersfield); Sharks and Foxes: 1, Mr. Scarr (Selby); 2, Mr. and Mrs. Cohen (Castledford); 3, G. Thickbroom (Castledford); S. Fighters: 1, 2 and 3, Mr. and Mrs. Cohen (Castledford); A.O.V. Anabantid: 1, Mr. and Mrs. Cohen (Castledford) (Section Winner); 2, Mr. Scarr (Selby); 3, Mr. and Mrs. K. Stoney (Sunnington); Danios, Rasboras and Minnows: 1, Master A. Kaye (Top Ten) (Section Winner); 2, J. Burton (Huddersfield); 3, Mrs. Blades (Workop); Egg-laying Tooth Carps: 1, Simpson and Horsfield (Barnsley) (Section Winner); 2, E. Smith (Sheffield); 3, Mr. Midpass (Sunnington); Breeders (Egg-layers): 1, E. Smith (Sheffield) (Section Winner); 2, Mr. and Mrs. Cohen (Castledford); 3, Mr. and Mrs. F. Buxton (Aireborough); Breeders (Livebearer): 1, Miss R. Kaye (Top Ten) (Section Winner); 2 and 3, Mr. and Mrs. Cohen (Castledford); Pairs (Livebearer): 1, J. A. Whiteley (Aireborough) (Section Winner); 2, Mr. and Mrs. J. Broadhead (Huddersfield); 3, D. Airton (Sheffield); Pairs (Egg-layers): 1, Miss R. Kaye (Top Ten) (Section Winner); 2, J. Burton (Huddersfield); 3, Mr. Carr (Doncaster); A.O.V. Tropical: 1, M. A. Donaldson (York) (Section Winner); 2, Mr. Shipley (Selby); 3, A. E. Heap (Blakborough); A.V. Coldwater: 1, Mr. and Mrs. Toyne (Sheffield); 2, Master A. Kaye (Top Ten); 3, A. Barry (Hyde); Best Fish in Show: E. Smith (Sheffield) A.O.V. Barbs.

OFFICERS elected at the recently well-attended annual general meeting of the Stevenage A.S. were—Chairman: B. Hancock; Vice-Chairman: G. Matthews; Secretary: Mrs. G. Matthews, 87 Mobsbury Way, Stevenage, Herts.; Treasurer: G. Matthews; Show Secretary: P. Downes, 161 Archer Road, Stevenage, Herts.; Assistant Show Secretary: G. Ward; Publicity Officer: Mrs. R. McAuley; Fund Raising Secretary: R. Cook, Jr.

Newcomers to the hobby who would care to join would be welcome at the meetings held on the first Wednesday in each month at the Bedwell Community Centre, Stevenage, and will be sure of a warm welcome.

MORE than forty members were present at the Annual General Meeting of the Hounslow and District A.S. to hear the retiring chairman, Ray Scurry, speak of the success of the Society's activities during the past year and specially thanked Derek Woodward who has been Hon. Secretary of the Society for many years. Unfortunately he is leaving the district to live in

Sussex and will be missed by his many friends in the Society. Bob Nelham was also thanked by the chairman for his sterling work for the members in his capacity of Social Secretary. During the election of officers Peter Cairns of the Runnymede A.S. was in the chair. The following members were elected to serve on the new committee—Chairman: R. Scurry; Vice-Chairman: Mrs. R. Brewer; Secretary: H. Parish; Assistant Secretary: R. Nelham; Treasurer: Mrs. S. Parish; Assistant Treasurer: H. Pratt; Social Secretary: R. Nelham; Show Manager: B. Sheppard; Show Secretary: D. Brook; Press Secretary: Mrs. R. Brewer; Librarian: J. Squires; Public Relations Officer: R. Allan; Floor Members: H. Pratt, M. Collins. Visitors are always welcome at the meetings which are held at 8 p.m. on alternate Wednesdays at St. Stephen Church Hall, Whitton Road, Hounslow. All enquiries to Mrs. S. Parish, 18 The Barrons, St. Margaret's, Twickenham.

THE officers for 1972 of the Tottenham and District A.S. are as follows—President: D. Nutt; Director: K. Nutt; Secretary: T. Tiffany, 38 Talbot Road, Tottenham, N.15. Phone: 801 1351; Treasurer: L. Clements; Show Secretary: K. Massey; Liaison Officer: S. Mole; Member from the Floor: C. James.

New members are welcome and should contact the Secretary. The winners of the annual awards were as follows: K. Nutt, Plants Cup; S. Mole, Breeders Comp. Cup; K. Nutt, Breeders Comp. Cup (Egg-layers); S. Mole, Knockout Competition Cup; L. Pry, Home Furnished Aquaria; J. Hills, Best Fish at Open Show; L. Pry, Saline Cup.

A LIMITED Show was staged recently by the Bath A.S. for the Severnside Association. This proved to be a great success, it is hoped that one of the clubs who entered will stage a similar show next year; there were a total of 334 entries. The results as follows: Guppies: 1 and 3, R. Harvey; 2, R. Clark; 4, W. Burton; Mollies: 1, C. Scriven; 2, P. Greenwood; 3, M. Bishop; 4, S. Daniels; Platies: 1 and 2, W. Short; 3, A. Pumford; 4, B. Derrick; Swordtails: 1, C. Russell; 2 and 3, J. Derrick; 4, G. Ball; Barbs: 1, C. Phipps; 2 and 3, Mrs. Martin; 4, E. Short; A.O.V. Barbs: 1, A. Holmes; 2, T. Fowler; 3, C. Russell; 4, R. Hyett; H. & H.: 1, M. Patrick; 2, A. Pumford; 3, E. Daniels; 4, S. Green; A.O.V. Characins: 1, R. Lunt; 2, D. Hayter; 3, J. Derrick; 4, J. Ferguson; Fighters: 1, W. Burton; 2, Mrs. Bager; 3, S. Daniels; 4, R. Bishop; Livebearers: 1, R. Harvey; 2, A. Hilliard; 3, T. Hamshire; 4, K. Lerway; Corydoras Cati: 1, P. Lewis; 2 and 3, A. Pumford; 4, T. Fowler; A.O.V. Catfish: 1, P. Rowse; 2, J. Sheppard; 3, E. Daniels; 4, Mrs. Butcher; Loach, Botia, Bels: 1, P. Lewis; 2, A. Hilliard; 3, M. Jones; 4, K. Watkins; Large Cichlids: 1, J. Roberts; 2, S. Green; 3, T. Hamshire; 4, R. Bishop; Dwarf Cichlids: 1, J. Sheppard; 2 and 3, P. Lewis; 4, M. Bishop; Rasboras: 1, R. Harvey; 2, M. Patrick; 3 and 4, D. Walsh; Danios: 1 and 2, A. Pumford; 3, A. Buckley; 4, M. Samuels; A.O.V. Tropicals: 1, C. Russell; 2, M. Bishop; 3, Mrs. Bacher; 4, S. Scudamore; Breeders (Egg-layers): 1 and 2, C. Jeffreys; 3, C. Scriven; 4, Mrs. Martin; Breeders (Livebearers): 1, B. Derrick; 2, A. Buckley; 3, C. Phipps; 4, M. Samuels; Goldfish: 1, Mrs. Butcher; 2, D. Phippen; 3 and 4, N. Butcher; Shubunkin: 1, K. Daniels; 2, D. Phippen; 3 and 4, B. Webb; Fancy Goldfish: 1 and 2, E. Rees; 3, A. Lerway; A.O.V. Coldwater: 1 and 3, M. Jones; 2 and 4, T. Hayward; A.V. Pairs class was set aside for club entries only: 1, N. Binding (Bishop's Cleeve); 2, M. Samuels (Trowbridge); 3, M. S. Jones (Stroud); 4, D. Noble (Yate).

MEMBERS and visitors were warmly welcomed at the Fancy Guppy Association Central Sussex Section November meeting by the Chairman, D. Soper, when Christmas arrangements were decided. The Table Show results were as follows: Junior Male: R. Soper; Junior Breeders: J. Soper; Superb: J. Soper; J. McNabb; Natural: J. McNabb; Colour Female: Mrs. Stringer; Breeders (Male) and

Breeders (Female): Mr. and Mrs. Elmes, Lyre Tail; Mrs. Stringer, Short Dorsal Veil Tail; Mrs. Stringer, Long Dorsal Veil Tail; Mrs. Stringer, Colour Male; Mrs. Stringer, Breeders (Pairs): Mr. and Mrs. Elmes. Any information on the Section may be obtained from the Secretary, Mr. R. Elmes, 24 Sunview Avenue, Peachhaven 2534.

MEMBERS of Grimsby and Cleethorpes A.S. held two good talks on breeding at the twice-monthly meetings in October. These were given by G. Dixon and G. Wells, who lectured on breeding the Coradoras Catfish. Table Show results: Corydoras Cats: 1, W. Bailey; 2, L. Evans; 3, L. Dearden. Large Cichlids: 1 and 3, M. Robinson; 2, R. Jennings. Male Guppies: 1, J. Grant; 2, P. Grant; 3, B. Pulford. A.O.V. Catfish: 1, B. Pulford; 2 and 3, T. Walker. Breeders (Egglayers): 1, T. Thompson; 2 and 3, M. Robinson.

At the following meeting members were given the opportunity to judge a small Table Show and the judge then gave his reasons how he had made his selections. A quiz show was the main item at the second meeting. Table Show results: Dwarf Cichlids: 1, 2 and 3, R. Jennings. Breeders (Livebearers): 1, C. Easton; 2 and 3, L. Dearden. Male Swords: 1 and 3, B. Pulford; 2, G. Lill. Sharks: 1, R. Jennings; 2, J. Grant; 3, L. Dearden. Anabantids: 1, C. Easton; 2, L. Evans; 3, L. Dearden.

THE Annual Table Show of the Bath A.S. was held at the end of October. The evening was well supported and the results were as follows: Guppies: 1, T. Sullivan; 2, C. Phipps; 3, J. Webb. Livebearers: 1, Mrs. W. Short; 2, D. Sullivan; 3, C. Russell. H. & H.: 1, A. Holmes; 2, S. Daniels; 3, E. Short. A.O.V. Characins: 1, R. Lane; 2, S. Daniels; 3, A. Holmes. Fighters: 1 and 2, S. Daniels. Labyrinth: 1, T. Fowler; 2, S. Daniels; 3, J. Webb. Barbs: 1, C. Russell; 2, T. Fowler; 3, A. Holmes. Large Cichlids: 1 and 3, C. Russell; 2, C. Phipps. Rasboras and Danios: 1, V. Legg; 2, E. Short; 3, D. Phipps. Catfish and Loaches: 1, D. Phipps; 2 and 3, T. Fowler. A.O.V. Tropical: 1, C. Russell; 2, J. Roberts; 3, E. Short. Sexed Pairs: 1, T. Fowler; 2, F. Rowell; 3, A. Holmes. A.V. Coldwater: 1 and 2, D. Phipps; 3, K. Daniels. Breeders (Egglayers): 1, A. Holmes. Breeders (Livebearers): 1, S. Daniels; 2, J. Ferguson; 3, C. Phipps. Junior Class: 1 and 2, D. Sullivan; 3, K. Daniels. Furnished Jar: 1, S. Daniels. Best Fish in Show: Mrs. W. Short. Highest No. points: S. Daniels.

At the Annual General Meeting the following officers were elected to serve for the coming year: Chairman: T. Callow; Vice-Chairman: F. Grogan; Secretary: E. Short, 22 Caledonian Road, East Twerton, Bath BA2 3RB. Tel.: Bath 26028; Assistant Secretary: Mrs. W. Short; Show Secretary: S. Daniels; Treasurer: J. Webb; Committee: C. Russell, Mrs. V. Russell, C. Phipps, Mrs. M. Grogan, Mrs. E. Daniels.

THE first meeting of the Aberdeen A.S. for the New Year takes place on Tuesday, 18th January, at 7.30 p.m. in the Y.M.C.A. rooms. Main item of the evening will be a "Bring and Buy" Sale where donations of any nature are provided by members, and there are then auctioned, the proceeds going to help run the Society. There will also be a Slide Show and a Quiz. The Show classes are as follows: Pairs (Livebearers) A.V.; Large Cichlids; Pairs Characins.

TWENTY-EIGHT members attended the November meeting of the **Dorchester and District A.S.** to hear M. Cleall, the Vice-Chairman, give an interesting lecture on breeding Guppies. This was followed by a Table Show for Male Guppies. Results: 1, R. Christopher; 2, Miss L. Norman; 3 and 4, P. Jeffries. The Secretary is P. Jeffries, 35 Weathbury Way, Dorchester.

THE Torpoint and District A.S. held its annual general meeting in November when the following officers were re-elected: Chairman: B. Selby; Secretary: D. Medway, 20 Harvey

Street. Phone: 302. Owing to the Treasurer retiring John Lee took on the job for the first time. The Show Secretary is A. Ayers, 6 Arthur Terrace, who is also new to the job. Mr. Slee, ex-Treasurer, gave a brief account of the club's funds before handing over to Mr. Lee. The club is now a member of the F.B.A.S. and meets on the first Tuesday of each month. Everybody is welcome. Please call or phone the Secretary.

THE November meeting of the Bristol Tropical Fish Club marked the end of an extremely successful year for the club and the Annual General Meeting took place. The retiring Secretary was able to report that membership had remained steady at around seventy during the year and the retiring Treasurer reported the highly successful Annual Open Show provided the best financial returns to-date putting the club funds in an extremely healthy state. The following members were elected for office: Life President: Les Littleton; Chairman: W. Holland; Vice-Chairman: R. Parsons; Secretary: P. Shorland; Asst. Secretary: To be elected; Treasurer: R. Toogee; Reporting Secretary: R. Chapman; Programme Officer: M. Ellick; Asst: P. Lewis and R. Lawrence; Librarian: P. Chapman; Auditors: G. Furber and M. Taylor.

For the organisation of the 1972 Open Show the following members were elected: Show Manager: L. Littleton; Show Secretary: R. Lawrence; Assistant Show Sec.: P. Lewis; Electricians: R. Giles and G. Furber; Floor Members: R. Day and T. Coggins.

The B.T.F.C. look forward to an equally successful year in 1972 for which a varied series of monthly speakers and films are being planned with club outings where possible. The club members would very much like to see more new faces amongst their members and extend an invitation to visitors and new members to attend the monthly meeting held on the third Thursday of each month at the National Dock Labour Board Social Club, Welsh Back, Bristol, commencing at 7.30 p.m. Alternatively, details may be obtained from the Hon. Sec., P. J. Shorland, 4, Fernbank Road, Redland, Bristol.

THE main item at the New Forest A.S. evening meeting was a talk by club member, Stan Bray, on water conditions and filtration. He explained the changes that take place in the water and the need for filtration. He also made points for and against the various types of filters. All members present joined in a general discussion of this subject at the end of the lecture. The Table Show was judged by J. Jeffrey. Results: Barbs: 1, D. Lane; 2, S. Bray; 3, A. Williamson; 4, R. Travers. Pisces: 1 and 2, D. Lane; 3, L. Menhennet; 4, A. Williamson.

AT the annual general meeting of the Lincoln and District A.S. it was stated that the Open Show was a great success and it was hoped that next year would be even better. T. Dobbs was elected as President and Mr. Croker as Treasurer. The committee members elected were as follows: Mr. Jackson, Mr. Bradshaw, Mr. Smith, K. Kirby, Mr. Sellers, Mr. Pesch, Mr. Rogers. Show Committee: Mrs. Croker, Mr. Shaw, S. Hill, Mr. Fletcher, H. Kohn, and also Show Secretary. The meetings are held on the third Monday of every month at the Liberal Club, St. Swithin's Square, Lincoln, at 7.30, and anyone coming along will be made welcome.

A QUIZ was held on all aspects of the hobby at the November meeting of the **Plymouth District Aquarist's and Pondkeeper's Society.** About thirty members enjoyed a very entertaining evening. The results of the Table Show were as follows: Breeders (Egglayers): 1 and 2, W. Rundle; 3, Mr. Leeder; 4, Mr. Leeder and J. Rundle. Breeders (Livebearers): 1 and 2, Mr. Reid; 3, Mr. Hodge; 4, Mr. Leeder. Best Fish in Show: 1 and 2, W. Rundle; 3, W. Reid.

THE Manchester Section of the Fancy Guppy Association held its annual Open Show in November. The occasion was well supported and altogether there were 316 guppies on show, in 157 entries. The award for Best Fish in

Show and Best Male went to a Topwood entered by D. O'Brien; Best Female went to a Wedgetail entered by H. Baldwin; Best Breeders went to a team of Breeders Pairs entered by D. Glen.

Class winners were as follows: Male Classes—Delta: H. Baldwin. Long Dorsal Veil: Mr. and Mrs. Warburton. Short Dorsal Veil: T. Hallett. Fantail: G. Steadman. Topwood: D. O'Brien. Bottomwood: M. H. Delingpole. Doubleword: A. Swain. Colour Male: Mrs. P. Young. Original Veil: A. Charlton. Pintail: I. Peck. Cofer Male: B. Hilton. Dove-tail: G. Steadman. Scarftail: J. Hesketh. Lyretail: Mrs. S. Swain. Female Classes—Superba: G. Steadman. Wedgetail: H. Baldwin. Natural Tail: D. Glen. Scallop-tail: Mrs. J. Croft. Cofer Female: B. Hilton. Round-tail Female: D. O'Brien. Colour Female: J. Hesketh. Breeders Classes—Males: M. H. Delingpole. Females: Mrs. J. Croft. Matched Pairs: D. Glen. Master Breeders: Mrs. P. Young. Advanced Master Breeders: M. H. Delingpole. Ladies Class: Miss J. Johnson.

The Manchester Section of the F.G.A. meets on the first Sunday of each month. Commencing in January 1972 the meetings will be held in the Tudor Room, Longlight Hotel, Belle Vue, Manchester. Further information about the Section can be obtained from the Secretary, P. Campbell, 37 Cardigan Drive, Bury BL9 9LG, Lancs.

THE Kingston and District A.S. jointly with South Park Aquatic Study Society held their combined Open Show in October. The total number of entries was 805 represented in fifty classes, both tropical and coldwater.

The Coldwater entries were a great attraction and many spectators admired the numerous coloured species of the goldfish family. The guest of honour was Mr. Katrina, the well-known authority and now retired lecturer on aquatic plant life. In his eighties and as active as ever, he kindly consented to present the awards and trophies for the tropical section followed later by R. Dudley, Chairman of S.P.A.S.S. who presented the coldwater trophies.

The results were as follows: Best fish in the Show, *Distichodus lusossus*, owned by D. Lambourne of Rothampton A.S. Society with highest points—Basingstoke A.S. Best basic variegated goldfish: W. Leach. Best furnished aquaria: W. Leach. Best barb: L. S. Derrick. Best Characin: D. Lambourne. Best Cichlid: M. Strange. Best Labyrinth: D. J. Mackay. Best Toothcarp: D. W. Ellis. Best A.O.S. Catfish: T. Kinsey. Best Rasbora: D. J. Mackay. Best Danio W.C.M.M.: J. Connolly. Best Loach: M. Carter. Best Mollie: D. J. Mackay. Best Goldfish: H. T. Jago. Best Singletail: W. Leach. Best Veltail: P. S. Kadiwell. Best Fantail: D. Speaks. Best Globe Eye: R. and M. Dudley. Best Featherale: D. Speaks. Best Bubble Eye: G. A. Long. Best Native and Foreign: Mrs. S. Hedges. Best Centarchidae: E. Binstead. Best Koi: Mrs. S. Hedges. Best Breeders: Mrs. D. Barrett. Best Plant: Mrs. J. Arrow. Individual Furnished Aquaria: 1, G. Arrow; 2, S. J. Collins; 3, D. J. Crace; 4, C. Wood. Ac: 1, W. Leach; 2, Mrs. P. Whittington; 3, M. Goss; 4, Mrs. M. Dudley. A.V. Barb: 1, L. S. Derrick; 2, D. J. Mackay; 3, Mrs. A. Pollard; 4, D. Amos. Ila: 1, T. D. Amos; 2, 3 and 4, J. Bellingham. A.V. Characin: 1, D. Lambourne; 2, M. West; 3, J. Connolly; 4, J. Bannan. Co: 1, J. Pollard; 2, B. West; 3, R. Barker; 4, A. P. Taylor. A.O.S. Cichlid: 1, M. Strange; 2, Mrs. I. Strange; 3, J. Meary; 4, D. Haines. Da: 1, D. Dare; 2, Mrs. M. Nethersall; 3, D. J. Wiltshire; 4, M. D. Chapman. Db: 1, B. Bis-

halomid A TABLET A DAY, SENDS WHITE SPOT AWAY
Hillside Aquatics London N12

soon; 2, R. Howes; 3, K. Barrett; 4, R. Wright. A.O.S. Labyrinth; 1, D. J. Mackay; 2, D. King; 3, D. Dare; 4, Mrs. C. Sawford. Beta Splendens; 1, R. Howes; 2 and 4, S. W. Applin; 3, M. Brownrigg. A.V. Egg-laying Toothcarps; 1, D. W. Ellis; 2, R. Longstaff; 3, B. J. Pawley; 4, M. Strange. A.O.S. Tropical Catfish; 1, T. Kinsey; 2 and 3, D. Lambourne; 4, R. J. Baker. A.V. Corydoras and Catfish; 1, K. Dryden; 2 and 4, R. Wright; 3, Mrs. S. Hodges; A.V. Rasbora; 1 and 2, D. J. Mackay; 3, B. J. Pawley; 4, P. J. Brencbley. A.V. Danio and W.C.M.M.; 1, J. Connolly; 2, C. Wood; 3, Mrs. G. Carter; 4, A. Blake. A.V. Loach; 1, M. Carter; 2, Mrs. P. Lambourne; 3, K. T. Clough; 4, B. Binsson. A.O.S. Egg-layer; 1, Mrs. Fordham; 2, D. W. Ellis; 3, M. Strange; 4, J. Meares. N (P-M); 1, W. Mason; 2, J. Bellingham; 3, W. Heather; 4, M. West. N (O-T); 1, Mrs. D. Barrett; 2, R. King; 3, D. Haines; 4, W. Mason. A.V. Guppy (Male); 1, Mrs. C. Sawford; 2, D. Pratt; 3, P. Nicholls; 4, Mrs. A. Lafevre. A.V. Guppy (Female); 1, P. Coyle; 2, Mrs. C. Sawford; 3, J. Batts; 4, M. C. Browning. A.V. Swordtail; 1, M. J. Wood; 2, R. Howes; 3, D. King; 4, B. West. A.V. Platy; 1, A. Blake; 2 and 4, K. Quennell; 3, J. Ransom. A.V. Molly; 1, D. J. Mackay; 2, D. Pope; 3, Mrs. M. Stamp; 4, Mr. and Mrs. P. Hudson. A.S. Livebearer; 1, Mrs. D. Barrett; 2, T. Kinsey; 3, A. Blake; 4, D. J. Mackay. Ua; 1, W. T. Jago; 2, Mrs. S. Hodges; 3, V. Thompson; 4, E. Binstead. Ub; 1, Mrs. S. Hodges; 2, Miss F. Leach; 3, Mrs. P. Whittington; 4, G. Strutt. Uc; 1, W. Leach; 2, Miss D. Morris; 3, D. Speaks; 4, W. Leach. Ud; 1 and 2, T. Longstaff; 3, L. Menhennet; 4, R. and M. Dudley. Va; 1 and 2, P. S. Kadwell; 3, J. Linale; 4, D. Nutt. Vb; 1, D. Speaks; 2, F. Radford; 3, Miss J. Leach; 4, R. and M. Dudley. Vd; 1 and 2, R. and M. Dudley; 3, P. S. Kadwell; 4, N. J. Jago. Vg; 1, A. Tagg; 2, C. A. Long; 3, K. A. Johnson; 4, F. G. Glynn. Vh; 1, D. Speaks; 2, Mrs. P. Whittington; 3, M. D. Cluse; 4, R. and M. Dudley. Vi; 1 and 2, J. Linale; 3, D. Stiles; 4, A. Tagg. Vj; 1, G. A. Fleming; 2 and 3, A. Tagg; 4, F. G. Glynn. Vk; 1 and 3, C. A. Long; 2, D. Speaks; 4, R. A. Coulton. Vl; 1, P. S. Kadwell; 2, J. Bundell. A.O.S. Coldwater; 1, Mrs. S. Hodges; 2, V. B. Hunt; 3, R. and M. Dudley; 4, D. Nutt. Wg; 1, 2, 3 and 4, Mrs. S. Hodges. Wb; 1 and 3, E. Binstead; 2, R. and M. Dudley; 4, Mrs. S. Hodges. X (B-M); 1, J. A. Byrne; 2, D. Nutt; 3, Mrs. J. I. Arrow; 4, D. Haines. X (O-T); 1, Mrs. D. Barrett; 2, W. Mason; 3, B. Binsson; 4, R. Longstaff. X (U and V); 1, H. J. Jago; 2, Miss D. Morris; 3, T. Longstaff; 4, R. M. Whittington. X (W); 1, R. M. Whittington; 2, R. and M. Dudley. A.V. Rooted Plants; 1, Mrs. J. I. Arrow; 2, J. E. A. Marshall; 3, V. B. Hunt; 4, C. A. Elliot. A.V. Plant Cuttings; 1 and 4, Mrs. J. I. Arrow; 2, R. and M. Dudley; 3, S. Freeman. A.V. Floating Plants; 1, M. Goss; 2, J. W. Blackwell; 3, D. W. Ellis; 4, M. B. Cott.

THE Dukeries A.S. held their annual general meeting in November when the officers elected were as follows: President: J. Hutchinson; Chairman: D. Jackson; Treasurer: J. Derris; Secretary: Mrs. L. Derris, 89 Sparken Hill, Worksoop, Notts. Tel.: Worksoop 2975; Show Secretary: M. Woodley, 20 Park Street, Worksoop, Notts.

OFFICERS of the Southend, Leigh and District A.S. for this year are as follows: President: D. Edwards; Vice-President: D. Finch; Secretary: Mrs. J. Norris, 58 Leigh Cliff Road, Leigh-on-Sea; Treasurer: D. M. Ches-

wright; Journal Editor: P. F. Capon; Assistant Editor: L. Mitchell; Librarian: E. Joyce; Assistant Librarian: F. Gardner, P.R.O.; T. Russell; Table Show Secretary: K. Adams; Refreshments Secretary: Mrs. D. Chapman; Committee Member: A. Staples.

EARLY in November the **Telford A.S.** held a meeting when they heard a talk by T. Williams from Weston Park, who spoke about some of his experiences. There were 23 members present.

FOLLOWING the recent annual general meeting the office-bearers of the **Land of Burns A.S.** are as follows: President: D. Potter; Treasurer: O. McConnell; Secretary: G. Brown, 19 Solway Place, Tron; also a committee of three were elected. Meetings: First and third Wednesday of each month in Whitlatts Community Centre, Ayr, at 7.30 p.m. All new members and visitors welcome.

THE last leg of the Six Club Meetings took place on the 22nd November at the **Independent A.S.** venue in Holloway. Members expressed their thanks to C. A. T. Brown who consented to judge the Coldwater classes at very short notice. The final placings were: Independent, 145 points; Hendon, 107 points; Anson, 75 points; Riverside, 72 points; Hampstead, 26 points; and Horsney, 5 points. During the judging members were entertained by a film show.

THE Ilford and District Aquarists' and Pondkeepers' Society November meeting featured a lecture on fish behaviour given by a member, W. Rowe. Two sections of the subject were dealt with, the first being aggressive behaviour, centred on the Stickleback—the most studied fish to date on these lines. Mr. Rowe then went on to the second part of his lecture and described procreation of the stickleback, once again, and also briefly the Bitterling. Also announced at the meeting were the results of the Home Aquaria Competition and these were as follows: 1, D. Seaman; 2, W. Rowe; Joint third: Mr. Knott and Mr. Rendol.

Results of the annual all classes Table Show were as follows: A.V. Barb; 1, J. Rendol; 2 and 4, F. Hattam; 3, M. Beil. A.V. Characin; 1, D. Seaman; 2, N. Roder; 3, G. Irish; 4, F. Hattam. A.V. Labyrinth; 1, F. Hattam; 2, W. Rowe; 3 and 4, M. Hill. A.V. Gichlid; 1 and 3, W. Rowe; 2 and 4, C. Olley. A.V. Catfish; 1, W. Rowe; 2, M. Hill; 3, G. Irish; 4, H. Berger. A.V. Mollie; 1, M. Hill; 2, W. Rowe; 3, F. Hattam. A.V. Swordtail and Platy; 1, W. Rowe; 2 and 4, D. Seaman; 3, R. Ruth. A.V. Male Guppy; 1 and 2, F. Hattam; 3, W. Rowe; 4, R. Ruth. A.V. Female Guppy; 1 and 4, F. Hattam; 2, R. Ruth; 3, W. Rowe. A.V. Tropical Plant; 1, R. Ruth; 2, F. Hattam; 3 and 4, W. Rowe. A.V. Coldwater Plant; 1, H. Berger. Breeders (Egg-layers); 1, J. Rendol; 2, C. Olley; 3, H. Berger. Breeders (Livebearers); 1, W. Rowe; 2, D. Seaman. A.O.V. (Coldwater Fish); 1, W. Rowe. A.O.V. (Tropical Fish); 1 and 2, W. Rowe; 3, D. Seaman; 4, J. Rendol. A.V. Single Tail Goldfish; 1 and 4, H. Berger; 2, F. Hattam; 3, W. Rowe. A.V. Twintail Goldfish; 1 and 3, H. Berger; 2, W. Rowe. Furnished Aquaria; 1, J. Hattam; 2, D. Seaman; 3, W. Rowe; 4, H. Berger.

A RECENT speaker at **Ealing and District A.S.** (P.H.A.S.) was Brian Baker (Uxbridge A.S. & F.H.A.S.) who began his talk on Angelfish "This talk can last up to four hours!" This was an advance indication of the thoroughness of the preparation of the subject matter concerned and soon even non-Angel-fanciers were engrossed in the excellent lecture.

The Final Rounds of the Irvine, Mills Trophies and the K.O. Cup were also staged and the winners were J. Healey (Irvine Trophy), J. Bains (Mills Trophy) and J. Irvine (K.O. Cup). The Society's annual Closed Show will be held on 9 January the Sunday after the annual general meeting (Tuesday, 4 January).

A RECORD number of good quality Goldfish were on the bench at the G.S.G.B. Convention which included a full breeders' class and a

lecture was also given by Mr. A. Fraser-Brunner. Results: Singletails; 1 and 3, D. Morris; 2 and 4, G. Wright. Met. Twintails; 1, D. Morris; 2, S. Tibble; 3 and 4, J. Linale. Nac. Twintails; 1, J. Linale; 2, D. Morris; 3, S. Tibble; 4, W. Cook. Globe-eyes; 1, 2 and 4, B. Herbert; 3, R. Dudley. Brambleheads; 1 and 2, J. Linale; 3, P. Glynn. Pearlscales; 1 and 3, M. Cluse; 2 and 4, M. Dudley. Celestials; 1 and 2, G. Fleming; 3, P. Glynn; 4, L. Betts. Pom-Poms; 1, T. Halpin. Bubble-eyes; 1 and 2, K. Speaks; 3, N. Giles; 4, Mr. Bellamy. Common Goldfish; 1, H. Jago; 2, P. Whittington; 3, Master G. Speaks; 4, C. Beavis. London Shubunkins; 1 and 3, P. Whittington; 2, Miss Linale; 4, H. Berger. Fantails; 1, D. Downing; 2, B. Herbert; 3, R. Dudley; 4, K. Speaks. Orandas; 1, Mr. Bellamy; 2, F. Glynn; 3, Miss R. Berger. Bra'ail Moor; 1, W. Cook; 2, G. Fearn; 3, S. Tibble. Breeders Classes: Singletails; 1, 2 and 4, D. Morris; 3, K. Speaks. Twintails; 1 and 3, J. Linale; 2 and 4, S. Tibble. Globe-eyes; 1 and 3, S. Tibble; 2, B. Herbert. Brambleheads; 1, D. Morris; 2, A. Tagg. Pearlscales; 1 and 2, M. Dudley. Celestials; 1, 2 and 3, J. Linale. Pom-Poms; 1, 2 and 3, T. Halpin. Common Goldfish; 1, Mr. Bellamy; 2, H. Jago. London Shubunkins; 1 and 3, P. Whittington; 2, S. Freeman; 4, Mr. Bellamy. Fantails; 1, B. Herbert; 2, G. Wright. The fish were judged by W. Wilson, J. Bundell, W. Leach and J. Scilwell.

RECENTLY the second leg Inter-Society was held between **Alfreton A.S.** and **Derby Regent A.S.** Best in Show was S. Hill (Tinfoil Barb). Results were: Guppies; 1, 2 and 3, R. Holmes. Platies; 1 and 2, S. Dooley; 3, B. Hicking. Large Barbs; 1, S. Hill. Small Characins; 1, D. Robertson; 2, J. Wright; 3, A. Rowe. Dwarf Cichlids; 1, Mrs. J. Lindley; 2, Mrs. Newton; 3, B. Gascoyne. Sharks and Foxes; 1, D. Robertson; 2 and 3, R. Harlow. Corydoras; 1, Mrs. J. Lindley; 2, Mr. Bull; 3, S. Hill. A.O.V. Catfish; 1, Mrs. J. Lindley; 2, M. Footitt; 3, Mr. Bull. Egg-layer (Pair); 1, S. Hill; 2, M. Footitt; 3, M. Feed. A.O.V. Tropical; 1, Miss J. Cooper; 2, R. Harlow; 3, Mrs. P. Ford. Breeders (Livebearers); 1, B. Hicking; 2, K. Sax; 3, R. Harlow. A.V. Ladies; 1 and 3, Mrs. D. Robertson; 2, Mrs. J. Lindley. A.V. Goldfish; 1, 2 and 3, Mrs. V. Wright. Points: Alfreton A.S., 40; Derby Regent, 35. A very interesting talk was given by A. Lindley on Judging Fish, giving members an insight on the pointing of fish. Details of Alfreton A.S. are available from B. Hicking, 15 Meadow Close, Eastwood, and new members will be most welcome.

OVER fifty members attended the **Castleford and District A.S.** once-yearly members only Show, in November and 76 fish were shown. Best in Show was won by G. Gillespie with a Guppy. Results were: Barbs; 1, B. and I. Hepinstall; 2, A. Barret; 3, Mrs. P. Hepinstall. A.O.V. Livebearers; 1, S. and A. Thomas; 2, A. Barret; 3, Mr. and Mrs. Stevens and Denise. Characins; 1, Mrs. Asquith; 2, D. Hiscock; 3, Mr. and Mrs. Nock and Harvey. Anabantids; 1, E. and S. Glows; 2, Mr. and Mrs. Gates; 3, S. and A. Thomas. Guppies; 1, G. Gillespie; 2, Mr. and Mrs. Stevens and Denise; 3, L. and S. Pitchford. Cichlids; 1, S. and A. Thomas; 2, Mrs. P. Hepinstall; 3, L. and S. Pitchford. Catfish and Loach; 1, Mr. and Mrs. Gates; 2, K. Frew; 3, Mr. and Mrs. Baker and Jimmy. Carps and Minnows; 1, G. Gillespie; 2, Mrs. P. Hepinstall; 3, Mr. and Mrs. Stevens and Denise. Toothcarps; 1 and 2, P. Keith; 3, Mr. and Mrs. Baker and Jimmy. A.O.V.; 1, B. and I. Hepinstall; 2, W. Bastow; 3, G. and G. Thickbroom. Pales; 1, W. Bastow; 2 and 3, Mrs. Asquith. Coldwater; 1, B. and I. Hepinstall; 2 and 3, Mrs. Asquith.

AT THE Dunmow and District A.S. November meeting the evening was opened with a club Quiz, which proved to be very interesting. This was followed by a Table Show which was for Anabantids and Fishers. Results were as follows: 1, Mrs. E. Andrews; 2 and 4, C. De-Cruze; 3, Mrs. W. Smith.

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THE Wrexham T.F.S. held its annual general meeting in September when C. Pritchard was made secretary and at which the members put forward some interesting points and suggestions for the coming year.

The Society held an Inter-Club Show with Chester A.S. in November, at which interest was shown in some marine fish entered by a Chester member. He took the Best Fish in the Show. The highest pointed fish from Wrexham was a *Leone Gourami*, owned by P. Oliver. This brought him the Paramount Trophy for the Fish of the Year.

The meetings are held at The Fellowship Hall, Bradley Road, Wrexham, on the second and last Thursdays of the month. The Secretary is C. Pritchard, "Crugneith," Middle Road, Nant Coedpoeth, Nr. Wrexham.

A VERY interesting lecture was given on Anabantids by Brian Tate at the November meeting of the **Privates A.S.** The meeting was attended by a heartening number of new members and was a great success.

THE October meeting of the South Western Group of the **B.M.A.A.** was held at the home of F. Bye of Exeter, and his fish house produced some interesting comments upon the use of plastic funnels in his U.G. system.

Film slides that were taken at Torbay's Open were received in time for members to see shots of the Society stand and the main topic of the evening was a lively discussion about the showing of fish. All present agreed that the entries of Marine fish at Torbay Open produced a lot of interest from the public. When the visitors were told that practically all the fish in the native section were from local waters, it was noticeable how astonished they were. The majority decision of members was that showing fish is a challenge. A challenge to improve stock, remembering that it is only healthy and peak-condition fish which are suitable for Open Shows.

THE Annual Inter-Club Show between **Yeovil and D.A.S.** and **Weymouth A.S.** was judged by Messrs. Cavell and Edwards from Taunton A.S. and Yeovil were beaten by 167 points to 133 points which enabled Weymouth to retain the trophy. Individual winners were: Tropical: 1, Mr. Worth (Weymouth); 2, Mr. Hatton (Weymouth); 3, Mr. Fischer (Yeovil); 4, Mr. Carter (Weymouth). Coldwater: 1, Mr. Collins (Yeovil); 2, Mr. Worth (Weymouth); 3, Mr. Langdon (Yeovil); 4, Mr. Foster (Weymouth).

The Yeovil and D.A.S. are now holding an extra monthly meeting during the winter programme.

Please note the change of meeting night and venue: First and third Wednesday at St. Michael's Church Hall, Yeovil.

A VERY enjoyable B.K.A. taped lecture and slide show on an aquarist's visit to Ghana was one of the evening's attractions at the **Northwich and District A.S.** monthly meeting. At the annual general meeting the following committee were elected to serve for two years: Chairman: P. Hyland; Press Release Officer: H. Buckley; Table Show Secretary: N. Thompson; Assistant Show Secretary: T. Bailey; Assistant Secretary: J. Bailey; Social and Entertainment Secretary: B. Connelly. A new post created after discussion with all club members present.

The following committee will serve also until up for election in 1972: Show Chairman: L. Thorne; Librarian: C. Davies; Open Show Secretary: Mrs. D. Thorne; Treasurer: B. Pearson; Secretary: L. Bradley, 4 Ash Road, Sandway, Nr. Northwich, Cheshire.

From the officers' reports it was agreed that 1971 had been a very successful year both in achievement at the B.A.K. the open show and also from the financial position. Results of Table Show: Breeders: 1, C. and K. Davies; 2 and 3, R. Knowles. Loaches: 1 and 2, C. and K. Davies; 3, L. Bradley. Fish of the Month Award: C. and K. Davies (Piemont Cichlids).

DUE to illness Ron Eason was unable to give his expected talk to the **Carlhalton and District A.S.** and chairman, Tom Barr, stepped in at short notice and gave a talk on "Tropical Fish Books". From January the club will meet on the first Monday and third Wednesday of every month at "The Sun" public house, North Street, Carlhalton. The emphasis for the New Year will be on the beginner to this fascinating hobby. The results of the November Table Show: Any Variety Tropical Fish: 1 and 2, J. Begbie; 3, and 4 T. Barr.

All members and friends are reminded of the annual Buffet dance on 28th January.

THE **Loughborough and District A.S.** second Annual Furnished Aquarium competition was held in conjunction with the Parks Christmas show in November. The results of the eleven entries was as follows: 1, D. Wood; 2, G. Lindsey; 3, G. Taylor; 4, L. Purdy. Show judge was R. Tedds of Bedworth. A stainless steel furnished aquarium was raffled off in aid of local charities and the winning ticket was No. 101 Pink. Would the winning ticket holder please contact T. H. Parry, Show Secretary, 447 New Ashby Road, Loughborough.

IN November **Mid-Sussex A.S.** welcomed five visiting Societies to the Inter Club Show. The classes of fish were Characins, Rasboras, Labyrinth, Male Guppies and Sexed Pairs Guppies, judged by J. Stillwell. The total points each Society gained were: Tonbridge, 1,131; 2, Mid-Sussex, 1,130; Brighton, 1,174; Crawley, 1,085; Redhill, 956. Mid-Sussex returned the visit of Tonbridge on the following Saturday and took their first prize.

THE November meeting of **GKN Pond and A.S.** took the form of a Quiz set by G. Parker, of the M.A.A.S. An unusually keen contest ensued and the general standard was very high. Thanks are due to Mr. Parker and all participants for a very enjoyable evening.

THE main event at the November meeting of the **Harrogate A.D.A.S.** was a slide show entitled "Discus and Others" by Roy Skipper. The Table Show was a class for Guppies and an A.O.V. class, results being as follows: Guppies: 1, 2 and 3, M. Lewis; A.O.V.: 1, D. Taylor; 2, Mrs. W. Atkinson; 3, D. Peggall. The Harrogate A.D.A.S. wish to extend the compliments of the season to all other aquarist societies.

RESULT of the Inter-Society Table Show held at Chester in November between **Northwich and District A.S.** and **Chester A.S.**: Guppies: 1, T. Bailey (Northwich); 2, R. Dutton (Chester); 3, C. Bowyer (Chester). Mollies: 1, R. Dutton (Chester); 2, T. Bailey (Northwich); 3, L. and D. Thorne (Northwich). Characins 3 in 1: 1, L. and D. Thorne (Northwich); 2, G. M. Jones (Chester); 3, L. Bradley (Northwich). Characins over 3 in 1: 1, R. Dutton (Chester); 2, C. Bowyer (Chester). Large Cichlids: 1, 2 and 3, R. Dutton (Chester). Borias, Loaches, Flying Foxes: 1, P. Hyland (Northwich); 2, C. Bowyer (Chester); 3, T. Bailey (Northwich). Fishers: 1 and 3, R. Dutton (Chester); 2, H. Nuckley (Northwich). Anabantids A.V.: 1 and 2, C. Bowyer (Chester); 3, R. Dutton (Chester). Breeders (Egglayers): 1, C. Bowyer (Chester); 2, G. M. Jones (Chester); 3, T. Bailey (Northwich). Breeders (Livebearers): 1, G. M. Jones (Chester); 2, T. Bailey (Northwich); 3, C. Soak (Chester). Coldwater: 1 and 2, L. and D. Thorne (Northwich); 3, G. M. Jones (Chester). Table Show: Points: Chester, 44 pts; Northwich 27 pts. Quiz winners: Chester.

THE November meeting of the West Midland Group of the British Marine Aquarium Association was very well attended with three new members and there were also a few visitors. The Chairman, Derek Highfield, put on a film of the stand the B.M.A.A. had at Bingley Hall this year and also of his fish at home.

AT the **Keighley A.S.** monthly meeting Mr. and Mrs. J. Lidstone gave a slide show on Austria and Snowdonia. The monthly Table

Show results were: Fish of the month: 1, J. Mosley; 2, Mrs. Heap; 3, Master Cutting. Any Other Variety: 1 and 2, J. Mosley; 3, D. Mosley. Novice A.O.V.: 1 and 3, Mr. Ibbotson; 2, Mr. Illingsworth. Junior A.O.V.: 1, 2 and 3, Master P. Beckett.

THE **Isle of Wight A.S.** has resumed meetings on the second and fourth Wednesdays of each month at the Unitarian Hall, Newport.

The recent trip to the Fourth London Aquarium Show was a great success; the majority of the party, after spending the morning at the Show, visited the London Zoo in the afternoon. The Society also took a number of cards with E. T. Davison taking a first in the Cichlid Class with a Singletail, R. Chapman a first with his Goldfish and B. Shuttleworth a fourth with a Silver Angel.

RESULTS of the **Mixeden T.F.S.** Annual Open Show were as follows: Best in Show: Mrs. Gregory (Oldham)—Checked Barb. Livebearers: Guppy: 1, Miss S. Clarke (Barnley); 2, Mr. and Mrs. D. Stephens (Castleford); 3, Mr. Hart (Keighley). Swords: 1, Mr. Hart (Keighley); 2, R. Hixley (Swillington); 3, W. Ostrawski. Platies: 1 and 3, G. Ibbotson (Keighley); 2, D. Maylan (Blackborough). Mollies: First and Section Winner: Master M. Hills (Swillington); 2, L. Leadbetter (Fleetwood); 3, J. Howard (Valley). A.O.V.: 1 and 3, J. S. Hall (Aireborough); 2, E. S. Clowes (Castleford). Barbs: Small: First and Section Winner: F. E. Gregory (Oldham); 2, F. E. Gregory (Oldham); 3, B. Black (Fleetwood). Large: 1, A. Barrett (Castleford); 2, K. Stafford (Oldham); 3, E. Kershaw (Valley). Characins (Small): First and Section Winner: Mr. and Mrs. Cohen (Castleford); 2, Mr. Hart (Keighley); 3, J. S. Hall (Aireborough). Large: 1, Mrs. Davies (Privates); 2, Mr. Kennedy (Bradford); 3, J. S. Hall (Aireborough). Cichlids (Dwarf): First and Section Winner: Mr. and Mrs. Cohen (Castleford); 2, Mrs. H. Blades (Creswell); 3, G. Malpas (Swillington). Angels: 1, Mrs. H. Blades (Creswell); 2, L. Sillis (Fleetwood); 3, D. Farrer (Independent). A.O.V.: 1, G. Thickbroom (Castleford); 2, K. Aubrey (Privates); 3, J. Jowett (Swillington). Anabantids: Fighters: 1 and 2 and Section Winner: Mr. and Mrs. Cohen (Castleford); 3, M. Tonge (Oldham). A.O.V.: 1, L. Leadbetter (Fleetwood); 2, R. J. Heron (Mixeden); 3, K. Aubrey (Privates). Toothcarps: 1 and 3 and Section Winner: J. Mansley (Keighley); 2, F. W. Coles (Privates). Sharks and Flying Foxes: First and Section Winner: D. Morris (Oldham); 2, G. Hodgkinson (Gorton and Openhaw); 3, Mr. and Mrs. Cohen (Castleford). Danios, Minnows and Rasboras: 1, E. Smith, Jr. (Sheffield); 2, D. Morris (Oldham); 3, E. Birchwood (Oldham). Breeders (Livebearers): 1, Mr. and Mrs. Cohen (Castleford); 2, Miss B. Kaye (Top Ten); 3, J. Mansley (Keighley). Egglayers: First and Section Winner: Mrs. Gear (Keighley); 2, Mr. and Mrs. Cohen (Castleford); 3, E. S. Clowes (Castleford). Pairs (Livebearers): 1, Mr. and Mrs. Cohen (Castleford); 2, L. Leadbetter (Fleetwood); 3, Miss A. Gregory (Nelson). Egglayers: First and Section Winner: Mr. and Mrs. Cohen (Castleford); 2, F. E. Gregory (Oldham); 3, Mrs. H. Blades (Creswell). A.O.V. Tropical: First and Section Winner: Mr. Kennedy (Bradford); 2, P. and H. Batchelor (Loynes); 3, I. Stephenson (Yeck). Coldwater Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Common Goldfish: 1 and 2 and Section Winner: J. S. Hall (Aireborough); 3, J. Brown (Mixeden). A.O.V.: 1, Mr. and Mrs. Toyne (Sheffield); 2, J. S. Hall (Aireborough); 3, G. Thickbroom (Castleford).

DISINFECT NEW PLANTS AND FISH WITH  **Hillside Aquatics London N12**

Ladies Tropical and Goldwater: 1, Section and Best in Show: Mrs. Gregory (Oldham); 2, Mrs. Cohen (Castleford); 3, Mrs. H. Blades (Cresswell). Juniors: 1 and Section Winner: Miss H. Johnson (Ashton-under-Lyne); 2, Master Mark Halyo (Swillington); 3, Miss Denise Stephens (Castleford). Furnished Jar: 1 and 3 and Section Winner: B. Birchwood (Oldham); 2, P. Booth (York).

NOTICE

DURING 1972 a number of amendments to the F.B.A.S. Show Rules come into force, and Societies requiring Federation support for their Open Shows will be expected to conform to the amended Rules.

A first major change is that "optional use of gravel in tanks and show-tiers shall be allowed." Other changes are: that Furnished Aquaria and Aquascapes may be brought ready set up to any Open Show, that Open Show Schedules shall be in accordance with the F.B.A.S. lettering system of classes, that rooted plants shall be shown with their crowns showing.

The Trophy Secretary, Tom Glass, announces that applications for F.B.A.S. Championship Trophies and Major Perpetual Trophies are invited for awarding at Societies' Open Shows. Applications should be in hand by mid-February together with a rough draft of the Show Schedule and a provisional date of the Show. Trophies will be allocated following the closing date on a "fair-share" basis, and Societies are asked to acquaint themselves with the Rules covering the award of such Trophies. Extra perpetual Trophies are available for 1972 (thanks to Societies donating them for Federation use and to date include Awards for Centrarchidae, A.O.S. Goldwater, Veiltail Goldfish, Molliis, Swordtails, Characins and Siamese Fighters (B. splendens). At the time of going to Press the number of Societies affiliated to the Federation now stands at 124—a significant increase over the last year's figure—and this augurs well for the coming season.

NEW SOCIETIES

A NEW Society has been formed in the Darlington area and will be known as the **Darlington & District A.S.** Meetings will be held on the second Wednesday in each month at the "Market Tavern Hotel", Market Place, Darlington, at 8 p.m. Officials are: Hon. Chairman: J. Able; Hon. Secretary: P. A. Bull, 122 Jedburgh Drive; Committee: B. Garrett and W. A. Tweedy.

THE British Koi-Keepers Society would welcome new members. Details may be obtained from the Secretary, Mrs. H. Allen, 1, Anthony Close, Francis Gardens, Peterborough.

SECRETARY CHANGES

Carshalton and District A.S.: K. Thomas, 183 Durand Close, Carshalton, Surrey.

Castleford and District A.S.: J. B. Stevens, 72 Falcon Drive, Love Lane, Castleford, Yorks.

Chingford and District A.S.: General Secretary: R. Harvey, 54 Kenilworth Avenue, Walthamstow, E.17. Show Secretary: I. Hall, 41 Richmond Crescent, Chingford, E.4.

Grimby and District A.S.: M. Robinson, 68 Peakes Avenue, New Waltham, Grimby, Lincs.

Loyne Aquarists, Lancaster: Mrs. N. E. Gardner, 104 Alexandra Road, Morecambe, W.E. Lancs.

Hounslow and District A.S.: H. Parrish, 18 The Barons, St. Margaret's, Twickenham, Middlesex.

Land of Burns A.S.: G. Brown, 19 Solway Place, Troon.

AQUARIST CALENDAR

1972

13th February: Rotherham and District A.S. Third Open Show at Brinsworth Manor School, Brinsworth Lane, Brinsworth. Details and schedules from the Secretary, Mrs. Harrison, 35, Osbert Road, Broom, Rotherham.

5th March: Keighley A.S. Annual Open Show, Victoria Hall, Keighley.

12th March: Belle Vue A.S. Open Show, Openshaw Ladies Club, Crossley House, Ashton Old Road, Openshaw, Manchester. Details from Mr. R. Davies, 39 Wetherby Street, Higher Openshaw, Manchester, 11.

19th March: Top Ten A.S. Open Show to be held at Huddersfield Town Hall.

26th March: Workop A. and Z.S. Annual Open Show at the same venue as last year North North. College of Further Education, Blyth Road, Workop. Schedules available shortly from the Show Secretary, Mr. F. G. Sibson, 17 Clinton St., Workop.

26th March: East Dulwich A.S. Third Open Show. To be held in the Territorial Army Hall at Highwood Barracks, Lordship Lane, S.E.22. Show secretary, K. G. Quinell, 43a Carden Road, Peckham, S.E.15 3JH.

3rd April: Southampton and District A.S. The Avenue Hall, Southampton.

3rd April: Tottenham and District A.S. Silver Jubilee Open Show at the Harringay Sports Council, Drill Hall, High Road, Tottenham, N.17 (opposite the Spurs Ground). Schedules from Show Secretary: K. Massey, 72 Westward Road, South Chingford, E.4. Tel.: 527-7851.

15th April: Bath A.S. Open Show. St. Peter's Hall, Dorset Street, Bath. Schedules available from show secretary, S. Daniels, 21 Haycombe Drive, Whiteway, Bath.

16th April: Medway A.S. Open Show. Details later.

22nd April: Thurrock A.S. Open Show. New venue, Park School, Bridge Road, Grays, Essex. Details from show secretary, D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea.

22nd April: Independent A.S. Open Show—details to be announced later.

23rd April: York and District A.S. Details later.

29th April: Uxbridge and District A.S. New venue, The G.P.O. Motor Repair Depot, Willow Tree Lane, Yeading Lane, Yeading, Hayes, Middlesex. Full particulars available from the show secretary, N. V. Lee, 46 Airedale Road, Ealing, London, W5 4SD.

7th May: Ousam Open Table Show, Recreation Hall, Refuse Street, Shaw, Oldham.

7th May: Coventry Pool and Aquarium Society Open Show, Foleshill Community Centre, Foleshill Road (A444), Coventry. Details later.

7th May: Dukeries A.S. Open Show at the Winifred Portland Technical Grammar School, Sparken Hill, Workop. Show secretary, M. Woodley, 20 Park Street, Workop.

13th May: Southend, Leigh and District A.S.

Open Show, St. Clements Hall, Leigh-on-Sea (not 20th May as previously stated). Show secretary, P. D. Orford, 8 Blenheim Chase, Leigh-on-Sea, Essex.

14th May: Derby Regent A.S. Open Show, Sherwood Foresters Recreation Centre (Normanton Barracks), Oumaston Park Road (A5111), Derby (follow R.A.C. signs). Show Sec.: R. G. Hazlow, 180 Mansfield Road, Derby. Tel.: 44322.

21st May: Yeovil & D.A.S. Open Show, The School Hall, Church Street, Martock, N.Y. Yeovil. Show Manager: Mr. D. Phipps, 5 Hill Terrace, Bowshinton, Martock, Somerset.

21st May: Croydon A.S. (F.B.A.S.) Open Show. Provisional Date. Full details later.

28th May: Corby and District A.S. Open Show. Sunday, Corby Civic Centre. Further details will be available shortly.

4th June: Accrington and District A.S. Annual Open Show. Details later.

Owing to pressure on space the Hetton County A.S. and Barnsley T.F.S. Open Show results have been held over until January issue.

4th June: South Derbyshire and District A.S. Annual members show—details later.

11th June: Thorne A.S. Open Show is to be held in the Thorne Grammar School. All information to H. C. Jewison, 94 Hawthorne Road, Thorne, nr. Doncaster.

11th June: Bishops Cleeve A.S. Third Open Show at the Tythe Barn, Bishops Cleeve on the A435, Cheltenham to Evesham Road. Show schedules will be obtainable from the show secretary, Mrs. M. Scrvin, 27 Warden Hill Road, Cheltenham, Glos.

11th June: High Wycombe A.S. Annual Open Show at Lane End Hall, Lane End, High Wycombe.

18th June: Swillington's Seventh Open Show. Details later.

25th June: Alfreton and District A.S. Annual Open Show to be held at the Adult Education Centre, Alfreton Hall, Alfreton. Details from the show secretary, B. Hickling, 15 Meadow Close, Eastwood, NG16 3DQ.

2nd July: Exeter and District A.S. Provisional arrangements have been made to hold their first Open Show at the Kennford Village Hall, Kennford, Nr. Exeter. Final arrangements will be announced when known and will be available from the secretary, W. F. Bye, 14 Beaworthy Close, Exeter, EX2 9LB. Tel.: Exeter 76936.

2nd July: North Warwickshire A.S. Open Show, The Settlements, Kingstanding Road, Kingstanding, Birmingham. Details from T. Stow, 108 South Road, Erdington, Birmingham, 23.

8th July: Basingstoke A.S. Open Show, Carnival Hall, Basingstoke. Schedules from M. Strange, 10 Laddon Court, Nevills Close, Basingstoke.

16th September: Havant and District A.S. Second Annual Open Show will take place at the Devereil Hall, Purbrook. The show secretary is V. B. Hunt, "Caeglas", 120 London Road, Widley, nr. Portsmouth, Hants.

16th September: Hounslow and District A.S. Open Show at Hounslow Youth Centre, Cecil Road, Hounslow.

24th September: Torbay A.S. Annual Open Show will be held at The Torquay Town Hall. Full details will be advised later.

22nd October: Sherwood A.S. Details later. Show secretary, J. Igoe, 25 Marples Ave., Mansfield-Woodhouse, Notts.



THE BRITISH AQUARISTS' FESTIVAL,
will be held this year at Belle Vue Zoological Gardens Manchester on
SATURDAY 14th OCTOBER and SUNDAY 15th OCTOBER