

MAY 1970

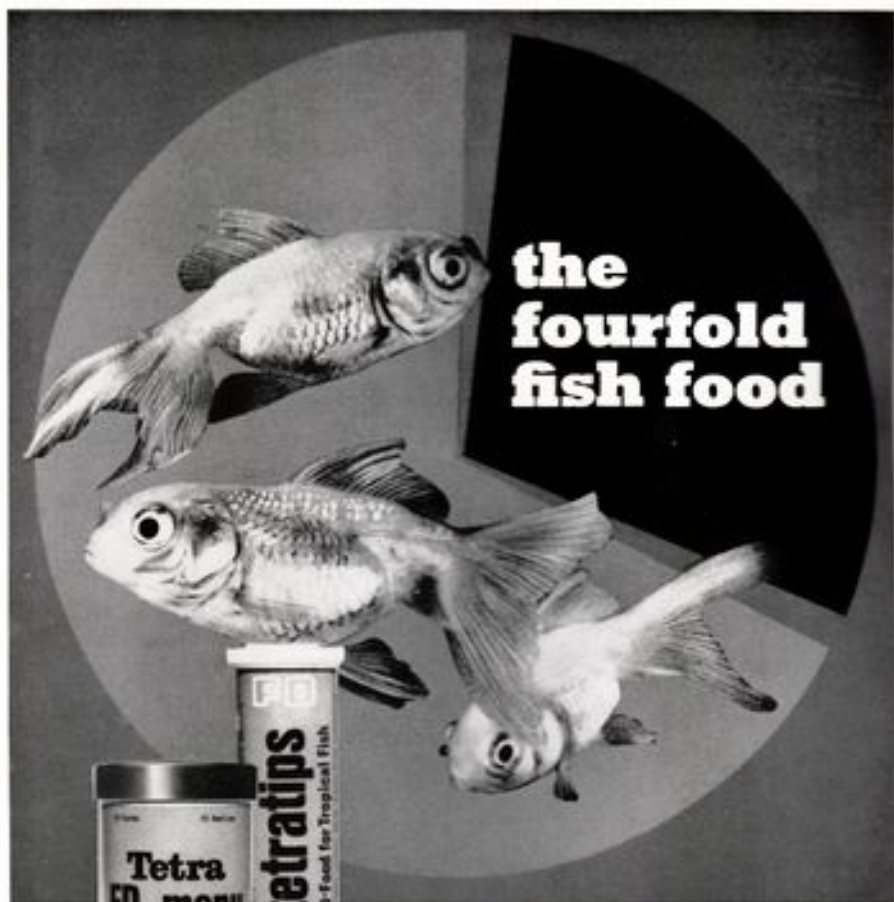
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Monthly 3s

Vol. 5 No. 1

May 1970

Subscription rates: £2 2s for 12 issues; £1 2s for 6 issues (U.S.A. and Canada \$5.50)

Editor: Anthony Evans

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### PetFish Publications

Editorial and Advertising Offices

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London, S.W.17  
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## Comments and Quotes

- Fish Disease and Man
- Tank Frame Coatings
- Algae and Two Veg.

### Fish Disease and Man

TROPICAL fish tanks are often to be found in doctors' waiting rooms but, perhaps fortunately, they rarely feature in the reading matter for the medical profession. We therefore looked with some interest at a report innocently headed 'Tropical Fish Aquariums' in JAMA (THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION) recently. At first sight the observations of the four dermatologists who had written the report seemed to reveal some alarming findings, although on closer reading they had less impact. The authors discussed six patients who had developed unpleasant ulcers of the skin of their hands and arms apparently caused by the micro-organism *Mycobacterium marinum*, which occurs in water and is the cause of a fish disease. All of the patients had cleaned out fish tanks, in which many of the fish occupants had recently died, whilst they had small cuts or abrasions on their hands, and the ulcers developed subsequently.

It was not shown that the fish in the tanks had actually died from *M. marinum* infection but water from the tank belonging to one patient contained the organisms. Despite a check through the public health records and enquiries at fish-breeders' establishments no other reports of such skin infections in fish-keepers were found by the dermatologists, although there have been occasional reports of similar infections apparently acquired in swimming pools. On the facts presented by the report the risk to aquarists does not seem very great, but it has to go on record that here is one infective agent for fish that can under some circumstances also be harmful to man.

### Tank Frame Coatings

A SLIGHT looseness of terminology has become common in the descriptions of aquarium tanks, particularly when recommendations are being made for types suitable for use with sea water. Merely to describe a frame as 'plastic-coated' is not enough to indicate that the tank metal is fully protected from corrosion. The nature of the covering, i.e. whether polythene, polyvinyl chloride (pvc) or nylon, should be specified and, as Mr Ted Lee, well-known tank manufacturer and aquarist of many years' standing, pointed out in a letter in the PET TRADE JOURNAL last month, for legal reasons if for no other it should be specified accurately. The only finish having durable adhesion to metal frames is nylon, says Mr Lee, and although it is more expensive he recommends it as the finish of choice for use with sea water. Some tanks have been described as nylon-coated when polythene has been the covering used, not because deception is being practised but simply because, as we said above, the terminology has become rather lax. Aquarists can help the situation by being aware of the types of coverings in use and specifying their requirements exactly.

### Algae and Two Veg.

IT may well be that at some not too distant date there will be no more envied man than the aquarist whose tanks are green with algae. Algae has been found to contain

about 80% the amount of protein found in dehydrated egg white. The Research Institute for Carbon Biology in Dortmund has already developed the world's first process for raising mass cultures of freshwater algae in open fields and is now building the first algae factory in West Germany for the commercial market. Algae dumplings, algae noodles, mashed algae potatoes and algae ice cream are promised in quick succession. Trial programmes have been started in the developing countries such as India and Thailand

**COLDWATER** fish judges, empowered by the G.S.G.B. Standards booklet to give 'bonus points' to certain goldfish varieties, have now been directed by the Federation of Northern Aquarium Societies' Judges and Standards Committee not to award these points at any show where goldfish varieties compete against tropicals for Best in the Show position or when points count for special awards.

to see if algae fields can be operated in a tropical climate. If successful,

factories could then be built which would each supply up to 30% of the protein needs of 10,000 people. Before the distaff side of the aquarist home starts casting covetous eyes on the fish tank when the green vegetables run short, we should add the comments quoted in the report of these developments in THE NEW SCIENTIST: 'Last year, workers at Bonn's Ministry for Economic Co-operation served as guinea-pigs in an experiment that proved the algae dishes were not only edible, but occasionally appetising'.



Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London S.W.17

### What is Exotic?

WITH reference to Jim Kelly's comment on the term 'exotic' in the March issue of PFM, I think that an exotic pet can be almost any pet, depending upon the beholder. I remember going to my first fish show and seeing the quality of some of the prize guppies. To me, these fish, compared with my own, were exotic, but I doubt whether the owners would have described their prize fish as exotic. I think therefore that an exotic pet could be defined as one that is a very exceptional specimen of its type, or an unusual pet such as a piranha, snake or alligator. To conclude, I don't think a dealer would be wrong in describing a tank of goldfish or guppies as exotic, provided that the fish displayed conformed to my definition.

Stevenage, Herts.

D. C. MASSKELL

### National Standards for Goldfish

I CAN assure you, Mr Savage, that I do not keep a steam roller in my fish house. Such an implement is used for flattening and is not to be used against fellow goldfish keepers with whom we wish to co-operate. My letter in PETFISH MONTHLY (December, 1969) gave a summary of the history of goldfish standards over the past 20 years. It is true that I did not go into details of the discussions at the afternoon meeting at Kidlington on 13th September that Bristol A.S. and M.A.P.S. attended on the invitation of the G.S.G.B. The minutes of that meeting filled two pages of typed foolscap. That meeting was of a purely exploratory nature and G.S.G.B. representatives were not mandated to make any decisions at Kidlington. The meeting was valuable for two reasons. Firstly, it defined the areas of general agreement. Secondly, it brought to light matters upon which we did not all see eye to eye. We listened to criticisms of G.S.G.B. standards which we have been re-appraising, bearing in mind the points raised.

Further consultation with Bristol A.S. has been attempted by G.S.G.B. but has not made much progress. It was several months after the Kidlington meeting that the minutes were acknowledged by B.A.S., which, together with M.A.P.S., had in the meantime been invited to provide details rather more concrete than vague likes or dislikes. There was no response on these lines. G.S.G.B. booked a hall in May 1969 for a B.A.S. versus G.S.G.B. inter-club show and hoped to discuss matters, with actual fish available. B.A.S. was unable to join in. We invited three representatives of B.A.S. to meet three G.S.G.B. Standards Committee members at the G.S.G.B. Convention and show in October 1969 because many actual fish would be available for inspection. This attempt at consultation came to little because of complications not of G.S.G.B. making. What more can we do in co-operation with outside clubs to investigate the possibility of a set of standards generally acceptable in Britain?

Another edition of the G.S.G.B. standards booklet must be issued in 1970 because the stock is almost exhausted. Meanwhile, the G.S.G.B. Standards Committee continues to meet, examines specimen fishes, invites the opinion of various specialist fanciers, produces trial drawings and scrutinises various definitions. It is likely to recommend various amendments to our drawings, none of which we have ever said was sacrosanct.

In order to ascertain whether we can reduce confusion in the hobby regarding show standards, would B.A.S. care to arrange a small meeting with G.S.G.B. to make a joint examination of the shapes of actual fishes of the Bristol and G.S.G.B. singletail types and to compare with existing standard drawings, there being, of course, no prior ultimatum from either side? It must be soon, however, as G.S.G.B. membership awaits an early recommendation from its Standards Committee. The ball is in your court, Mr Savage.

M. D. CLUSE  
Chairman, G.S.G.B. Standards Committee

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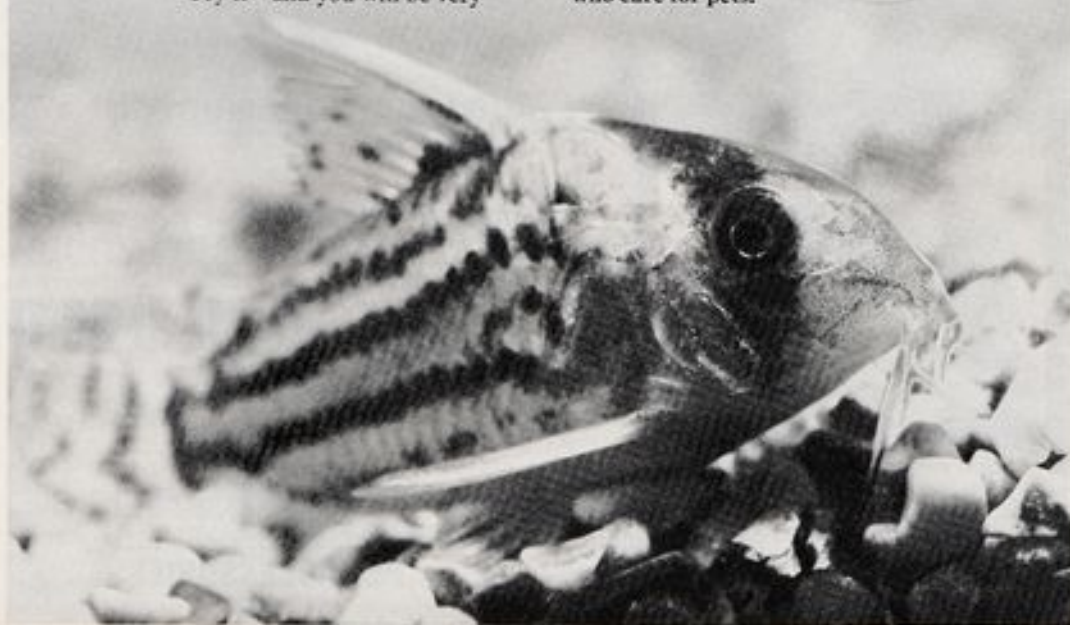
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## Breeding Discus in Kenya



Photo: GENE WOLFSHEIMER

**I**T all started during a visit to Hong Kong just over a year ago, when a friend and I were searching for tropical fish shops. We found one dealer whose 'shop' comprised a rack of tanks placed against a wall beside the pavement! Despite the humble premises, his tanks contained a large number of beautiful discus, with which we immediately fell in love. My friend and I each purchased several fish, which the old Chinaman packed for us with loving care. He actually seemed sorry to be parting with them!

We stopped off in Bombay on our return flight for 2 days, where a good friend of mine, Mr S. R. Sane, who is an exporter of tropical fish as well as a keen breeder, very kindly came along to our hotel and reoxygenated the fish (despite the fact that there was heavy rioting going on at the time!).

Eventually, the fish arrived home in Kenya in very good condition, even though they had been in the

By G. L. ATCHISON

polythene bags for about 4 days all told. They were then installed in a tank in the lounge, where they soon settled down.

Months went by, with the fish feeding well on small garden worms and grated beef heart, with an occasional meal of daphnia when these were available. It then appeared that two of the discus were showing signs of pairing off, by nudging each other gently, keeping close to each other all the time and chasing off any other fish which attempted to approach them.



One evening, when looking into the tank, I discovered that the fish in question were tending a few eggs which had been deposited on a plant leaf. I realised that these eggs stood no chance of survival owing to the presence of other fish in the tank. Sure enough, by next morning there was no trace of any of the eggs.

I therefore decided to give the pair a better chance of breeding, so I transferred them into a tank of their own in my small fish house. The tank in question was a home-made one—all glass—measuring 36 in. by 13 in. by 13 in. The tank was completely bare, with the exception of a stone vase that had also been purchased in Hong Kong, this being the favourite spawning site used by the Chinese breeders there. It also appears to be a favourite with the discus, too!

### Soft Acid Water

The water in the tank was very soft and acid, the hardness being 0.5 to 1 DH and the pH value being in the region of 5.6-5.8. The temperature was maintained at 84°F (29°C). The tap water in Nairobi is very soft as shown above. The acidity of the tank water was achieved by boiling several handfuls of peat for a few minutes and then putting the mixture into a plastic dustbin, topping up with tap water. When the peat has been soaking for a week or so, the water attains a beautiful amber tint and is crystal clear. I keep three of these containers going continuously, so that there is always a plentiful supply of this type of water available. A power filter was fitted to the breeding tank.

The discus were liberally fed on the same diet as previously mentioned and any uneaten food and debris were siphoned off the bottom of the tank fairly regularly, together with about 5 gallons of the water. This water was replaced by water from the aforementioned containers. According to all the literature that I have read on the subject, discus like frequent water changes, provided that the hardness and acidity are the same. They are said to be very sensitive to pH change, more so than hardness change.

After a few weeks in their new environment, the pair began their courtship ritual once more. This consisted of tail lashing, quivering of the whole body, nudging each other and charging each other from opposite ends of the tank, with their heads raised at an angle of about 30 degrees to the horizontal. As they approach each other during this charge, they swerve at the last moment and bow as they pass. It all looks extremely polite!

After about a day of this courtship, the female, helped by the male occasionally, began to clean the vase. This cleaning process is very meticulous, lasting for about 2 days. During this period, both the male's breeding tube and the female's ovipositor began to show slightly. On the morning of the third day, the female's ovipositor became very prominent, protruding by almost 1 in. That of the male is not quite so blunt as the female's.

The pot-cleaning process continued until about 3 o'clock on the afternoon of the third day, when the female began to make dummy runs up the side of the vase, interspersing these with more cleaning. Finally, after about half an hour of this, eggs began to be laid in rows. After each row was laid, the male, who had been hovering nearby, moved in to fertilise the eggs.

The spawning continued for an hour or more, one

fish alternating with the other in moving up the side of the vase, laying and fertilising in turn, until finally there was a patch of about 250 eggs on the side. The eggs are each rather smaller than a pin-head and are amber to reddish in colour.

The male and female both began to fan the eggs with their pectoral fins, but by the following day the female appeared to have lost much of her interest, probably thinking that she had done enough by putting the eggs there! She returned only occasionally to tend the eggs, during which time the male snatched a little time off himself to have some food.

During the next 3 days quite a number of the eggs turned opaque, obviously being infertile. Some of these were removed by the parents. On the evening of the third day the eggs began to hatch. The fry were very minute, showing as a tiny quivering black dot with a transparent body and tail. The male continued to fan the fry.

It was at this stage that I had to go away again on a trip which would keep me away from home for about 10 days. The care of the fish during these frequent excursions of mine is left to my wife. On my return, I was greeted with the news that there were some young discus swimming around in the tank. I wasted no time in going to see them and, sure enough, there were about 20 youngsters feeding from their parents' sides. The first food of young discus is a secretion on the sides of the parents. This precludes the use of the artificial hatching method, as the fry will not survive without this 'mother's milk'.

As with the care of the eggs the male bore the brunt of feeding the youngsters, for the female would put up with it for a little while, then give a quick flick of her body and dash off, leaving the babies behind. When this occurred, the young fish lost no time in darting over to Dad's sides.

The fry had been free-swimming for about 8 days, so I began to introduce mixed feedings in the form of newly hatched brine shrimp. The young fish took to these readily, but would only swim away from the sides of the parent for a distance of 2 or 3 inches and then dart back again. This distance increases as the days pass.

The rate of growth of the fry is extremely fast in the initial stages. After about a week, the body begins to thicken up, becoming club-shaped at first, then, at about 3 weeks or so, the babies look just what they are—discus in miniature.

### Guilty Mum

During this growing stage of this particular spawning, the numbers began to dwindle alarmingly and the chief suspect was Mum. This suspicion was confirmed one morning when I saw her spit out one of the youngsters—dead. I therefore removed the survivors, ten in all, and transferred them to another tank. This was not the end of the troubles, however, as the water in this tank suddenly went foul and killed off more.

Because of these calamities, there are now only three survivors out of that first hatching, but a subsequent spawning has produced just over 50 youngsters, during which time Mum behaved herself, even though, as before, she left most of the work to Dad. This latest brood is now about 2 months old and the young fish are all distributed throughout various tanks, the last

20 or so having been removed 2 days ago. The parents are already going through the motions of the prelude to another spawning!

**Footnote.** The Chinese method of sexing discus is by examining the head. They say that the female is broader

across the forehead just forward of the dorsal fin, when viewed from the front, than the male is. My particular pair supports this theory, as the male's forehead has a definite ridge and the female's has quite a broad curve over the top.

## Salamanders in the Aquarium

By J. LEE

I SAW my first salamanders in a pet shop in an aquarium near the tropical fish. I liked them at first sight and decided that I must have some of them. There were about 15, all adults, to choose from and of these I picked out eight, three of which were very fat and which I assumed to be females.

I used a large 4 ft. by 18 in. by 18 in. tank for my vivarium, placed about 3 ft. opposite a window so that they could get a fair amount of light. Large Westmoreland rocks, boiled and scrubbed, were placed round the back and at one end of the tank so that there were plenty of caves and hiding places for the animals. This is very important. Salamanders will crawl into these crevices to hide, but it is essential that they do not all huddle in one cave, as this causes a fungus-type of skin infection that appears as light patches beneath the skin. So, however large the tank is, the creatures must not be overcrowded—six to a 3 ft. tank is quite sufficient. A good supply of fresh, clean moss or willow plant should be provided for their home. I have found, over the years, that salamanders can thrive in a wide range of temperatures, from 60° to 80°F (15-26°C), but a temperature in the seventies is best. They are harmless creatures and in my experience do not bite.

The species of salamander with which I am most familiar is the European spotted or black-and-yellow one (*Salamandrina atra*). This species attains a length of 8-9 in. and have lovely, sleek glossy black skins. They must be provided with moist conditions as, if their skins dried out, they would die. There is an old story that if a salamander loses a foot or tail it will grow another foot or tail intact though I have never witnessed this.

When my salamanders bred I used a 3 ft. by 12 in. by 12 in. tank arranged so that about three-quarters of the bottom was the 'land' area and the remainder had about 1 in. depth of water, set up with plenty of clean rocks, sterilised moss and Pontinus and a few bunches of willow roots. Firstly, I put down the 4 in. layer of compost (soil, leaf-mould and peat moss) and, at one end that was to be the junction of 'land' and water, I arranged a layer of small, smooth, flat rocks. Over the rest of the tank base I put a ½ in. layer of well-washed silver sand.

37



Photo

Spotted black and yellow salamanders

B. KAHN

Only about an inch of water is required above the base, but this is essential because the birth takes place in the water. When the female is ready to breed, she lowers her hind end in the water, gives a sort of shaking motion and then the baby salamanders are born, fully developed with legs, tails and gills. Incidentally, an interesting fact about this species is that gravid females can hold the sperm received from the male up to about 3 years so that from one mating they are capable of producing up to 30 or 40 young.

I always sowed a small culture of white worms in the soil compost and kept the worms fed in the usual way. Young salamanders stay in the water in the tadpole stage for 5-6 months until their metamorphosis takes place, and when they leave the water they can feed on the white worms. Other foods for them in the tadpole stage are *Daphnia*, *Cyclops*, *Tubifex*, ghost larvae and tiny earthworms. When they leave the water for the 'dry land' they are quite small and soon show their true salamander colour markings. Subsequently the growing and adult salamanders will thrive on earthworms.

This species makes very affectionate pets. If they are hand-fed they can be trained to come to you at feeding time.



## Transatlantic TOPICS



By JIM KELLY

needs no edible fungus to enlighten him. As founder of the American Betta Congress he is probably one of the world's foremost authorities on fighters.

On breeding for colour he has this to say: 'Red and green appear to be the most powerful colours in bettas as we aquarists know them. Red spawned with red will produce red. Both parents green, result—green. However, if the Cambodian strain is crossed, manifestation is so subjugated as to have it disappear in the resultant fry.

'The colour blue is subject, almost, to the same limitations. If dark blue (cornflower) bettas are bred the fry are divided between green, steel-blue and cornflower. Steel-blue or green, if crossed to its own colour, result in that colour, but cross steel-blue with green as a full sib and you will breed beautiful cornflower blue fish.'

Walt also warns breeders that the difference between the water temperature in the aquarium and that of the air immediately above it is critical and repeats the advice to cover the breeding tank with a glass cover. Avoid draughts of cold air blowing across the aquarium; these he has observed will destroy even the best-built of bubble nests.



Having trouble in sexing your *Pseudotropheus auratus*? Or perhaps your tanks and taste don't run to the Lake Malawi cichlids. But if they do then you will be interested in the buzz going the rounds in the States that the female of this cichlid is gold (the colour now accepted for immature fish), and has the lower lobe of the caudal fin coloured either yellow or white. She is also lacking in dark markings. Incidentally, Dr Goldstein has just reported that he has a successful spawning in his tanks of a cross between *P. zebra* and *P. tropheus*.

In a poll taken by the Florida Fish Farmer's Association, amongst whose ranks are 80% of all the fish farmers in the Sunshine State, figures revealed that at least three-quarters of all the tropicals shipped out from this part of the world were raised there. One farm alone produces some 18 million fishes for the world's markets each year.



Historically speaking, the first province of the American 'Middle Kingdom' over which we British and the French fought for possession, was Ohio, the State that makes the natural transition from the Allegheny highlands to the great prairies.

In the fishkeeping world it has been on the map for a long time, ever since that doyen, Hugo Mulertt, wrote his first book, THE GOLDFISH AND ITS CULTURE, in Cincinnati. That the interest hasn't diminished was borne out by a recent announcement from the Dayton Central Library. They had just discovered that every book they had in the place connected with the hobby was out on loan... Dayton had gone mad on tropical fish!

If that doesn't constitute a record then I know one that will—the editor of the 'Dayton Guppy Gazette' is Ron Bergman, topping 7 feet in height; having had the pleasure of meeting Ron, I know he is as 'tall' in the hobby as John Wayne is in the saddle.



In answer to many inquirers here are the two addresses you asked for in the States: The American Cichlid Association, Guy Jordan, 6546 Celia Vista Drive, San Diego, California 92115. Publishes a bulletin called 'Buntbarsch', devoted to cichlids. (If that word Buntbarsch had you confused it simply means 'coloured perch'.)

United Marine Aquarists, Box 537, Baldwin Park, California 91706. Their magazine 'Sea Life', though an amateur effort, is full of professional advice for the marine enthusiast.

AN article in Buntbarsch Bulletin of the American Cichlid Association, by James K. Langhammer of Detroit Zoo gives details of a recent announcement that the name for the dwarf cichlid *Pelmatochromis kribensis* is a 'junior synonym' for *Pelmatochromis taeniatus*. If that remark has you puzzled, please read on.

In 1901 George Boulenger, an ichthyologist, gave the world a new fish he had discovered in the Niger River Delta in Africa. He christened it *Pelmatochromis taeniatus*. Ten years later, now working on the Kribi River in the Southern Cameroons, he came across a similar fish which he dubbed *Pelmatochromis kribensis*. Now Dr Thys is stating that both these fishes were one and the same and according to the priority of publication rule in zoological nomenclature, the first published name takes precedence. Out, he says, should go the familiar *kribensis*.

That seems fair enough, but to further complicate the issue, our modern researcher also claims that the fish appearing in almost every aquatic publication as *P. kribensis* isn't—it is in fact *P. pulcher*!

It all rather reminds me of a card Dave Stimson gave me in Indianapolis, that now hangs over my desk: 'Those who remain calm in the midst of all this confusion really don't understand the situation'.



Lewis Carroll had his Alice (whose name means truth), nibbling at a magic mushroom to alter her size and teach her the relativity of all things. When it comes to the fighting fish (*Betta splendens*), Walt Maurus

# Custom-built Lounge Aquarium

By DAVID REYNOLDS

AFTER having kept tropical fish for the last 6 years, I had built up a very good collection of fishes and tanks and had gained quite a lot of experience. I had 10 different sized aquaria built into one unit of which I was quite proud. But I experienced the usual snags that occur, such as rusting, seeping of condensation water under the cover glass and difficulty of maintenance because the aquarium hood was in the way, and so on.

Three years ago we decided to move home, which meant selling all my fishes and tanks as these would not fit in with the decor in our new home. Having read *PETFISH MONTHLY* from the first issue I had been very impressed by and interested in the Monaco-type aquaria that Dr F. N. Ghadially described in an early article in *PFM* (January, 1967.) The house I was about to move into was still being built, and I thought this was a real challenge to adapt the idea.

The first thing that had to be decided was where to position such a tank. After much thought and

discussion I finally decided to incorporate it alongside the fireplace, with a natural stone exterior, as both could be built together. The aquarium is 7 ft. 6 in. long between the extreme back points, tapering to a front viewing size of 5 ft. by 2 ft., and is 2 ft. wide in the main part. The tank frame was constructed of 1½ in. by 2½ in. by ½ in. angle iron and glazed similarly to Dr Ghadially's aquarium apart from the bottom, where I used ½ in. plate glass.

After the glazing was completed and time had been allowed for the putty to harden off, I was ready to position the tank. The floor on which the tank was going to rest was floor-boarded with six joists running directly under the tank into the wall behind. This, I decided, was adequate to support the vast weight of water the tank would hold. The tank was raised 12 in. from this floor

by wooden planks laid under the tank bottom. This enabled the tank to be viewed perfectly from a sitting position, as this is what we required in our living room (unlike the tank that Dr Ghadially set up which was in his hall and was viewed from a standing position).

The overall height of the aquarium was made level with the mantel shelf and this was made to appear continuous with a matching wooden top built over the tank. This top was made hinged so that it lifts back to the wall. It was made of a wooden frame 1½ in. by 2½ in. on which ½ in. panel tone wood was fixed. This gave a 1½ in. cavity inside the lid that was sufficient to allow four ½ ft., 30 watt Grolux fluorescent tubes to be installed without making the lid and mantel look too heavy. The inside of the lid was lined with 20 wg aluminium, which served both to reflect the light and to stop any damp from warping the wood.

The extreme end of the aquarium front wall away from the chimney breast I decided to curve round to the back wall, and two alcoves were built into the curve. In one of these a trailing plant was placed and in the other I housed the control panel. I installed five switches in the panel, two of which controlled the lights, one controlled the power filter that works on an electric time-switch, one was for the heaters (for safety reasons when work has to be done in the water) and one was for the air pump that operates seven air stones. All the apparatus was placed in the spaces behind the wall at the front ends of the tank.

The front of the tank was inset 4 in., the thickness of the stone wall, and a polished teak frame was built round the edges of the front glass. A metal support was hooked over the top front angle-iron, bent down and brought out the depth of the stone. This runs the full length of the tank and gives good support for the top course of stone.



Frame of the aquarium before glazing. In this Monaco-type aquarium because of the angled ends it is not possible to see the tank corners from the front (nearest camera) when it holds water





The top of the tank frame was divided into three sections by two 10 wg stainless steel tie-bars fitted across it. I used stainless steel as I knew from previous experience that such ties rotted rapidly if made in mild steel. The under-edges of the surrounding frame were given a coat of silicone sealant (such as is used for glazing aquaria without frames) to stop rusting, and this has proved most effective. For the three top apertures I made 16 wg stainless steel frames to fit in them snugly. These frames had their top edges turned out and dropped down 1 in., with a  $\frac{1}{4}$  in. edging turned back. These made excellent well sections into which the cover glasses were to be placed, thus stopping condensation seeping over the top angle or reaching the strip tubes above through any gaps. The frames were then sealed in with silicone and screwed to the tank. With the cover glasses in place I now had a completely sealed top.

To facilitate lifting the cover glasses in and out I made  $1\frac{1}{2}$  in. finger holes in the centre of each glass. I chose the  $1\frac{1}{2}$  in. size as this fitted round plastic plugs of the type used for sliding-door handles, which could be used to cover the holes when they were not in use. The holes were also ideal for feeding purposes. By sliding a short length of 1 in. diameter stainless steel tube, having a small flange at the top and

Left: view of installed aquarium and fireplace from right-hand end. Right: curving wall has two alcoves housing a plant and the tank's panel of switches (note the raised aquarium top)

Below: end view of tank from above (top raised) showing feeder lying on the cover glass and power filter nearest camera. Seven valves on the nearer cross-tie are airstone controls



Photographs  
by the  
author

with the blanked-off bottom perforated with small holes, into a hole cut through the centre of one of the plastic discs, one had an ideal tubifex feeder, which could be

used without removing the cover glass and could be taken out for cleaning.

On to the top of one of the stainless steel tie bars a seven-ganged

airstone control valve was fitted. The seven tubes to the airstones run down underneath the tie bar and through a tube set in the blocks of concrete that I chose to use for a background (see Dr Ghadially's impressive article on pp. 289-300 in March 1967 of *PFM*).

To heat the aquarium, I fitted four 200 watt heaters with outside fitting thermostats. This has proved perfectly adequate for heating the 130 gallons (approximately) of water.

The aquarium has now been set up since July 1969 and has a most pleasing effect. In fact, quite a few people have been enticed into the hobby since seeing it. I have found no snags at all in the set-up as everything is so accessible and a pleasure to maintain. When I am working on the tank the lid is leaning against the back wall neatly out of the way, but it still gives plenty of light to illuminate the 2 ft. of water.

For a tank of this depth the standard equipment that can be purchased, such as nets, planting sticks, front glass cleaners etc., is of little use unless the handles are extended. To do this I cut the tops off and welded 3 ft. lengths of 1 in. stainless steel rods, having one end bent into a circle, on to the existing frames.

I have not included details such as the making-up of the concrete background inset with slates, the

## Aqua-tip

FINDING many of the popular live foods hard to obtain in the winter months I decided this winter to keep and breed wingless fruit flies (*Drosophila melanogaster*). These are easily bred in covered jars kept in the fish house and cultures of the flies are readily obtainable as they are widely used for school biology classes.

Food for the flies is prepared as a liquid and then allowed to set in a slightly sloping layer about 1 in. deep at the bottom of the jars before the flies are put in them to start the culture system off.

Ingredients: 2 oz. of oatmeal, fine or medium; 1 oz. of black treacle; 1 small teaspoonful of agar (from a chemist); 1 pint of cold water. Soak the oatmeal in about a cupful of the water and stir well. Allow it to stand for a few minutes. During this time bring a half pint of the water to the boil and when boiling stir in the agar. When it is thoroughly mixed add the oatmeal and treacle, slowly, and be sure to keep the mixture thoroughly stirred. Add more of the water if the medium becomes too thick. Place it in the jars whilst hot and allow it to set.

A piece of absorbent paper is included in the jar as a loose roll standing on the surface of the food layer, for the flies to walk on and to keep the food layer moisture-free. When a jar is harvested it is only necessary to tip it upside down over the aquarium. Fish very soon deal with the small flies reaching the water surface.

R. MERCER

glazing of the frame etc. and the advantages given by the Monaco type tank of not seeing the ends of the aquarium, as these points were fully covered by Dr Ghadially in his articles in *PFM* for January, February and March, 1967. But I

hope this article is helpful to anyone wishing to build such an aquarium. It is a long and painstaking job but has very rewarding results.

The issues of *PFM* containing the articles referred to above are unfortunately out of print.—EDITOR.

## What's New?

### Serve Yourself Feeder

NEXT time you pass a garden pond and see a crowd of goldfish apparently playing 'head ball' with a water lily—do not be too surprised. The fish will undoubtedly be crowding round the new **Goby Pond Automatic Fish Feeder**.

This perforated food container, 4 in. high, floats partly submerged under its own plastic water lily that is attached to the removable screw-on cap. A plastic-covered weight attached to the bottom of the container by a short plastic chain enables the fish to shake out the food through the perforations. The body of the feeder contains a float that keeps it at the surface and the food is continually pushed out of the holes by the action of a marble roller inside. Pond owners will have the pleasure of seeing more of their fish kept busy in this way at the surface.

A small, 1½ in. version, without the flower decoration, has been adapted for the aquarium where the fish can also learn that by moving the suspended weight they will be rewarded with food. Suppliers are Integrity M.O. (prices are 14s for the pond type and 7s for the aquarium type).

### Micro Food

ALTHOUGH not new to aquarists the micro eels (*Tarbatix aceti*) now being made available by **Temol Products** are in cultures with the advantage that the worms can be added to the aquarium as food for small fishes direct from the liquid culture medium. The worms, which swim with undulating movements, are tolerant of being left in their culture without attention for at least a month and their growth gives rise to a rather mild ciderlike smell in contrast to the pungent odour arising from micro worm cultures. Micro eels are, in fact, between micro worms and Gindal worms in the scale of 'micro live food' sizes and have been used in the U.S.A. for many years. Price of a culture with instructions is 7s 6d.

## WATER PLANTS OF SOUTH AMERICA

## Plants of Guyana

AS a last stage in our water-plant study expedition through South America, we made a short visit to one of the most northerly areas of the continent—Guyana, until a short time ago a British possession and now independent. In the literature some very interesting water plants are recorded in this area, among which are sword plants (*Echinodorus*). However, in the coastal areas near the capital, Georgetown, we could find no *Echinodorus*, and considering the natural characteristics of the area their existence must be regarded as rather unlikely. Two special characteristics are a feature of large sections of this area, namely savannah with the flooded rain forest that sometimes borders it and, secondly, the numerous ditches of the sugar-plantation area.

The savannah is a far-stretching, open reed and grass land, which is interrupted only by isolated trees, copses and shrubs or brushwood. Numerous rivers and their tributaries cross the area and provide the necessary drainage. At times of heavy rainfall, extensive parts of the savannah are covered with water and if one travels over the open watercourses by boat the impression is given of an extensive marsh landscape with thickly matted plant-cover of water grasses, rushes and reeds. An eerie silence hangs over everything, broken from time to time only by the cawing of the parrots that perch in flocks in the tops of the solitary-standing trees and fly off in fright at the approach of a boat.

Quite near the large international airport of Georgetown, Atkinson Airfield, lies the mooring place for ships on the great Demerara river, from which ships depart for Mackenzie City. Here can be hired a small boat,

By Dr JOACHIM SCHULZE

Photographs by the author

Translation by F. MARSH

with one or two natives as crew, to reach the typical savannah lands via tributaries of the Demerara such as the Kamuni and Waratilla rivers. Often these rivers cut through thick, flooded rain forest. An unending thick growth of trunks towers out of the water and makes progress of even a few yards into the jungle an exhausting undertaking. Large growth of *Montrichardia arborescens*, and also mangrove species, border the banks.

These tributaries near the estuary of the Demerara are quite powerful and carry a great deal of water in the rainy season; the movement of the water is so strong that the middle and upper reaches of the rivers are narrow and the Kamuni river, for instance, 15 miles from the mouth (about a hours journey) is only 5 to 8 yards wide, and in the forest areas the jungle is already closing in thickly over the river bed.

We only found water plants in the open savannah areas and then only in isolated clumps near the banks. We are dealing here with a blackwater area, such as was described in the February issue of 1951. From our



A characteristic plant of the blackwater areas of South America is *Tonina fluviatilis*. It is unusual in showing similar leaf formations when growing submerged or emergent. A beautiful plant with a possible future in aquaria

*Spotyphyllum* species, first brought to Europe as an aquarium novelty a few years ago from Colombia. This plant was also found in Guyana



previous experience of such an area we expected a very scanty growth of water plants. However, we did find a few typical blackwater plants. *Tossia fluitans* is found everywhere in the blackwater areas of South America, and does extend into the clear water areas; it is one of the very few species suited to the unfavourable living conditions of black water, which is extremely low in nutriment and has a high concentration of humic acid and other organic matter. This plant, which adapts well to amphibious life, is noteworthy in that its leaves are structurally the same in both their submerged and emerged forms (usually, because of the altered conditions, there is a considerable difference in the two forms of leaf structure). It would be very interesting to try to culture this beautiful plant and attempt to acclimatise it to our aquaria.

*Mayaca* plants, producing floating stems reminiscent of pine twigs with their long needle-shaped foliage, are

also to be found, and these species also apparently tolerate black water quite well. The individual species of this genus are difficult to differentiate because it is not known how many are to be found (four to ten are named). *Mayaca* forms the family of the Mayacaceae and is chiefly found in S. America. Only one species extends into south-east N. America and another occurs in Africa. Emerged *Mayaca* is abundant in S. America, and it then sometimes produces upright long leaves or at times low-lying leaf sprouts that make a thick-set shape that looks something like a huge cushion of lichen. *Mayaca* is another species in which hardly any experience in aquarium cultivation has been gained.

Here again abundant species of *Utricularia* were found, often combined with the two above-mentioned water plants in the same clumps. A variety of *Utricularia* with violet blossoms grows here. Their exceptional appearance makes it difficult to accept that *Utricularia*



Drainage channel in the vicinity of a sugar cane plantation in Guyana, which was overgrown with *Lophocorpus* and *Cabomba*



One of our best-known tropical aquarium plants, *Cabomba aquatica* is shown growing luxuriantly beneath the water surface of a sugar plantation ditch in Guyana.

can be used just as frequently in aquaria as, say, *Cabomba*, *Myriophyllum* or *Elodea*, or other plants with trailing stems, and they certainly have not yet come into use in aquaria. Many tropical *Utricularia* species with their filigree foliage merit attempts to cultivate them for the aquarium and Mr Thomas Horeman informs me that he has been able to cultivate *Utricularia* species for a long time in his hothouses. The genus includes no less than 250 species, among them many very beautiful aquatic ones and, of course, some land-living forms.

There is considerable variation in the water level in this savannah area and in the species mentioned, with free trailing stems, as with *Tossia fluitans*, the leaves are well adapted to these conditions without alteration either emerged or submerged. But the variation in water level is not, of course, so extreme here as in the Amazon or Rio Negro areas.

Here and there we also had an occasional glimpse of tropical rain forest. Only a few species of marsh plants can flourish on the forest floor, which, although crossed by many watercourses, is always deeply shaded and seldom lit by even a ray of sunlight. There are a few species of araceen plants and, to our great surprise, we came across a *Spatyphyllum* that was brought to Europe from Colombia a few years ago and recommended as an aquarium plant.

Another distinctive set of conditions for the growth of water plants in Guyana is to be found in the areas of the immense sugar cane plantations. Similar conditions are found in the sugar cane plantations of northern S. America and those of central America or the West Indian islands. Field crops are usually crossed by narrow paths to facilitate cultivation, but here there are waterways, which have solved the problem of regulating the water supply. Mostly the water is stagnant or slow flowing and receives plenty of light. The water belongs to the clear-water type, almost neutral in reaction, but it has been greatly enriched from the cultivation and manuring of the area. Plant life is correspondingly abundant.

A long ditch furthest away from the actual plantation was completely overgrown with *Lophocarpus guayanensis* (H. B. K.) Smith and *Cabomba aquatica* Aublet. The first species is a near relative of *Sagittaria* and as yet has hardly been utilised aquatically. *Cabomba aquatica* was growing with its yard-long, thickly foliated stems and abundant yellow blossoms so plentiful that the ditch, which was often a yard deep, was filled with them down to the bottom. Although the lowest plant layer hardly received any light even the plants there were in the finest condition, which again hints at the relativity of the importance of the individual factors for growth. *Copsonia arnoldi* and *Pritella riddleyi* were to be found by the million in these waters.

Near Georgetown the ditches of the sugar plantations dividing the plantations from each other and from the roads are so thickly overgrown with so many varieties of water plants that no clear stretches of water can be seen. There is also likely to be a heavy addition of nutriment in the discharge from factories—sugar refineries and distilleries, with a corresponding increase in plant life; this in turn plays a beneficial part in purifying the water. Sometimes this lush growth is felt to be disadvantageous and attempts are made to attack the water weeds with herbicide. Until now, however, the results of these control methods have been inadequate.

In the course of a few yards in such a ditch we were able to identify numerous different water and marsh plants. There were water lily varieties, *Pontederia*, *Eichhornia*, *Caladium*, *Pilea stratiotes*, water mimosa (*Neptunia*), *Salvinia*, *Hydrocoleis symphoides*, many *Jussiaea* species and numerous other plants—a true Eldorado for the water plant enthusiast.

A parallel in this association between agricultural use and the growth of wild water and marsh plants is to be found in the copious water plant vegetation in and near rice fields. By studying the natural characteristics we find, in each case, that the extra nourishment afforded the plants in these areas increases their growth provided that the water is not polluted or contaminated with harmful waste products.



## Personal COMMENT

by  
ARPEE

THERE are many ways of laying disastrous foundations to tropical fishkeeping, and a conversation I recently overheard in a shop typifies the suicidal tendencies of many beginners. In face of the growing bibliography on the subject I can only add that deliberate ignorance perhaps deserves what it gets, though it is often a bit hard on the fish!

The shoppers whose plans I intercepted had decided that they liked the look of some angels, some veiltail guppies and, 'to help keep the water clear', some snails and a catfish. It is more than likely that, before they left the shop, they would have been enmeshed by the charms of the tiger barb, too. The result of this little battle would have been a 4-0 win for the tigers, and the punters would have felt diddled out of their stake money. At this point some readers will know why and some will not, and although it is underlining the obvious to many, I should explain that the angels will nibble the tails of the guppies and the moustaches of the catfish and the tigers will follow suit, but will also eat all the snails and attack the whiskers of the angels.

I am not sure, of course, of the outcome of this little episode. Some readers will probably say that I should have intervened and offered advice, and others will believe that this is all a matter between the purchaser and the shopkeeper. I must admit that when I overhear plans for unwise purchases I feel sorely tempted to butt in and try to be helpful, but I usually resist the temptation unless there is such helplessness surrounding the would-be purchaser that such a course would be out of the question.

I wonder whether enough dealers make an attempt to sell real beginners a book rather than apparatus and livestock when it is clear that they have no idea of what the hobby is all about: I like to think that there is, on the whole, a responsible attitude in this respect—the economics of the situation would indicate that it is in the best long-term interests of both parties for a realistic attitude to be taken at the outset, as a hasty sale may often mean a hasty exit from the hobby of a potential stayer.

Good advice is particularly vital where young people are concerned, and those still at school need particular attention. It is certainly difficult for a dealer to advise twenty or so enthusiastic youngsters on a Saturday morning with a shopful of customers, but many a headmaster would welcome a hobbier talk from an expert during school hours, and I wonder how many members of the trade take the initiative in this respect? I have not had any letters from readers under 18 years of age and if any of them have views about all this, I should be very pleased to hear from them.

In days when the contents of aquaria were less exotic than they now are, the sight of a red *Planorbis* snail making its leisurely way was a certain attraction to any passer-by. I remember well how we used to breed them and take the utmost care of them, but we little realised how far from grace snails would fall over the years. Their supposed value stemmed from the proposition that only a 'balanced' aquarium could possibly succeed. This means that every tank had to be an exact snapshot of a like volume of water in Nature; in the course of time we have come to realise that this is all nonsense, as in fact we can pick and choose what we want, and the only limitations are those imposed by some form of basic incompatibility. We would no sooner think of putting water scorpions and *Dytiscus* beetles in with the goldfish than of associating sticklebacks with neons.

The myth that snails are a good thing possibly started with the sight of a group of them disposing of a dead fish or some redundant dried food. It is perfectly true that snails will eat almost anything, but when you consider that this includes the mature as well as the tender tips of plants, their real value is seen to equate to that of the slug in the garden. I have never been very happy about the concept of a 'scavenger' in the aquarium, be it coldwater or tropical, but the idea dies very hard. If the aquarist is worried about uneaten food or the dead fish, the answer is to feed more thoughtfully and to remove casualties as soon as they are noticed—the nose is particularly helpful in locating the latter!

If there are readers who still are undecided about snails, I would suggest that they look at two things. Go to any lily pond in which there are snails, and turn back some of the floating leaves. There are normally several batches of jelly-like snails eggs on each leaf. Most of these hatch, and there may be 50-100 young from each batch. Multiply this by as many leaves as you can count, and you can quickly see what a horrifying imbalance can result. On one leaf in my pond last season I destroyed over 20 groups of eggs: I now know why my most promising plantation of water hawthorn suddenly disappeared. The other example I would quote for examination is the degeneration of the leaves of cryptocorynes with bullate (crinkled) leaves. An apparently healthy plant will often fail because the leaves suddenly become perforated (rather like a Madagascar lace plant). The presence of dozens of small snails, all of which have been rasping away for weeks, gives a nasty shock, as well as being quite a revelation of just what they can do. It is one thing to acknowledge the danger and quite another thing to remove the cause of it.

For coldwater installations the best thing seems to be to attack at source and remove every egg and snail that you can see. As both are fairly accessible the job is difficult only in its duration, but ruthlessness is the keyword. In tropical tanks it is rather more tricky to eliminate snails. For one thing they are usually of smaller species, and they remain unnoticed until much damage has been done, and for another, their eggs are much more difficult to locate and dispose of. You can try floating lettuce leaves in the tank overnight and removing the attached snails on the morrow, but there always seem to be some which evade these measures. Short of introducing chemicals or predatory fish, neither of which may be compatible with the other inmates, the only long-term solution is to undertake a snail-hunt every day until nose can be seen, and then still to go on looking!

The majority of snails seem to come into evidence as the evening wears on, and I usually begin a liquidation session at about 9 p.m. I use a stout piece of flat wood about 9 in. long to crush against the glass any snails which I cannot reach with my fingers. Those which you can see but which cannot readily be got at can often be dislodged with one of those wooden back-scratchers which can be so easily and cheaply bought at the book-sellers nowadays. The hand-like terminations of these comforting instruments curve upwards slightly, and you will find them ideal for inserting beneath a snail, which you then gently dislodge. With a little practice you will find that it drops right on to them, and you can lift the mollusc clear of the water, to its final extinction just as easily as, with the same instrument, you can satisfy your itchy back. It may be as well to acknowledge the Duke of Argyll in both cases, but it is not obligatory in the case of snail removal.



Correspondents are thanked for their comments on the possible ill-effects on discus of noxious mixtures like lemonade. One word of warning, though. It should not be assumed from Mr Riley's letter that you can treat them to a pint of bitter with impunity, even though he states that he now introduces to their quarters only materials of aquatic origin. Despite our feelings about the specific gravity of what we get from across the bar counter we must avoid at all costs statements which are likely to attract retaliation from Britain's brewers. Mr Treng points to cyclamates as likely catalysts in this whole sorry affair and so leads us on to the wider matter of Nature v. man-made poisons.

There has been a great deal of public comment recently over the outlawing of DDT because it is said to be a persistent poison and easily transferable from victim to predator and in turn to super-predator. An article I read recently in THE NEW SCIENTIST gave a most interesting account of the quantities of DDT which had built up in brine shrimp taken from the areas of the Utah Great Salt Lake on the one hand and of San Francisco on the other. Natural drainage into both areas had caused amounts of DDT from human sources to become integrated into the lives of the local shrimp; and it was found that three times as much of the substance was present in those coming from the Great Salt Lake as in those from San Francisco.

It is unlikely that there is any need for aquarists to throw away all their Utah brine shrimp eggs, because it was found that shrimp from this area which were fed to a variety of other creatures had an asymmetric effect on them: some died and some did not, but there was just enough evidence to make one a bit uneasy. It may well be worth carrying out some experiments with this in mind when breeding angels and the dwarf cichlids, whose fry find brine shrimp so vital during their first free-swimming days.

It does underline the need for the utmost care in the use of insecticides where hobbies like fishkeeping are concerned and I repeat my almost seasonal warning, with warmer days in prospect, that aerosols within a mile of a fish tank should be regarded as lethal, and that garden sprays should be kept at about the same distance from your pool if you wish for complete safety! To be practical, swat your flies and use the bodies as fish food. If your fish then die because the flies fed off a dead bird which had been poisoned by greenfly full of malathion you will begin to understand what a curious world we live in.

## Meetings and Changes of Officers

**BRENT A.S.** Meetings: Every Tuesday at Anson Hall, Anson Road, Cricklewood, London, N.W.2, 7.30-10.30 p.m.  
**BRENTWOOD A.S.** Meetings: at St Thomas' Hall, Essexfield Road, Brentwood. For details please contact secretary Mrs M. Taylor (15 Tollesbury Court, Woodlands Avenue, Hamon, Brentwood).  
**BRIGHTON & SOUTHERN A.S.** Chairman, Mr A. Dimes; secretary, Mr B. Shelton; treasurer, Mr D. McFarlane; P.R.O., Mr D. Crust (12A, Springfield Road, Brighton, BN1 6DA, Sussex).  
**CAMBRIDGE & D. A.S.** Chairman, Mr Yates; vice-chairman, Mr Starton; secy., secretary, Mrs P. Pope (Colindale, Hythe Lane, Harwell, Oxon.); assistant, Mr Pope; treasurer, Mr Freeman; show secretary, Mr L. Georgeson (16 Leys Road, Cambridge; phone 38953). Meetings: First Tuesday in the month at the Working Men's Club, Fitzroy Street, Cambridge. Visitors are always welcome.  
**ELLESMERE PORT T.F.S.** Chairman, Mr K. Tomlinson; secretary, Mr F. Dean (109 Overpool Road, Ellesmere Port); treasurer, Mr F. Skidling; show secretary, Mr P. Stephenson; Librarian, Mr M. Fay; P.R.O., Mr J. Rowley.  
**F.G.B.S. EAST MIDLAND Section.** Chairman, Mr H. Esterbrook; secretary, Mr J. W. Carter (5 Sanderson Road, Leicester); treasurer, Mr W. Prince; show secretary, Mr A. Baker. Meetings: Last Thursday of month at St Paul's Rooms, Kirby Road, Leicester.  
**FREELANCE A.S.** Chairman, Mr A. Howe; secretary, Mr J. Arkland (148

Mayswood Road, Grove Park, London S.E.12); treasurer, Mrs E. Kenyon; show secretary, Mr W. Bishop.  
**GUEST, KEEN & NETTLEFOLD P. & A.S.** Meetings: Fourth Tuesday of month in the Waverley Restaurant. Visitors welcome.  
**HARROGATE & D. A.S.** Meetings: Second Tuesday of the month at the Conservative Rooms, 15 Park View, Harrogate. New members welcome. Please contact secretary Mr A. P. Southard, 5 Regent Avenue, Harrogate.  
**HAVANT A.S. New Society.** Chairman, Mr H. Armitage; treasurer, Mr R. Davies; secretary, Mr J. Barker (110 Hart Plain Avenue, Cowplain, Havant.); show secretary, Mr P. Sparsbott. Meetings: Every second and fourth Thursday of month at Prince of Wales Public House, Bedhampton at 8.0 p.m. New members very welcome.  
**HOLYHEAD & D. A.S. New Society.** Chairman, Mr Ian Farlow; vice-chairman, Mr Dick Barnell; secretary, Mrs Brenda Farlow (12 Trafalgar Road, Caerpoilog, Holyhead, Anglesey, N. Wales); treasurer, Mrs Paul Evans. Please contact secretary for information.  
**HYDE A.S.** Secretary, Mr B. Riley (11), Emery Park Road, Glossop. Meetings: Every other Wednesday, White Hart Hotel, Flowering Field, Hyde, Cheshire.  
**INDEPENDENT A.S.** President, Mr F. Tomkins; chairman, Mr S. Applin; secretary, Mr M. Harth (16 Liverpool Road, London, N.1, phone 216-4531); assistant show secretary, Mr T. Beaumont; treasurer, Mr J. Kande; P.R.O., Mrs I. Applin, Mr B. Mason; librarian, Mr S. Beaumont. Meet-

ings: Every Monday at the Holloway Institute, Edna Green, Holloway, London, N.7 at 8.0 p.m. New members very welcome.  
**LINCOLN & D. A.S.** Meetings: Third Monday of each month at the Liberal Club, St Swinburn Square, Lincoln, at 7.30 p.m.  
**LOVNE A.S.** President, Mrs R. Standish; vice-president, Mr E. Smart; Mr S. Jones; chairman, Mr S. Jones; vice-chairman, Mr S. Tenness; secretary, Mr R. Holmes (9 Kempton Road, Leicester); treasurer, Mr J. Sells; P.R.O., Mr J. Hambling.  
**MIDLAND AQUARIUM & POOL SOCIETY.** Chairman, Mr S. Goss; treasurer, Mr A. M. Thompson; secretary, Mr C. W. Davies (8 Redhill Road, West Heath, Birmingham 31, phone 021-472 1780); librarian, Mr M. Harvey; editor, Mrs M. J. Wims.  
**MID-MERTS A.S.** President and vice-chairman, Mr Tom Tinson; chairman, Mr Peter Bird; secretary, Mr Clive Willford (37 Ase Close, Marsh Farm Estate, Langrave, Luton, Beds.); assistant, Mr Don Lander; treasurer, Mr Colin Johnson; show secretary and P.R.O., Mr Charlie Withers (13 Chesham Road, St. Albans, Herts.); phone 58346; assistant, Mr Laurie Waller; secretaries, Mr C. Lane.  
**PORTSMOUTH A.S.** Chairman, Mr Jack Stillwell; secretary, Mr T. J. Howard (15A Palmerston Road, Southsea, Hants.); P.R.O., Mr L. Taylor (16 Kestrel Drive, Bolton, Bradford 2, Yorks.); phone Bradford 53747.  
**ROMFORD & BEACONTRÉE A.S.** Secretary, Mr R. C. Smith (125A Longbridge Road, Barking, Essex).  
**YATE & D. A.S.** Meetings: First Monday of the month at The Horse Show Inn, Downend, Bristol at 7.45 p.m.



# GUPPY

## World

A GREAT deal about modern life can be expressed in numbers. Even life and death can be reduced to figures in some actuary table. The hobby is full of figures we should know about. Those of us who, when asked the question: 'How long before my female guppy gives birth to young after fertilisation?', answer 'about a month' with a shrug that indicates such figures are child's play, may be interested in the following.

One scientific paper has said about the gestation period of the guppy that it is 28 days at an average temperature of 78°F (25.5°C), 38 days at 69°F (20.5°C) and only 19 days when the mercury rose to 90°F (32°C). Though more mutations occurred at these high temperatures, their use was not recommended. At the best they shortened the life of the female, at the worst caused her death.

The scientists also found that pregnant females seemed uncomfortable when left alone in a breeding tank. Better broods were recorded when they shared their confinement with another female, though the chances of cannibalism were, of course, increased. Best compromise was to house the adults in an aquarium thick with plant cover, giving them a sense of security and the fry a place for concealment. And what was the best plant? *Nitella flexilis*—they neglected to say where we could obtain some!

Enter the north door of St Paul's Cathedral and look up. Above the door is an inscription dedicated to Sir Christopher Wren, which being translated (shades of *amo, ama, amar!*) reads: 'If you would see his monument, look around'. An effective

way of honouring and perpetuating a man's achievement, one aspect that I feel guppy folk have neglected.

Apart from the Hahnel fantasies and now almost extinct Robson, our fish names give no indication as to who was responsible for producing them. Who were the first pioneers whose skill and perception the hobby seems to have forgotten? Who, I wonder, bred the first pintail, lyretail or lower swordtail? Whoever they were (or are!), I feel sure they would not be pleased to see how posterity had treated their efforts.

By PETER UNWIN

This month heralds the start of the great show lottery game in which you pay your money and take your chances. Recently these 'chances' have included quite melodramatic possibilities because, after benching, exhibitors have found some classes of guppies undersubscribed and at one large show last year classes for the three previously mentioned varieties were devoid of any entries whatsoever. Perhaps it is a good thing those early breeders cannot return?

This part of the column is about guppy history, so if you are of a touchy nature about this subject then take to the hills or skip on to the next paragraph. To those who can never get enough information about our favourite topic, you go with our blessing!

One story in the history of how the *Poecilia* received its name concerns a young Italian, de Filippi. He received his first guppies from his teacher, Panizza: two males and

two females preserved in alcohol! They interested him and, pursuing his zoological work, he obtained some live specimens of guppies from the Reverend Father Arnaboldi who had just returned from the island of Jamaica. The year was 1861.

Thinking them to be a new species he called them *Lebistes poecilioides*—his first mistake; his second was to describe both sexes as sporting a gonopodium. A factor that caused our Albert Guenther promptly to comment: 'If the characters assigned to this very doubtful genus are true, it differs in a very extraordinary manner from the other fish of this family in which sexual differences are observed'.

It means go to the motorist, island home to the Irishman, is regarded by the superstitious as being an unlucky colour—but to the aquarist, green means only one thing, algae, and that makes most of them see 'red'! Green water seems to cause more trouble in the hobby than all of the diseases. But why? Most fishkeepers agree, that other things being in order, green water is a healthy condition—'pea soup' menu to the guppies.

Looking at the subject of feeding generally most fishkeepers try to give their charges a diet that contains all the necessary ingredients but often forget to include the minerals and trace elements so essential if the guppies are to make full use of the genes they were endowed with.

Discarding the red algae (*Rhodophyceae*) and the oceanic brown varieties, most of the green algae are simple, single or multi-celled plants, which not only provide a rich addition to the diet of adult fish but also microscopic creatures for the fry. Some types of algae also provide a shelter and home for the many tiny food animals in the aquarium thus increasing the natural food available.

In our contemporary attempts to provide our fish with a sterile, disease-free environment often reminiscent of the hospital 'operating theatre', we sometimes kill by kindness—unintentionally. I agree that green water is unsightly and forms

Continued on page 24



## MARINE FORUM



**T**HE TANK set-up about to be described was specially designed for invertebrate aquarium subjects to be found along our British coast. The incorporation of a tidal system greatly enhances the well-being of littoral zone animals such as sea anemones. The set-up was achieved on a shoe-string budget (student's grant, to be exact), for those deeply concerned about finance.

The tidal tanks ran very successfully for 3 years, except, of course, for the ironing-out of initial problems and the overwhelming growth of 'Herbert', the shore crab, forcing the necessity to return him to the sea. The tanks used were one sized 24 in. by 12 in. by 12 in. and two sized 16 in. by 8 in. by 8 in. Practical details were the following.

### Preparation of Small Tanks

The first requirement was a hole in the end panel of one small (16 in. by 8 in. by 8 in.) tank. This was drilled, by a glazier, to a size of  $\frac{1}{4}$  in., about 2 in. from the bottom, in the end wall of the tank. A  $\frac{1}{4}$  in. rubber bung with a  $\frac{1}{8}$  in. hole running through it was then purchased from a wine-making shop,

# How to Have High and Low Tides in Tanks

By P. HICKLEY

The undrilled end panel of the small tank and one end panel of the other small tank were removed and the two frames were then joined, end to end, with Araldite, to make one long panoramic tank, the length of which enabled a shoe line to be constructed, and yet still hold less water than the large tank (this will be explained below).

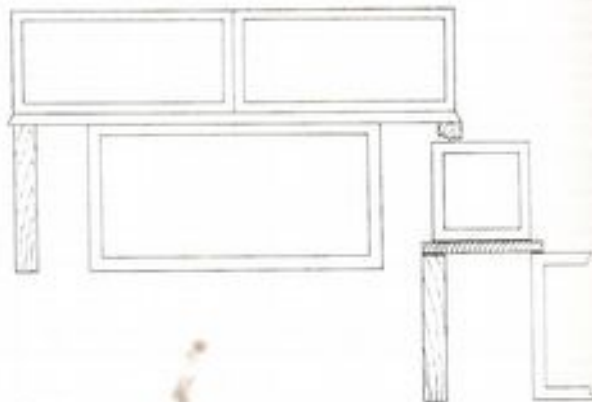
supported the rear of the plank. The tanks were then put in position.

### Siphon and Pump

A piece of glass tubing, of external diameter  $\frac{3}{8}$  in., was taken and bent into the shape illustrated in the diagram. Bending glass tubing becomes quite simple with practice. The area to be bent is heated with a gas flame (a lighter flame is sufficient if the lighter is turned high) until the glass softens and glows red. The glass must be rotated all the time it is in the flame. Then it can be removed from the flame and bent. The sharp ends of the tube are rounded off by holding them in the flame long enough for them to redden.

### Stand for Small Tanks

A stand for the small tanks was constructed out of a piece of planking cut to the size of the two joined tanks, i.e. 32 in. by 8 in. Two legs of 2 in. by 2 in. wood were cut to the exact height of the large tank, so that when the front of the plank rested on the large tank the legs



Frontal view and (inserted, right) end view of the arrangement of the three tanks

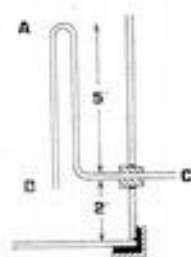
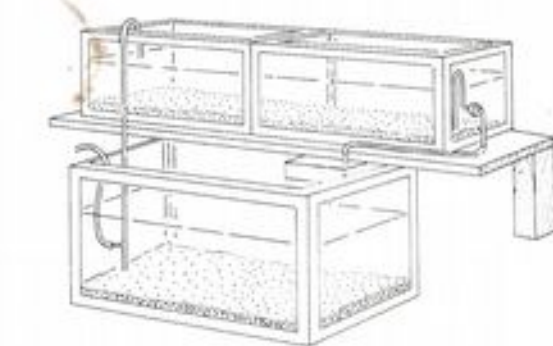
The bung hole was moistened, the bung put on the end of the glass siphon and the bung then pushed into the hole in the tank glass. This gave an automatic siphon, which, when the small tank was filled to level 'A', started and did not stop until level 'B' was reached and air filled the tube. As a precaution against flooding, in the event of a clogged siphon, an overflow pipe can be added by means of a second hole in the bung. Plastic tubing was attached at 'C' to run through a filter (a Tupperware box, packed with wool and with a drilled base), screwed on to the wooden stand, from where water dripped into the lower tank.

A pump was required to raise water from the lower tank to the top two (joined) tanks. A simple air-lift system was used, employing a T-tube and about 18 in. of glass tubing, and assembled as shown in the diagram.

### Setting up the Tanks

Sand was put into the top tank to a depth of about 1 in. at the siphon end and about 3 in. at the other end. The bottom of the siphon (point 'B') was adjusted so that it was about 1 in. off the sand. With this arrangement, at 'low tide', half the sand and the better part of any rocks were exposed and the appropriate animals exposed with them.

Sand, to a depth of 2-3 in., was put into the lower tank. Because of the difference in volume of the tanks,



Outflow devices: A, B and C are described in the text. Z is an overflow tube that maintains water level X and can be fitted additionally to C.



when the small tank was full the large tank was still full to a sufficient depth to allow prawns or fishes to be kept in it, whereas when the large tank was full the small tank was empty. Initial filling of the system was done by filling the large tank and switching on the air-lift. The siphon was adjusted and the air going to the

air-lift adjusted so that the siphon worked at twice the speed of the air-lift pump. This meant that both tanks emptied and filled at the same rate. On average I had two and a quarter tides per day. The complete system is illustrated in the diagram.

I wish success to anyone who tries out the tidal tanks.

## Sea Water pH

By GERALD JENNINGS

Member Marine Biological Association of the U.K.

SEA water, under any set of circumstances, is a solution with a very complex inter-relationship of salts. If, for argument's sake, one takes natural sea water at a density of 1.026 and a temperature of

17.5°C, with a chlorinity of approximately 19 parts per thousand, this water, in equilibrium with the atmosphere, has a reaction accurately expressed as pH 8.19 ± 0.01, which is an alkaline state. For most marine

aquarists, the interest they have in pH can be interpreted as 'how alkaline is my sea water?'

A great deal can happen to alter the regular pH of a closed circuit marine aquarium and any alteration in pH automatically affects the occupants. Natural sea water can, in most circumstances, become less alkaline to around the value pH 7.8 without any adverse effects on the inhabitants, but unfortunately the same cannot be said for most synthetic sea waters, a great many of which are 'buffered'. This means that added to the salts are compounds designed to maintain a constant pH value. Once sea water is artificially chemically buffered it is quite

possible that even a minute pH decrease can cause serious difficulties and, furthermore, artificially buffered sea water, once it has decreased in pH, is notoriously difficult to increase again. This is unfortunately the case with many synthetic waters. 'Buffering' agents are commonly mixtures of a salt and the weak acid from which this salt has been made. For example, the commonest 'buffering' agents for sea water are sodium tetraborate and boric acid, which maintain reaction at various pH values according to the proportions of the two that are used. In natural sea water the content of borate is fixed at around 0.42 millimole/kilogram. This is to be considered the optimum borate concentration.

In addition to the borates mentioned above, several other components make up the 'excess alkali' or 'base' of sea water. These are various anion groups containing the carbon dioxide molecule, and may be present as carbonates or bicarbonates or weak carbonic acid groups. Dissolved carbon dioxide gas and some carbonic acid under normal circumstances are present in equilibrium with the amount of carbon dioxide in the surrounding air.

We can therefore state that sea water is alkaline as a consequence of

the excess of alkaline components over acidic components. This excess of alkali or 'base' is equivalent to the bicarbonate, carbonate and borate.

### How to Change pH

It has for many years been an erroneous conception that when the pH of sea water decreases it should be brought back to normal with a sodium salt—the most popular two being sodium bicarbonate ('baking powder') and sodium carbonate ('washing soda'). Apart from these two, one is also informed, sodium hydroxide or caustic soda may be used.

All three of these can be killers, as indeed can be any sodium compound if used more than just once; sodium compounds can also cause serious mishaps to the aquarium occupants if mishandled. It was contended as long ago as 1931 that this was the case. If, let us say, sodium bicarbonate is used to increase alkalinity (raise pH), then over a period one would not only be adding a large quantity of the required acid neutraliser in the form of bicarbonate, but also a large amount of sodium. This applies to all sodium compounds. Any appreciable increase in the water's sodium

content can affect the aquarium inhabitants to an extent out of all proportion to the quantity it has increased by, and can cause the deaths of many species.

The following are all compounds that may be reasonably safely used to increase pH. Unlike additions of sodium salts, calcium or potassium salts added to sea water are used naturally in ways that avoid the accumulation of calcium or potassium.

Calcium hydroxide or slaked lime  
Calcium hydroxide solution or lime water  
Calcium carbonate  
Potassium carbonate  
Potassium bicarbonate  
Potassium hydroxide (caustic potash)

Any of these should be shaken thoroughly with a small volume of tank water before being added to the tank. Remember, even a minute quantity will considerably increase pH, especially additions of the last-mentioned, so add warily in small amounts. A drastic, sudden, increase is as bad as a decrease. Slaked lime (calcium hydroxide) or chalk, not commercial but natural chalk (calcium carbonate), can be added directly to an outside filter bed if one is present.

## Guppy World Continued from page 21

no part of the living room aquarium, but this doesn't apply to the fish room, surely?

Having been given the green light, why not, dear reader, have a go and tell us what you think?

• • •

If you possess a tape recorder taking a 3 in. reel, if it works at a taping speed of 3½ in./sec., and if you have a desire to take part in an exchange of information about our favourite little fish, then don't delay: contact Dr Victor F. Scholz, 7530 Western Avenue, Los Angeles, California 90047, U.S.A., straight away.

Participants need not belong to any organisation, hobby club or what have you, neither do they have

to live in the States. Dr Scholz is after anybody willing to exchange ideas and information on tape, relating to the care and breeding of the guppy. Folk from Great Britain and Europe are especially welcome.

Come to think of it the production of such a tape could well be taken up by a club as a united project. It would help fill the blank agenda now faced by many club officials.

• • •

Shows and the way we aquarists cope with them have become one of those inexhaustible subjects for discussion. Looking back, more dispassionately than with wry compassion, it seems that over the years the specialist societies have been

divided into two groups; those who want their shows thrown open to all competitors, whether members or not, and the others who said: 'if aquarists want to exhibit their guppies in our shows then let them become members, otherwise they must enter their guppies in the non-members' classes provided'.

There is something to be said for both arguments but those 'non-members' classes' leave some doubt. More often than not they are just two, one for each sex; each a hotch-potch of assorted finnage all jumbled together.

'Guppy World' asks its readers what they think. Would you like to see the specialists keeping themselves to themselves or would you like to emulate the biblical David and take on the Goliaths of the show benches? Your letters should make interesting reading, and can certainly act as a guide to those responsible for making future legislation on the subject.

# The Golden Dwarf Cichlid



*Nannacara anomala* Regan

By **RUDOLPH ZUKAL**

Photographs by the author

**Q**UITE a lot has already been written on this dwarf cichlid, which reaches a size of about 2½-3 in., but I think that this is a species that could merit an even deeper and more intensive study. I could spend hours in front of the tank and never tire of watching these cichlids, for their behaviour is quite individualistic and they often surprise one.

They were imported into Europe in 1934 from their home waters in W. Guayana, Venezuela, Columbia and Bolivia. Because of their beautiful colouring, medium size and individual characters, it should be possible to say that they are often found in aquarists' tanks, or at least in the tanks of cichlid fanciers. But this is not true, at least not in Czechoslovakia. They can sometimes be obtained in great numbers from dealers—then it can be years before one catches sight of them again.

Today, in Brno, it is as if the fish had died out. I cannot explain why this is because, apart from at breeding times, they are not at all quarrelsome fish. What is apparent, however, in these cichlids is a very definite sense of self-interest. I have often noticed that a female will take up a threatening position above the tubifex container and woe betide any other fish that comes near it! It would be attacked. The male will also do this but only if the female is not around—in this species the female is the stronger fish in spite of the fact that she is half the size of the male.

These cichlids do not grub up the bottom of the tank nor do they

Translation by F. MARSH



With fin movements and mouth cleansing the female prepares the surface of the stone that will receive the eggs. The male (right) approaches the female cautiously at this stage.

harm plants. In a medium-sized, well planted tank, at a temperature of 72°F (22°C), they can be kept with other peaceful species. They are quite happy in tapwater, though the water should not be hard and preferably slightly acid. This can be achieved by floating a few Indian fern plants on the surface of the water. Nannacaras like

coarse and living foods. The sex differences are so marked that one could almost believe that the sexes were from different species. The male is large, with pointed fins, quite differently coloured from the female, and a real henpecked husband.

The propagation of the fish presents no great difficulties. I use a 10 gallon tank for it, planted



As the female lays eggs in rows on the stone these are fertilised by the male. The female's colour is seen to have intensified. Spawning lasted only about 10 minutes.



The changed colour pattern of the female that occurs at the end of spawning is easy to see in this photograph. She bit and chased the male away from the stone when spawning was complete and took over the job of caring for the eggs herself.

to look attractive, with a few flat stones laid on the gravel on which the female can lay her eggs. I then raise the temperature to about 80°F (27°C). As explained above, the water should not be hard, but I have often bred them in normal water with a hardness of 12-15 DH.

The female is not particularly fussy as to where she lays her eggs. She will lay them on flat stones, but any hard object will be investigated. I have found these eggs on and under the leaf of a large plant and pieces of wood and flower pots are often made use of. The eggs are fairly large, brownish in colour and sticky. The number of eggs laid is 50 to 100.

The fish spawn in a manner similar to the *Aequidens* species, but with one big and most important difference. The male must be removed immediately after the spawning or he would be bitten to death by the female. When the spawning is over the female takes on her characteristic 'threatening' checkered coloration and then the male dare not approach any more. From my own experience, however, I do know that in a large tank, where the danger to the male is not as great, and undoubtedly in Nature, both sexes share the guarding process. The male guards the eggs by 'patrolling' in a wide circle around them, while the female takes care of the eggs, and after the fry are free-swimming, the brood will be led by the female round the tank.

The hatching of the eggs takes 2 days, and the fry are fairly large. They are free-swimming on the seventh day. The female's care for the young is really a wonderful sight. At first, of course, the fry must be fed with fine food and then reared on to larger foods. They are sexually mature at about 5 months.



After the eggs hatched the female still herded her brood together at any sign of danger. Here she is seen above the group of youngsters near a piece of wood in the tank.



**ELLESMERE PORT T.F.S.** members have been enjoying a variety of activities lately. Talks have included a particularly helpful one by club chairman Mr K. Tomlinson on the difficult subject of the chemical analysis of water, with a demonstration of how to determine pH and water hardness. A visit to HOYLAKE A.S. provided some enjoyable inter-club contact even though the home team won the quiz competition. However, the winners are threatened with stiff competition on their return visit on 13th May. A pair of African pygmy mouth-breeders gained a first place for treasurer Mr F. Skelding recently at a table show for a.v. matched pairs (2, Mr J. Bowyer; 3, Mr K. Tomlinson) and Mr F. Dean, who tied for first place with Mr J. Wedgwood in the table show for livebearers, also won a joint second with two of his fish (J. Mrs N. Stubbins). The Society has also held its fourth annual dinner dance and prize giving. Mrs Carrick presented the prizes and the R. Carrick trophy for most points was won by Mr J. Bowyer. The Society's Breeders' trophy went to Mr P. Stephenson—last year was only his first year devoted to intensive breeding. Other awards were: best characins, Master G. Sims; best loaches, Mr J. Bowyer; best furnished jars, Mr J. Bowyer; best livebearers, Mr F. Dean; best angels, Mr J. Bowyer; best amabantids, Mr W. Collins; best a.v., Mr M. Pay and Mr P. Stephenson. The Society has also produced the first edition of a club bulletin, the Ellesmere Port Tropical Fish Society News.

**SHOW SECRETARY** Mr T. Rendell is organising and staging a single fish knockout competition for **YEOVIL & D. A.S.** The first round attracted 30 entries, each of which was allocated a number and drawn out in pairs. The pairs were judged by a show of hands from members and the winning fish from each pair goes into the next round. Club members going through to the second round are Mr Hulbert, Mr Nicholls, Mr Collins, Mr Rendell, Mr Sealey, Mr Bushell, Mrs Rendell and Miss Burrwood. Treasurer Mr C. Bushell is organising a coach outing for members' families to visit the Torbay Open Show (on the

strength of the Torbay members' promise of good weather for the children on the beach!), and he also tells us of the success of the Society's special 'double membership' subscription. Three marriages are arranged this year from 'double membership' subscribers, including one that will take place on the day of the club's open show. Special arrangements are being made to enable the bride and groom to enter their fish.

A **RECORD** 469 entries were benched at the **KEIGHLEY A.S.** second open show and were received from 29 different societies. Judges Mr Gordon Holmes and Mr Barry Pengilly awarded the splendid 18 in. trophy for best fish in show to A. S. and M. J. Allison from York and the Champion of Champions gold pin. Details of the award winners are the following.

Livebearers, Guppies, Mr and Mrs Ormsher (Southport); swordtails, Mr and Mrs Barnap (Keighley); mollies, Mr Turner (Skegby); platys, Mr York (Independent); a.o.v. livebearers, Mr P. Reynolds (Swillington). Small barbs, Mr Whitley (Aireborough); large barbs, Mr M. J. Allison (York). Small characins, Mr Firth (Bradford); large characins, Mr Holdsworth (Preston). Rainbow and danos, Mr Taylor (Aireborough). Carps and minnows, Mr Spencer (Independent). Sharks and flying fish, Mr Scull (Selby).

Fighters, true colour, Mr and Mrs Cohen (Castleford); fighters, multicoloured, Master Hagenstall (Castleford). Small amabantids, Mr Whitley (Aireborough); large amabantids, Mr Scull (Selby). A.o.v. tropical, A. S. and M. J. Allison (York). Toothcarps, Mr Bailey (R.K.S.). Angel fish, Mrs Gear (Keighley). Dwarf cichlids, Mr D. W. South (Tadcaster); large cichlids, Mr and Mrs Ormsher (Southport). Corydoras, Mr Taylor (Aireborough). Loaches, Mr Pickles (Keighley). A.o.v. catfish, Mr and Mrs Goss (Castleford).

Breeders, Livebearers, Mr Reynolds (Swillington); egglayers, Mrs Gear (Keighley). Pairs, Livebearers, Mr Benzall (Independent); egglayers, Mr Cohen (Castleford). Common goldfish, Mr Cavitha (Bradford). Fancy goldfish, Mr Moorhouse (Bradford). Shubunkins, Mr Isherwood (Accrington). A.o.v. coldwater fish, Mr Hooper (Bradford).

Juniors, Livebearers, Miss Sutcliffe (Southport); egglayers, Master Thickbroom (Castleford); coldwater, Master Hall (Aireborough).

**HENDON & D. A.S.** annual dinner and dance had special significance this year. It was also the Society's twenty-first year since its foundation. Mr Keith Purbrick tells us that among the 150 revellers were many active members who were able to recall all the 21 years and although one or two admitted they were now 'greying at the gills' they intended to give active support for another 21 years. The Committee felt the occasion deserved to be marked in this respect and awarded a small token to the most senior member, Mr Bob Calrow. Mr Purbrick continues: 'By tradition, the occasion was also used to award the two most

coveted trophies within the Society. The Tremen trophy was won by David Allison and the President's trophy by Henry White. To add to our "gongs", our president Mr Roy Skipper gave a new trophy to the club, a superb hand-carved discus in rare wood (to F.B.A.S. standard on a 20 out of 20 basis for size). After a huge celebration cake had been eaten and the lights dimmed on a landmark of an evening, we recalled that our coming of age had covered over 1,000 meetings, and 1,000 lectures... To those who missed this sentimental occasion an invitation is extended to celebrate with the Society at their next function—the open show on 16th May.

**MID-HERTS A.S.** members were delighted to find that about half the annual trophies presented to members by Mr and Mrs C. A. T. Brown at the Society's annual dinner went to the ladies. Mrs Grace Parker won the Ladies trophy, Mr Clive Walford the Hitchin trophy for highest total points in open shows. Mrs Grace Parker and Mrs Jill Marshall tied with 85 points in the award for the highest pointed fish, the Timms Founder trophy. The Founder trophy for *Betta splendens* went to Mrs Ann Withers, the Weller trophy for guppies to Mr Claude Parker, the St Albans trophy for best breeders (egglayers) to Mr Peter Bird and the Welwyn Garden City trophy for best breeders (livebearers) to Mrs Ann Withers. Mr Don Larder won the Aquascope Cup for the best contribution to the club's bulletin.

The Society are planning early for their open show this year in September. It will again be held in conjunction with the Hertfordshire Horticultural Society Show which was attended by 1000 people last year. In addition to the fish show and horticultural show there will be exhibits by the police, and fire services, a dog show, cage birds, trade stands and entertainments. Bars and other refreshments will be available throughout the Show.

**THERE** were 98 fishes benched at the inter-club competition when **STRETFORD & D. A.S.** were hosts to **SALFORD A.S.**; judges Mr A. Bloom and Mr Crompton awarded a total of 1357 points to Stretford against 1030 points to Salford. The best fish in the show shield was won by Mr G. Edmunds of Salford with a very good angel fish (85 points) and the Individual Points shield was won by Mr T. Bebbington of Stretford with 570 points. While the judging was taking place Mr D. Greenland and Mr M. Parker gave a most interesting talk on fish

photography. Other class winners were:

Large: Mr. Hodgson (London), single c.w., Mr. T. Hodgson (London), Mr. A. G. Edwards (London), Mr. C. Edwards (London), Mr. D. Edwards (London), Mr. E. Edwards (London), Mr. F. Edwards (London), Mr. G. Edwards (London), Mr. H. Edwards (London), Mr. I. Edwards (London), Mr. J. Edwards (London), Mr. K. Edwards (London), Mr. L. Edwards (London), Mr. M. Edwards (London), Mr. N. Edwards (London), Mr. O. Edwards (London), Mr. P. Edwards (London), Mr. Q. Edwards (London), Mr. R. Edwards (London), Mr. S. Edwards (London), Mr. T. Edwards (London), Mr. U. Edwards (London), Mr. V. Edwards (London), Mr. W. Edwards (London), Mr. X. Edwards (London), Mr. Y. Edwards (London), Mr. Z. Edwards (London).

Fair weather favored the first open show held by ROTHER-HAM & D. A.S., when egg entries were banded from 50 different societies. The Mayor, Councilor and Mrs. J. Johnson, spent an enjoyable time viewing the exhibits before giving out the prizes. Results were as follows.

Judges Mr. K. Coulson, Mr. R. Hampson and Mr. L. Adby made the best in the show award to a knife fish owned by A. S. and J. M. Allison of York.

A HELPFUL TIP TO THE MEMBER

Who may not know too much yet about the possibilities of individual species in the matter of the size of the holder in which fish should be shown. His comments: All tanks do not diverge but in particular do not try to be kept in a confined space, differentiate they quickly heat over and the better change bars become a more difficult job to obtain, show entered in open about in the breeders' clubs were always "jammed" tanks daily for this very reason. Lightly are not aware of the consequences tendency or are not generally concerned over the nature of their fish, so I would always come down on the side of the exhibitor who gives his tank plenty of room.

RESULTS OF THE HUDDERS-FIELD F.F.S. OPEN SHOW WERE AS FOLLOWS:

Large: Mr. Hodgson (London), single c.w., Mr. T. Hodgson (London), Mr. A. G. Edwards (London), Mr. C. Edwards (London), Mr. D. Edwards (London), Mr. E. Edwards (London), Mr. F. Edwards (London), Mr. G. Edwards (London), Mr. H. Edwards (London), Mr. I. Edwards (London), Mr. J. Edwards (London), Mr. K. Edwards (London), Mr. L. Edwards (London), Mr. M. Edwards (London), Mr. N. Edwards (London), Mr. O. Edwards (London), Mr. P. Edwards (London), Mr. Q. Edwards (London), Mr. R. Edwards (London), Mr. S. Edwards (London), Mr. T. Edwards (London), Mr. U. Edwards (London), Mr. V. Edwards (London), Mr. W. Edwards (London), Mr. X. Edwards (London), Mr. Y. Edwards (London), Mr. Z. Edwards (London).

(London), Mr. J. Johnson, spent an enjoyable time viewing the exhibits before giving out the prizes. Results were as follows. Large: Mr. Hodgson (London), single c.w., Mr. T. Hodgson (London), Mr. A. G. Edwards (London), Mr. C. Edwards (London), Mr. D. Edwards (London), Mr. E. Edwards (London), Mr. F. Edwards (London), Mr. G. Edwards (London), Mr. H. Edwards (London), Mr. I. Edwards (London), Mr. J. Edwards (London), Mr. K. Edwards (London), Mr. L. Edwards (London), Mr. M. Edwards (London), Mr. N. Edwards (London), Mr. O. Edwards (London), Mr. P. Edwards (London), Mr. Q. Edwards (London), Mr. R. Edwards (London), Mr. S. Edwards (London), Mr. T. Edwards (London), Mr. U. Edwards (London), Mr. V. Edwards (London), Mr. W. Edwards (London), Mr. X. Edwards (London), Mr. Y. Edwards (London), Mr. Z. Edwards (London).

MR. H. BROOMFIELD OF COV-ENTRY P. & A.S. achieved a long-held ambition to prove that cold-water fish can hold their own against any tropicals when he was awarded first place for his British specimens in the past egg-layers class in the club's table show. Other winners on this evening were: Pairs live-

beaver, Mr. A. Saunders and junior av., livebearer, R. Coulson. The lecture was given by Mr. Colin



Skidmore and Mr Ralph Tedds from Bedworth on marine aquaria and this proved very informative as both speakers kept the fish themselves and were able to talk from experience. The society is now preparing for its 1970 open show with bigger and better attractions than ever before. The door prize is a fully furnished marine aquarium and a revolutionary prize has been inaugurated—a money pool system. Any fish can be nominated to enter the pool and all the nominated fish are judged against each other in an additional competition. The winner receives a percentage of the total pool money. The Society are very pleased to be able to announce that the lecture is to be given by Mr Roy Skipper of the House of Fishes.

**BRIGHTON & SOUTHERN A.S.** members have recently enjoyed a very successful bring and buy auction, a film show and lecture on killifish shown by Mr R. Browning, and the first inter-club competition of the year held at Portsmouth. There were six classes of livebearers with Portsmouth entering 23 fish and Brighton 15. Awards made to club members in the annual table show competition were: Highest aggregate Cup (6 out of 12 shows): 1. Mr E. Cox (481 points); 2. Mr D. Soper (477); 3. Mr P. Tee (473). Mr Soper also won the Fish of the Year trophy and tied with Mr M. Whittington for the Vic Aldia trophy, breeder's class. Mrs M. Tee won the Ladies trophy and Keith Williams the Junior Class with 438 points. The Dave Harris trophy for the best guppy was awarded to Miss M. Scott.

**OVER 70** members of the **MID-SUSSEX A.S.** attended the lecture by Mr Graham Cox on tropical marines. The talk was accompanied by colourful slides showing attractive arrangements of aquaria containing tropical marine fishes, invertebrates and living corals. The table show for male and female guppies was judged by the Society's president, Mr Tony Croucher. There were 31 entries and Mr D. Soper won the first three awards in both the male and female guppy classes. Anyone interested in attending meetings at Ockley Lodge, Keymer, should contact secretary Mr John Reeve at 36 Rumbolds Lane, Haywards Heath.

**HORSFORTH A.S.** held their members' show at the beginning of March. The 60 entries were judged by Mr Gordon Holmes as follows:

Barbs: 1 and 2, Mr J. Girdham; 3, Mr S. Groves. Cichlids: 1, Miss J. Helm; 2 and 3, Mr J. Girdham. Catfish and loaches:

## how?

How can I avoid fish losses when siphoning tanks containing youngsters?

**OBTAIN** one of those perforated plastic practice golf balls from a sports shop. Make a hole in it large enough to take the end of your siphon tube, so that the tube is a good push fit. Take a square of muslin or any material coarse enough to allow the passage of water but with a mesh fine enough to stop the passage of young fish. Wrap this around the ball and secure to the siphon tube with an elastic band. After siphoning clean the filter muslin by rinsing it under a running tap.

## In Brief . . .

. . . **ALTHOUGH** the office of secretary in the **ROMFORD & BEACONTREE A.S.** has been taken over by Mr R. C. Smith, Mrs K. Heath is still acting as secretary for the Aquarist Section of the Dagenham Town Show (11-12th July).

. . . **MID-HERTS A.S.** bulletin 'Aquascope' is to be edited by Mr George Ralph.

. . . **PRESIDENT OF CAMBRIDGE & D. A.S.**, Mr Elkerton, spoke of the Society's successful year. Membership was in the seventies, with average attendances at meetings of about 30. The Society's show on 21st June is to be kept as a club show this year with a tropical furnished aquaria competition.

. . . **TERRIBLE** weather in March caused **HINCKLEY & D. A.S.** to cancel the table show for a.v. egglayer pairs, but 19 club members heard the slide lecture on fish house construction by Mr Fox of Rosedale Aquatics, Eathorpe.

. . . **HOYLAKES A.S.** (the Warral, Cheshire) increases its membership steadily in both the senior and junior sections. Activities the Society has been enjoying have included a quiz contest with **ELLESMERE PORT A.S.** (won by Hoylake by a small margin) and two lectures illustrated with colour slides, on fish parasites by Dr James Chubb of the University of Liverpool and on ponds by chairman of the Society, Mr A. J. Bland.

. . . **MEMBERS OF BRENTWOOD A.S.** found the talk by Mr Frank Vickers at their March meeting on 'Fish Breeding in Genera' most helpful.

. . . A **GOOD** attendance at the **KEIGHLEY A.S.** meeting in March

1 and 2, Miss J. Helm; 3, Mr M. Barker. Livebearers: 1, Master J. Dagdale; 2, Mrs J. Dickinson; 3, Mr J. Girdham. Pairs: 1, Mr C. Coates; 2 and 3, Miss J. Helm. A.v.v.: 1, Miss J. Helm; 2 and 3, Mrs D. Pell. Anabantids: 1, Mr A. Woods; 2, Mr S. Groves; 3, Mr M. Barker. Characins: 1, Master G. Thickbroom; 2, Mr M. Barker; 3, Miss J. Helm. Best in the show: the Oscar belonging to Miss J. Helm.

A **BLACK** knife-fish, owned by A. S. & M. J. Allison of York was awarded the best in the show award when **SWILLINGTON A.S.** held its annual inter-society table show. The Society with most points was Castleford (23) and Swillington and Aireborough achieved a joint second (17 points each). Winners in the classes were:

Guppies, Mr P. Shipley (Selby). Livebearers, Mr Mond (Aireboro). Barbs, Mr M. J. Allison (York). Characins, Mr A. S. Allison (York). Cichlids, Mr B. Mason (Aireboro). Catfish and loaches, Mr and Mrs Gates (Castleford). Carps and minnows, Mr J. Scarr (Selby). Fighters, Mr and Mrs Cohen (Castleford). A.v.v. anabantids, 1, Mr J. Scarr (Selby). Troutcarps, M. & A. Cawther (Swillington). A.v.v. tropical, A. S. & M. J. Allison (York). Livebearer pairs, Mr A. Jones (Castleford). Egglayer pairs, Mr and Mrs Stringer (Swillington). Livebearer breeders, Mr P. Reynolds (Swillington). Egglayer breeders, Mr and Mrs Cohen (Castleford). Furnished jars, Mr B. Mason (Aireborough).

**MEDWAY A.S.** inter-club annual show ended with North Kent in the premier position with Tonbridge second and Medway third. 132 fishes were benched and these held the attention of the judges, Mr G. D. Forrest and Mr F. Tomkins, almost to announcement time. When Mr Forrest presented the prizes he commended all concerned on the very high standard of entries. The best fish in the show was a red swordtail (81 points) benched by Mr J. Stephens of North Kent. Winners in the classes were:

Livebearers (ex guppies), Mr J. Stephens (North Kent, 81). Characins, Mr A. Harding (Leith, 80). Catfish, Mr R. Baker (Tonbridge, 81). Barbs, Mr C. Hunter (N. Kent, 81). Dussio and rubeus, Mr J. Stephens (N. Kent, 80).

(held at Dean House, Russell Street) resulted in 44 table show entries. 53 members attended the judging competition, which was won by Mr Heap (2, Master Mosley). Table show results were: Cichlids: 1 and 3, Mr Pickles; 2, Mr Collins. Junior a.o.v.: 1, Master Mosley; 2, Master Ellingworth; 3, Master Taylor. A.o.v.: 1 and 3, Mr Pickles; 2, Mr Liddlemore. Novice a.o.v.: 1 and 2, Mr Mossley; 3, Master Cordingley.

... MR W. DUNCAN won the BARNSELY T.F.S. annual cup for gaining most points at table shows during the year.

... THE HALL, that BRACKNELL A.S. have obtained for their Open Show in September of this year possesses plenty of playing space for children outside. Secretary Mrs N. Jordan also points out that it is opposite The Admiral Cunningham Hotel. Members can get in good practice for the show at their monthly table shows at which two classes are always held, a.v. and a specific class.

... BRENT A.S. were hosts recently to HAMPSTEAD A.S. when the first leg of an inter-club match was judged by Mr B. Baker. Brent won this by 33 points to 22. Those present also enjoyed an interesting talk on guppies by Mr P. Abbott.

... AT the table show for a.v. female held by the F.G.B.S. EAST MIDLANDS SECTION, Mr Tom Pilz took the first four places in the superb female entries and the first two in wedgetail females. Judge of the superb, Mr H. Esterbrook, commented on the fine body size and shape of dorsals of these fishes, and on their beautiful caudals. Their main diet, said Mr Pilz, was chopped worms and finely grated liver.

... KINGSTON & D. A.S. members have recently enjoyed lectures by Mr Bob Eason on coldwater fish and by Mr R. Biggs on furnished aquaria. Table show winners at these meetings were: Characin: 1 and 3, Mr J. A. Pollard; 2, Mr D. Gollop. A.v. danio, rasboras, minnow: 1, 2 and 3, Mr W. D. Harper. A.v. cichlid: 1, Mr D. Day; 2, Mr B. J. Pawley; 3, Mr J. A. Pollard. A.o.v. tropical: 1, Mr G. Greenhalf; 2, Mr A. Greenacre; 3, Mr B. J. Pawley.

... THE NUMBER of members of YATE & D. A.S. grows steadily and there was a very good attendance at the illustrated lecture given by Mr Mike Arney of the Bristol & Avon River Board on some aspects of river work, including the care and breeding of British freshwater fishes. Table show results for anaabantids and fighters were: Open

*The Monthly Bulletin of the NOTTINGHAM & D. A.S. for March has a new variation on the 'round of the first cichlid'. They report that a Society member has seen a water marigold flowering before the end of February and query 'Is this a record?'*

class: 1, Mr P. Wright; 2 and 3, Mr J. Powell. Novice: 1, Mr B. Wooten; 2, Mr D. Bates; 3, Mr R. A. Bennett.

... PORTSMOUTH A.S. are celebrating two victories. They won the ASAS Quiz final after a tough fight with BOURNEMOUTH A.S. by a single point, and the table show against BRIGHTON also saw Portsmouth the victors. The club plan an inter-club show on Bank Holiday Sunday, 24th May with 12 classes (one fish per club per class). Films will be shown while judging takes place, or a walk round 'Pompey' can be well recommended.

... HARROGATE & D. A.S. is growing so fast that it has been necessary to co-opt two more members to the committee. These are Mr Michael Allen and Mr Michael Slinger.

... ATHERSTONE A.S. members found the talk by Mr Harvey and Mr Jarvis of Birmingham on the faster growing aquarium plants and water conditions extremely interesting. Mr Wood made a clean sweep of places in the a.v. anaabantid class in the table show and won the best in the show award with a dwarf gourami.

... MR STAN NELSON gave a very interesting talk on tropical marines to members of LLANTWIT MAJOR A.S. and spoke at length

on his methods of making all-glass aquaria and filtering marine tanks. The club now prepares for its open show on 15th June at which 24 plaques and two Challenge Cups are waiting to be won.

... UXBRIDGE & D. A.S., so far this year, have enjoyed lectures by Mr C. A. T. Brown on egg-laying toothcarps and by Mr Colling from the Metropolitan Water Board. A tape and slide show by Mr Braz Walker provided an enjoyable evening when the inter-club show with ROEHAMPTON was held (Roehampton won this by 2 points). At the first table show of the year a junior class was held for the first time. This year is the Society's twenty-first and there are plans to make the open show on 9th May a real success. There are 70 trophies to be won, refreshments from mid-morning and a television room for those interested.

... MEMBERS of LOYNE A.S. were hosts to members of clubs from Kendal, Barrow, Chorley, Lakeland and Scrimston when Mr Taylor, the director of Belle Vue Aquarium, gave a lecture and film on tropical marine coral fishes. The audience found it a most interesting evening—particularly the shots of clown fish breeding in captivity. Club annual awards have been made to Mr D. James (Fish of the Year); Mr A. Tennent (home aquarium) and D. & R. Standen (table shows).

... HOUNSLOW & D. A.S. would be pleased to see prospective new members at their two May meetings. On 6th May, Mr Katritzky, devoted hobbyist and expert on aquarium and house plants, will lecture and on 20th May Mr Dick Armstrong will give a talk. The meetings are held at the Hounslow Youth Centre

## Badge of the Month



Swillington Aquarist Society is 5 years old this month. After its birth in 1965 the Society's members soon made their presence felt at the open

shows and won the Association of Yorkshire Aquarist Societies Award for gaining most points at A.Y.A.S. open shows in 1967, having narrowly missed it in 1966. Other distinctions held by Swillington A.S. are that two of its members gained first and sixth places in the National Furnished Aquarium Competition at Bradford in 1968, and that its president for 1968 was also elected president of the A.Y.A.S.

Meetings are held at Swillington County Primary School on the first and third Tuesdays of each month, and non-aquatic social activity includes the annual dinner dance and car rallies. Members look after some fish tanks in St James Hospital in Leeds.

(Annexe), Clifton Road, Isleworth, London, at 9.0 p.m.

... **BRADFORD & D. A.S.** members enjoyed two first-class lectures in March—one given by Mr Paul Robinson on general fishkeeping, illustrated on the episcope by pictures of a vast selection of fish and their natural habitats—and the other by Mr Rudd on elementary genetics. This was illustrated with films which proved particularly helpful in this subject. Mr D. Kennedy achieved the best in the show award at the Huddersfield T.F.S. Open Show with his knife fish.

... THE annual report of the lecture secretary in the monthly Bulletin of **NOTTINGHAM & D. A.S.** has some interesting comments on the popularity of various activities. Mr Bill Selby reports that by far the most popular features over the year were the lectures, although a quiz evening was well received and proved stimulating. Slides were very popular and Mr Selby suggests that the reason might be that the audience can question or discuss the

subject while it is projected before them whereas with films the subjects are soon gone and, usually, the questions with them.

... **BASINGSTOKE A.C.** members count themselves fortunate to have heard two excellent lectures recently, one by Mr F. C. Tomkins of the F.B.A.S. on breeding, with particular emphasis on livebearers, and one by Mr Bob Esson on coldwater fish. Mr Tomkins expressed his concern at the falling standards of many of the livebearers seen on the show bench these days.

... **WINNERS** in the three classes when **THURROCK A.S.** were hosts for the first leg of the inter-society competition with **EAST LONDON, SOUTHBEND** and **BILLERICAY** clubs were: Platys (25 entries), Mr S. Hendle, Thurrock; barbs (31 entries), Mr J. Edwards, Southend; fighters (15 entries), Mr W. Corby, East London. Thurrock are now in the lead with 14 points. The second leg of the competition will be held at Southend on 31st May.

... **JUNIOR** member Master S. Johnson won the **HYDE A.S.** film quiz with 21 points out of a possible 36. Club members have also enjoyed a talk on marine tropicals by Mr Taylor of Belle Vue and at the table show at this meeting defending champion Mr Ron Andrew started the season well by obtaining a second and three third awards.

... **RESULTS** of the annual points competition among **LINCOLN & D. A.S.** members are: Catfish: 1, Mr Smith; 2, Mr H. Bunnage; 3, Miss Fisher. Anabantids: 1, Mr H. Bunnage; 2, Mr A. Stiff; 3, Miss Fisher. Pairs: 1, Mr B. Bateman; 2, Miss Fisher; 3, Mr Kirby.

... **MARCH** was the month when the **EAST LONDON A. & P.A.** held their first inter-club jar show of the 1970 season. There were over 50 entries and the winners in each class were presented with a carving in teak of an angel fish. The winners were: Barbs, Mr K. Baker; platys Mr L. Baker; fighters, Mr B. Corby.

## Dates for Your Diary

2nd May, **TROWBRIDGE & D. A.S.** Open Show, Nelson Haden Girls' School, Trowbridge. Schedules (early April) from Mr C. Perry, 121 Trowbridge Road, Bradford-on-Avon, Wilt.

3rd May, **DERBY REGENT A.S.** Open Show, Sherwood Foresters Recreation Centre (Normanton Barwick), Osmaston Park Road, Derby (follow R.A.C. signs). Schedules from Mr E. Hazelton, 57 Tewkesbury Crescent, Chaddesden, Derby.

3rd May, **CROYDON A.S.** Open Show, Stanley Hall, South Norwood Hill, South Norwood, London, S.E.13.

3rd May 1970, **BURY & D. A.S.** Open Show, The Church House (behind Parish Church), The Wyke, Bury.

3rd May, **DUKES A.S.** second Open Show, Windford Portland Technical Grammar School, Sparken Hill, Worksop. Show secretary, Mr M. Woodley, 35 Silverdale, Dinnington, Sheffield.

4th May, **UXBRIDGE & D. A.S.** Open Show, Meadow School, Royal Lane, Hillingdon, Uxbridge. Schedules from Mr N. V. Lee, 45 Airedale Road, Ealing, London W.5.

10th May, **OSRAM A.S.** Open Show, Recreation Hall, Peffage Street, Show. Bunching 12-12 p.m., Judging 1.15 p.m.

10th May, **HYDE A.S.** Open Show, The Queens Hotel, Hyde, Cheshire.

10th May, **ASSOCIATION OF YORKSHIRE A.S.** Open Show. Details to follow.

14th May, **ASSOCIATION OF SOUTHERN AQUARISTS SOCIETIES** Convention, Portsmouth Community Centre, Twyford Avenue, Stanbury, Portsmouth. Lectures by Mr Roy Skipper and Mr R. Forder. Tickets 3s (children 2s) from Mrs J. Rowe, 7 Woodley Road, Woolston, Southampton SO4 4DW.

16th May, **CARDIFF A.S.** Open Show, St Margaret's Church Hall, Routh Park, Cardiff. Schedules from Mr and Mrs C. Harding, 158 Pever Street, Cardiff.

16th May, **HENDON & D. A.S.** Open Show, The Brotherhood Hall, Edgware Road, West Hendon, London, N.W.9. Schedules from Mr Reg Sherwin, 43 The Highlands, Edgware, Middlesex (01 932 2740).

16th May, **SOUTHEND, LEIGH & D. A.S.** Open Show, St Andrew's Hall, Electric Avenue, Westcliff-on-Sea, Essex. All enquiries to Mr M. Upton, 12 Merrivale, Bedford, Essex (South Bedford 2841).

17th May, **MERSEYSIDE A.S.** Open Show, The British Legion Club, Holyoake Hall, Crammond Avenue, Liverpool 18.

17th May, **M.A.A.S.** Inter-Society Show, Davyton Manor, Near Tamworth, Staffs. Details from Mr L. Appleyard, 25 Middenhall, Tamworth.

24th May, **ACCREINGTON & D. A.S.** Open Show, St John Ambulance Hall, Bull Bridge, Accrington. Bunching 12-12 p.m. Details from Mr C. Whitney, 47 Lymwood Road, Blackburn.

24th May, **PORTSMOUTH A.S.** Inter-club Show, Bunching by 1.0 p.m. sharp. Details from Mr W. T. Ryder, 403 Commercial Road, Mile End, Portsmouth PO2 7AB.

26th May, **F.G.A.** 1970 INTERNATIONAL SHOW (Home, Birmingham Section), The Globe Farm Community Centre, Globe Farm Road, Stockford, Birmingham 23. Schedules from Mr F. S. Jinks, 151 Stockfield Road, Yardley, Birmingham 15.

30th May, **HARLECH A.S.** second Open Show, Gabalfa Junior School, Colwell Road, Cardiff. Bunching 9.0 a.m.-1.0 p.m. Schedules from Mr A. J. Payne, 25 St Fagan's Rise, Fairwater, Cardiff (phone 351324).

30th May, **TOTTENHAM & D. A.S.** Open Show.

31st May, **HOYLAKES A.S.** Open Show, Macdonald Hall, Banks Road, West Kirby, Wirral.

31st May, **BOSTON A.S.** second Open Show, Blackfriars, Boston. Details from Mr D. Moody, 25 Kingway, Boston, Lincs.

31st May, **COVENTRY P. & A.S.** Open Show, Fishhill Community Centre, Coventry. For show schedules, send a.s.a. to Mr S. Woodbridge, 32 Ridgeway Avenue, Coventry, CV3 5BF.

Continued on page 34

## IMPORTANT REQUEST TO ALL AQUARIUM SOCIETIES

ANY aquarium society interested in the idea of staging a display at The **AQUARIUM SHOW** in London this year (Thursday 20th October-Sunday 1st November) is requested to notify Anthony Evans (Show Organiser, 554 Garratt Lane, London S.W.17) as soon as possible. Such notification of interest is not intended to be a commitment to making a display, but the information now requested is essential for an early appraisal of the likely extent of society participation to be made.



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7th June. **THORNE A.S.** Open Show.

7th June. **NUNEATON A.S.** Open Show. Schedules from Mr S. Bloxham, The Shop, Beaumont Road, Nuneaton.

7th June. **LINCOLN & D. A.S.** Open Show. The Drill Hall, Broadgate, Lincoln. Commencing 2 p.m. Schedules from Mr A. Clarke, 5 Lime Crescent, Brant Road, Lincoln.

7th June. **HYDE A.S.** Open Show. Queens Hotel, Hyde, Cheshire.

13th June. **LLANTWIT MAJOR A.S.** Open Show. Town Hall, Llanrwit Major, Glam. All fish described by 11.30 p.m. Schedules from Mr A. Jobertson, 84 St. Mery's Avenue, Barry, Glam.

14th June. **BOURNEMOUTH A.C.** Open Show. Kirton Community Centre, Bournemouth.

14th June. **LOUGHBOROUGH & D. A.S.** 13th Open Show. Town Hall, Market Place, Loughborough. Schedules will be available from Mr J. Parry, 61 Poplar Road, Loughborough, Leics.

21st June 1970. **SWILLINGTON A.S.** Open Show. County Primary School, Church Lane, Swillington, Near Leeds. Schedules from Mr P. Reynolds, 66 Lawrence Road, Leeds LS8 2HS.

21st June. **ATHERSTONE A.S.** Open Show. Memorial Hall. Schedules from Mr A. L. Trotman, 14 Meadow St., Atherstone.

23-27th June. **BRISTOL T.F.C.** Open Show. Congregational Church Hall, Newton Street (off Stapleton Road). Bristol 5. Details from Mr E. Newman, 21 Somerdale Avenue, Knowle, Bristol 4.

## Classified ADVERTISEMENTS

### AQUATIC SUPPLIERS

**OVER 120 VARIETIES** tropical, marine and pond fish—for personal shoppers only. Kingfisheries, 308 Croydon Road, Beckenham, Kent. Phone 01-650 3716. Closed Wednesdays.

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Continued on page 36

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