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PetFish

Monthly 2s 6d

Vol. 2 No. 5

August, 1967

Subscription rates: £1 1s for 12 issues; 17s 6d for 6 issues (U.S.A. and Canada $5.00)

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In This Issue

PetFish Publications

554 Garratt Lane, London, S.W.17

Telephone 01-947 2805

Advertisement Offices 47 Gresham Street, London, E.C.2

Telephone MONarch 7644

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Comments and Quotes

● Training catfish ● New killifish ● Goldfish 25 years old ● Society Bulletins ● Fish control in Kenya

Self-Feeding Fish

THE news that a New York research psychologist has conditioned a fish to feed itself at pre-set intervals raised hopes that the problem of how to feed the fish during the summer holiday had been most delightfully solved by getting them to feed themselves. Unfortunately the process depends upon the discharge of electricity by an electric catfish, and one of these in a community tank might well make its vacation diet the other tank inhabitants before ever the need arose for it to use its newly taught facility. Dr Frank Mandriota of City College was, in fact, conditioning a small African electric catfish to discharge intensive bursts of electricity upon the signal of a flashing light placed near the tank. A specially constructed feeding machine dropped live worms into the tank as a reward if the fish discharged the electricity after the light was flashed. The catfish took 3 months to learn to feed itself in this way.

Stokes's Rivulus

A PROPOSAL has been made by Mr Al Klee, editor of AQUARIUM ILLUSTRATED, that will be appreciated greatly by all who knew the late Mr Paul Stokes. Mr Klee writes in the May–June edition of his magazine: 'Just a few months ago, Paul Stokes sent a live shipment of killifish to your Editor with a view towards learning their identification. This was at considerable personal expense to him but he asked for nothing in return. He was interested only in helping the BKA and his fellow aquarists. Although the fish has finally been identified as *Rivulus tenuis* (after masquerading as *Rivulus achilles*), I propose that it be known throughout the killifish hobby as "Stoke's *Rivulus*".'

Long Life in a Bowl

ONCE again the authenticated tale of a long-lived goldfish arouses admiration for the tenacity of the most widely kept of all pet fishes. Billy is the 25-year old goldfish belonging to a resident of Morecambe. He has survived a variety of hazards, including two spells on the floor and the addition of soap powder to his water, and his home has been a goldfish bowl (size unspecified). Now he has won himself a tank in which to frolic and it is interesting that the owner, Mr Norman Driscoll, has noticed that already Billy appears to have grown longer.

Society Bulletins

AN idea put up to the aquarist world at large in a society magazine, although addressed to 'national aquatic magazines', has reached Britain from the U.S.A. through the Horsforth Aquarium Society. In the latest Horsforth A.S. journal its editor, Mr R. E. Hampson, quotes the proposal from Mr Guy Jordan of San Diego that an aquarium magazine should 'establish an article of the month series—articles reprinted from club magazines'.

We at PETFISH MONTHLY are

always pleased to acknowledge those items of exceptional interest that appear in society publications and occasionally to bring these to the notice of the wider circle of readers that the articles merit by including them in our pages. This we shall continue to do, and with due thanks to Mr Jordan and Mr Hampson for the offer of their idea we think that such selective use, without commitment to a monthly 'pick', best meets the requirements of all our readers.

Fish Control in Kenya

THE bands of young stickleback hunters as they march out during the school holidays with their jam jars and nets do not realise how lucky they are. In the spring of this year in Kenya the Minister for Tourism and Wildlife prohibited fishing for aquarium fish without a licence. 'Aquarium fish' are defined as any fish, including the brood, fry, young or eggs, which are intended for capture by or sale to any person for the purpose of display in a tank or aquarium. Licences may be obtained from the Chief Fisheries Officer or Fisheries Officers authorised by him, but neglect to do so brings a fine for a first offence of up to £200 or imprisonment for up to 6 months.

LETTERS

Breeding Neon Tetras

I READ with interest the article by Mr J. Lee in the February issue of PETFISH MONTHLY and although it was an excellent and most comprehensive treatise on the breeding of the neon tetra, I venture to submit one or two findings from personal experience in the successful spawning and rearing of this particularly delightful fish. Each of these 'wrinkles', so to speak are of proven merit, and as addenda to Mr Lee's article, may be of interest and value to your readers.

Prize Letter

Firstly, I have found that the depth of the tank water is not of prime importance provided that very narrow niches are created for the breeders; I mean by this, a rock ledge of approximately 9 in. by 5 in. above which a similarly sized flat stone has been placed at an angle of some 20 degrees, thereby affording a confined and narrow retreat. Of these flat stones, I find either marble or slate suffice, but an excellent coarse and 'filamented' surface is provided if both upper and lower ledges are enclosed in a nylon stocking! Eggs will more readily adhere to this fine mesh, and will not float to the tank surface should they become dislodged, but cling securely to the underside of the upper stone. It is interesting that the breeders will not again enter this niche after spawning, but will quickly devour the fry should they emerge and rise to the surface.

Immediately on hatching, the fry will be seen in suspension from the underside of the upper stone and apparently prefer this locale to other parts of the tank; I think, however, that the aquarist intent on raising as many of the spawning as possible is well advised to follow Mr Lee's advice and remove or, better, segregate the parents shortly after they have spawned. I emphasise the word 'segregate' as I am not in favour of any kind of change-over or removal of breeders (of any species) either during conditioning or following spawning, and while either method may enjoy its own modicum of success, it is relatively as simple to isolate the breeders in the same tank by means of a glass dividing panel, more especially so in a long and narrow tank most suited to breeding neon tetras.

One final word: I place a well-rinsed layer of dead leaves over the tank gravel. This may give the soft water a yellowish tint but is quite inoffensive and is most certainly a beneficial factor, evidenced by responsive tolerance levels of the fish. I have been able to expose the frontal glass to sufficient light for time-lapse film sequences under these conditions, and believe that the decayed vegetation may contribute chemical factors common to natural environs, as well as bacteria, Infusoria and unicellular organisms, providing an initial food supply for the tiny fry. Great care should be taken, however, to ensure that this decomposing plant material will not have an effect on the crystal clarity of the water.

To those clubs interested in seeing film clips of the spawning sequences mentioned above, together with similar records of other species, namely discus, *Aequidens portalegrensis*, *Puntius tetrazona*, *Aphyosemion australe* and *Hyphessobrycon rosaceus*, I shall be pleased to forward details on request. The films are 35 mm. clips of some 40 exposures taken in time-lapse of varying periods, and can be screened on any slide projector with roll film adaptor.

c/o 19B Palmeira Court,
Palmeira Square,
Hove, Sussex
ERIC M. CROSS

Domesticated Spawners

I WAS interested in the item about the way in which 'difficult' fish seem to become ready spawners (Comments and Quotes, July, 1967) and think there might well be some such process taking place as the 'inherited domesticity over several generations' that was suggested. But I think that part of the answer might also just be in sheer weight of numbers.

It's always the 'newest' and largely unknown fishes that are being studied, the expensive ones that few fishkeepers are prepared to risk buying. From these few, a lot of essential facts have to be found out, but once these have been discovered quite a small number of aquarists can ensure a sufficient stock to supply

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LETTERS

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many other enthusiasts and gradually bring the price down. Once the fish begins to appear in numbers, the statistical chances of some of them spawning in, for example, community tanks must be quite high.

Also perhaps that curious psychological element is at work that made the 4-minute mile seem a reasonable feat when it had been accomplished just once. (This applies, of course, to the fishkeeper, not the fish!)

Liverpool, Lancs. D. WOODWARD

Fishkeeping is Fun

HAVING just come back from two weeks' holiday at the coast we felt we really ought to write a little note in praise of our hobby and of the magazine through which we became aware of all the subjects linked up with our small tank of tropical fish. We only started keeping fish last autumn through winning a goldfish at a Fair and we enjoyed last winter learning about our new tank, but now we find that through this we have also acquired quite a stake in the open air.

In the countryside surrounding our holiday resort we suddenly found we were interested in garden ponds and it was much more fun to look into the river than to row about on top of it. Rock pools had become underwater worlds instead of tepid paddling pools. Stones had to be considered for shape and colour and a few prize ones lovingly transported home. Even wet afternoons had changed—the local aquarium and not the local cinema became our goal. I still want to win the pools, and I still want a luxury holiday in Jamaica, but now it's not for the food and the sun but to see the fish!

London, N.W.6 MRS V. SEDLEY

Improvised Tanks

I READ the article by Mrs Partridge in your July issue in the nick of time! I, too, had the problem of a tank obviously overcrowded with zebra fish youngsters and nothing to move them into. Then I read that Mrs Partridge had used a 'wooden trough lined with polythene', and as I had some of the plastic sheeting and a stout wooden chest I decided to try the suggestion. It is working splendidly as a make-shift aquarium for growing the youngsters on and it looks as if I shall have a fine batch that will offset the cost of the new tank I shall be buying.

Carshalton, Surrey P. DAVIES

Koi Carp

I ENJOYED reading the article by Mr R. M. Whittington on Nikishi koi carp in PETFISH MONTHLY (July, 1967). I for one have taken up the challenge of keeping some six (three different colours) of these koi, which I obtained early on this year, when they were about 6 in., direct from an importer. They were quarantined for 8 weeks before I bought them and they all seem to have settled down in their new home very happily. This is indoors and measures 8 ft. by 4 ft. 6 in. As Mr Whittington remarked, news on these fish is very scant at present, but I'm keeping notes on my own fish's progress and I would welcome a chat with other koi enthusiasts. I'd be glad to exchange notes with other PFM readers regarding these carp, especially readers living in the north-west area.

I've already discovered that koi prefer running water, so I've built my own filter and running water arrangement, with the aid of a submersible pump. The filter is a must, I find, if you wish to see the fish clearly, since they stir up the bottom badly, which clouds the water, but I've found also that a layer of ½ in. pebbles on the bottom helps considerably to reduce this trouble and I'm able to keep a very clear pool. I await with interest further news in the columns of PFM.

Wilpshire, Nr Blackburn, Lancs. D. F. DAY

Prize Letters

TO the writer of the letter judged by the Editor to be specially worthy among readers' letters published in each month's issue, PETFISH MONTHLY will award a prize of an item of aquarium equipment.

Next month's prize:
An outside-fitting thermostat.

PETFISH MONTHLY will be glad to have your experiences, comments, suggestions etc. in letters on any matter associated with fish-keeping. Write to the Editor, PETFISH MONTHLY, 554 Garratt Lane, London, S.W.17.

"But can we really afford another tank?"

The Characins

—A Remarkable Mixture

By R. McN. ALEXANDER

University College of North Wales

AN experienced aquarist would be quick to identify the fish in the illustration heading the list of characin characteristics on this page as a characin. The feature that gives it away is arrowed: it is the adipose fin, a fleshy nodule behind the main dorsal fin. This fin is not absolutely characteristic of characins, but the only other freshwater tropicals that have it are the catfishes—and anyone can tell a catfish by its spines and barbels. A few characins, such as the hatchet fish, have no adipose fin.

The illustration of the head-and-tail light or beacon fish (*Hemigrammus ocellifer*) also shows one tooth, enlarged, beside the fish. Instead of being a simple spike like most fish teeth it has a row of points joined together by a cutting edge. This is another typical characin feature, but it must be admitted that it is of more use for identifying dead characins than live ones!

I became interested in characins a few years ago when I was a member of a zoological expedition which went up the River Essequibo in Guyana, at the north end of South America. About 40% of the fishes there are characins, and their variety is fantastic. They have probably all evolved from an ancestor very much like the tetra in the illustration. The tetras are not only the most familiar of the characins but are also among the most typical.

Characin Characteristics

- The characins are freshwater fishes found only in South and Central America and in Africa.
- In common with carps, catfishes and gymnotoids, the characins have tiny bones (Weberian ossicles) connecting the swimbladder to the ear.
- Most characins have an adipose fin (also possessed by catfishes, trout and salmon, and some deep-sea fishes).
- Most characins have teeth with several points on them.

Tetras and Hatchets

Few of the tetras grow more than 3 inches long. The most popular are the brightly coloured ones such as neons and cardinals. More common are less handsome silvery ones, often with a dark spot on the shoulder or at the base of the tail. There are a great many species in the rivers running through the jungle in Guyana, and in the swamp pools beside the rivers. I examined the stomach contents of a few of the tetras I caught and found mainly insects in them, but also a freshwater shrimp and a little plant material. The insects must have been caught when they landed on the surface of the water or fell off overhanging branches. The penguin fish is a tetra which swims obliquely all the time with its head towards the surface, apparently in readiness for insects.

The hatchet fishes are characins with long pectoral fins and an enormously deep 'chest' which suggests the blade of a hatchet. They are small like the tetras, and they, too, take insects at the surface. The big chest contains the muscles which work the pectoral fins. In

A trio of silver hatchet fish, a popular characin species for the aquarium. Their unusual shape is partly explained by the development of strong muscles for movement of the pectoral fins, which the fish use when flying through the air

most fish these muscles are around a fiftieth of the weight of the body, but in hatchet fishes they are about a quarter of it.

Hatchet fishes leap from the water and fly through the air for short distances. My impression, watching them from a small boat, was that they rose about a yard from the surface of the water and travelled up to 10 yards. Presumably this is a trick for getting away from predators. Hatchet fishes are apt to jump from aquaria and have on occasion passed close to an aquarist's ear. A buzzing sound has been heard, like the buzz of a flying insect, and it is thought that they flap their pectoral fins like wings. This would, of course, explain the big fin muscles. The flying fishes which live in warm seas have relatively weak fin muscles and do not flap their fins, but merely glide.

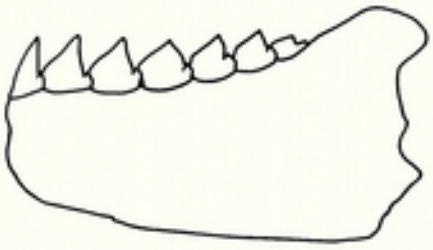
Plant Eaters

There is a group of characins which specialise in eating plant food. They have deep bodies, flattened from side to side, and some are almost as high as they are long. The most familiar to aquarists are probably the various species of *Metynnis* (one is illustrated). They grow to about 6 inches long. Some species of *Myleus* grow much bigger. They eat the leaves of underwater plants, and fruit that falls into the water from overhanging trees. *Myleus pacu* is shot by the Guyanese Indians with bows and arrows. This technique can survive civilization: I have seen an Indian go off to fish, with his bow and arrows, in an aluminium canoe with an outboard motor!

Myleus has strong chisel-like teeth, modified from the typical tetra shape. The bits of leaf that can be found in its stomach are bitten off cleanly. The piranhas, which seem closely related to *Myleus*, also have big teeth, but they are better suited to cutting flesh. A *Myleus* tooth may have an edge like a chisel but a piranha tooth has an edge like a knife (I have used them for sharpening pencils). The piranha uses them for biting pieces from its prey, which includes other fishes, freshwater shrimps and any mammals that may enter the water.

It is said that if you want to get a herd of cattle across a river with piranhas in it, you must first drive your least good cow into the water a little upstream of the ford. All the piranhas in the neighbourhood will converge on it and in the 10 minutes or so that they take to reduce it to a skeleton they will be too busy to notice the rest of the herd being driven across. There are plenty of other gruesome stories about piranhas and some of them are probably true, but I would not like to vouch for that particular one. While we were in Guyana we kept out of rivers with piranhas in them, and came to no harm.

Piranhas grow little more than a foot long, but they seem to keep together in shoals and their numbers may make them dangerous. Where they live they are the easiest fish to catch provided you do not make the



The lower jaw of a piranha (*Serrasalmus rhombeus*)

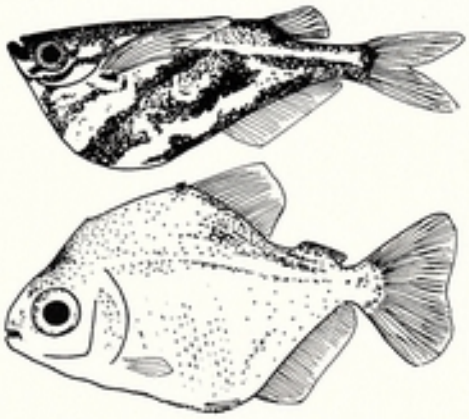
mistake of using delicate tackle. A good stout hook is needed, fixed to the line with strong wire. They are rather bony, but not too bad curried.

Young piranhas can sometimes be bought in this country from aquarium dealers. I kept one for some time and used to feed it pieces of raw meat or liver, dangled in the tank on the end of a string. It took clean bites from the liver, but had to worry at the meat to get pieces off.

Fishes which bite pieces off their prey are unusual. Most predatory fishes swallow their prey whole, and use

their teeth for seizing it rather than for cutting it. Various characins eat fish whole, but they do not seem to be imported regularly. Presumably they are thought unlikely to appeal to aquarists, and one can see why! *Hoplias malabaricus* is one of them, and is common in Guyana. It grows to a length of about 20 inches, and has a big mouth with simple spiky teeth instead of the many-pointed ones which are typical of characins. It lurks among underwater plants like a pike, and takes its prey unawares.

There is another group of characins which feed on the decaying vegetable matter that accumulates in slow rivers. They can perhaps make use of garbage as well as more natural sources of food, for we found one species to be very common around the jetty of a large riverside



A hatchet fish (Carnegiella strigata, top) and Metynnis schreitmuelleri

village. *Hemiodus* is the best-known genus and is occasionally stocked by British dealers. They are silvery fishes growing to about 8 inches long. They have small round mouths with tiny teeth in the upper jaw and no teeth at all in the lower one. Their kind of feeding does not need very formidable jaws.

I have already mentioned the penguin fish, which swims with its head up. The headstanders and *Anostomus* have the opposite habit, of swimming with their heads down. They have small mouths and seem to feed mainly by nibbling the fluffy green coating of algae off submerged rocks and plants. *Anostomus anostomus* is a particularly attractive fish, with black and yellow lengthwise stripes and red fins.

I have left a great many sorts of characins unmentioned. I have written only about the South American ones and nothing about the African ones. Even among the American ones, I have left out the pencil fishes and many less well-known groups. The variety of the characins is extraordinary.

personal comment

by ARPEE

THE somewhat odd characteristics of the staggered hatching of the pooni eggs (*Aphyocypris pooni*) that I mentioned in the May issue got me thinking about the likely cause. I am reasonably sure that the long delay before the fry were obviously off the ground was attributable to the cold layer of water which lay on the tank floor, in which many of the eggs developed. As there was no aeration in the tank, stratification of the water would have been quite marked, and there was probably a 10° (F) differential between that on the surface and that on the bottom. Some eggs, of course, got caught on different bits of the mops; the higher ones hatched first because they sat in warmer water. It would be very interesting to speculate whether the size difference arose from the same factor. I think it likely in a number of cases, though some would certainly have differed for constitutional reasons.

The use of an aerator in a spawning tank is not always a good thing, but is certainly not harmful in some cases, and I shall introduce one when spawning the pooni again, to judge the effect. Whilst on the subject of aeration I should be very interested to hear whether Mr Tench of Warrington, to whom the Editor awarded the monthly prize in July, 1966, has changed any of his ideas on the subject since the event. I have very little doubt that he will, on the whole, be rather more favourably inclined to aerating equipment than he was, but I am equally convinced that he will find it difficult to explain why; perhaps we may have the benefit of this reader's experiences when he has an opportunity to write.

For some reason or other many aquarists keep white worm in wooden boxes. The worms are not, however, as co-operative as they might be in presenting themselves in reasonable numbers when feeding time (for the fish) arrives. They either absent themselves completely, and in this they can hardly be blamed, or they assemble in such vast masses that they exhaust the local air supply and putrefy wholesale. The aquarist is too late to do anything but start again if the latter happens, but he is often told that the remedy for disappearance of the worm is to warm the culture. The whole problem usually is to find somewhere hot enough and convenient enough to persuade the worms to appear without unduly great delay, and the answer is not to put them on the gas- or electric-ring on the cooking stove. I find it much more convenient to keep the worms in fibreglass or similar bulb bowls. The simple round ones are best, and when you want worms in a hurry you fill a washing-up bowl with near-boiling water, and float the bulb bowl in it. The worms usually reach the surface in 20 minutes to half an hour.

If the Compleat Angler is the chap who can always lay hands on a dozen or so earthworms on Midsummer Day, surely the Complete Aquarist is distinguished by the ability to provide *Daphnia* for his charges at least once a week from the beginning of May until the autumn frosts, commercial sources excluded. Every so often you come across a *Daphnia* pond but fail to recognise it as such; not surprisingly, these minute crustaceans do not exactly advertise their presence, and it pays to test any likely waterholes with a fine muslin net, as, even if only a few are in evidence changes occur very rapidly once the sun has been at work for a few days, and a good stretch of 'green' water can soon provide you with an excellent haul of this wonderful live food which depends so largely on suspended algae.

In the country, any waterhole to which you can legally gain access is worth investigation, but the quest has essentially to be conducted solo. Sad to say, the aquarist seldom if ever tells even his best friend where his *Daphnia* come from, and it is wise to accept this with good grace. Any subterfuge, such as tailing a daff-catcher at dead of night, is likely to be met with equal cunning, and you are as likely to be enticed to the Trafalgar Square fountains as anywhere; this is not the best place in the world in which to appear with a large muslin net at midnight, as this in itself is embarrassing and the *Daphnia* yield is very low. You are therefore far better advised to spend your spare time looking for your own ponds, but to the town-dweller this is something of a hopeless task.

Anyone who has a garden with a few square yards to spare can experiment in the breeding of his own *Daphnia*, and the results are as varied as the recommended methods. The basis is a couple of small pools, about 4 ft. square will do, by about 18 in. deep. In this climate it should not be difficult to fill them, or let them fill, with rainwater, after which it should be allowed to go quite green. If you infect one of these pools with water fleas you should find that, within about 2 weeks, the water is alive with *Daphnia*; they can be fed with bucketfuls of green water from the other pool, which constantly gets topped up and retains its greenness. Some advocate that you should put dried blood, bone flour and numerous other foods into the second pond, to act as a stimulant to the process, but I have found this disappointing, and the far simpler green water method works better for me.

Curiously, I have a ready supply of *Daphnia* in smallish quantities from a rainwater tank outside my cottage. This takes much of the water from the roof and has a layer of every conceivable sort of rubbish on the bottom. *Inter alia*, it contains bird droppings, lumps of bread, mortar rubble, leaves, plenty of rich black mud and the contents of numerous old bird nests. There are *Tubifex* worms in the mud and usually some tasty-looking 'bloodworms' as well. The water is usually quite clear, and it is not at all obvious what the *Daphnia* feed on. They have been there for several years now, and have provided 'infections' for several local aquarists who have tried to start up their own cultures. A rather more ambitious effort in my garden, using the 'green water' method applied to two 6 ft. ponds, has been moderately successful, and the good concentration of *Daphnia* which disappeared with the winter became evident again as the weather warmed up a bit, and I am hoping that this will become a permanent feature.

Those who, after every endeavour, fail to track these creatures down, may obtain small quantities from a number of advertisers in PFM, through the post. This is an expensive way of feeding your fish regularly, but if you start up some trial breeding ponds, these small consignments will be quite adequate to get the main culture going.

Building up a collection of fish is great fun, particularly if you do it gradually and know in advance what your targets are. There was one tetra, the Emperor, which, somehow, had never appealed much to me from what I had seen about it on paper. The pictures were hardly more inspiring, and I had a distinct prejudice against that devilish looking three-pronged tail. This has never figured in my plans. However, I read Mr Lee's article about it in the March issue of PFM, which whetted my appetite a little, but even this left a great deal of doubt. The break-up of a large local collection altered all this. I watched a trio of these fish as though I had never seen a fish before, and they were soon in a bag and on their way to my quarantine tank.

Their body colours put me straight in mind of those of the Siamese cat, which even a feliphobe like me finds fascinating, and those glorious glowing turquoise eyes have to be seen to be believed. Above all, they tumble around the tank in a most engaging way and seem to eat anything and enjoy it. I love to see fish who like living as much as these obviously do, and I readily accept conversion to their cause! This is one fish I have bought in the last year which I think will qualify for a tank on its own. I am hard pressed for space, like most aquarists, and can only spare one tank for pure luxury purposes. Hitherto this has been occupied by glass perch, an old favourite of mine, which have produced (and consumed) quantities of young without exactly impressing. I think there will have to be changes.

A gardening magazine comments upon a new form of greenhouse glass, which, under the influence of hot sun, turns opaque, only to regain its clarity under cooler and darker conditions. This is of considerable value to the gardener, who otherwise has to shield his plants from the heat of the sun, even that of an English summer. The thought immediately occurs as to whether this is likely to have any application to aquaria as a means of curbing algae, but it would seem improbable that anyone would take the risk of applying it to all four faces of a tank. It might well find favour on the two ends, or on the two ends and the back, leaving the front panel permanently clear. It will be interesting to watch developments; if anything comes of it, at least one of my friends will be able to dispose of several hundredweights of hardboard covers and about a year's supply of newspapers, under which the contents of his fish house disappear for a surprisingly lengthy period of the year.

PETFISH MONTHLY Test Report on the

Perma Air Pump

The Perma (in the foreground of the picture) on the PFM test bench during measurement of its air output by meter

HIGH air output was once the province only of piston-type pumps, but improvements made to diaphragm types of aerators have meant that compact models with most impressive performance figures are now available. One of the latest models of these is the Perma Pump (manufactured in Germany, distributed in this country by Aquatic Hobby Ltd.), and PETFISH MONTHLY has had a Perma under test for 2 months.

Construction. The Perma has the form of an upright cylinder of metal (⅛ in. thickness sintered zinc; stove-enamelled finish, blue) with chromium-plated top and bottom plates. On the top is a large and easily manipulated rotating control with a dial showing settings 1–10. Overall dimensions of the pump are 5½ in. high, 3½ in. diameter and it weighs about 3¾ lb. The base has three rubber feet which keep the pump about half an inch above the supporting surface. The electric wire enters at the top edge of the cylindrical body and the air outlet projects from the bottom edge. A small plastic air inlet capable of holding a small amount of cotton wool as air filter is contained in the base.

The rubber pumping unit is fixed to the bottom of the cylinder and the electromagnet coil is suspended vertically above this by its attachment to the top plate. Alternate up and down movements of the magnet mounted on the rubber provide the pumping effect, there being no vibrator arm. Three screws secure the top plate and two slots ensure that the top fits back into its correct position if it is removed (the makers do not recommend removal of the top plate). Removal of the rubber pumping unit is accomplished by unscrewing three screws in the feet of the bottom plate.

Operation. The Perma is quite silent when working, although we found that as the supporting feet of the pump are made of rubber that is much too compressible the vibrations from the body were transmitted to the wooden bench on which it was placed. Additional rubber pads inserted beneath the feet readily overcame this. The pump was fitted to an elaborate small-bore plastic airline system feeding tanks at distances up to about 12 feet away from the pump and having air diffuser stones that were not new ones and hence could be expected to be of high resistance. Under these conditions an ample supply of air was released through the 28 diffusers and six filter outlets (all in 15 in.-deep aquaria) at scale settings 7–10 on the pump (settings 8 to 10 in this range appeared to give similar outputs, all very close to the maximum output). The makers' claim that 40 to 50 diffuser stones could be operated by the Perma therefore seems to be a reasonable one, assuming that a piping system of lower resistance than our test system is to be used.

On a meter the outputs recorded were:

Setting	1	5	7	10
Litres of air/min.	1¾	2½	3¼	4½

When running the unit becomes warm but does not heat excessively. Monthly replacement of the air-intake filter cotton wool is the only maintenance suggested by the makers.

Price of the Perma Pump is £10, and it is guaranteed for 12 months. There is also available a Perma Export model, without the variable output top control, with a quoted output sufficient for 35 to 40 diffuser stones (price £7 10s).

The Reproduction of Fish

By DAVID GUNSTON

LIKE all animals, fish start life as eggs produced by their mothers, but the way in which these eggs, which may vary in diameter from half-an-inch down to one-eightieth, are fertilised and subsequently developed, falls into three distinct categories. By far the commonest is fertilisation by the male fish and development outside the mother fish's body. Less common are instances where eggs are fertilised internally, and then develop outside. The third method, shown by the aquarium 'livebearers' and viviparous fishes like the sharks, is for the eggs to be fertilised internally and the young to grow internally as well, being subsequently born rather than hatched.

The first system is admirably suited to fish in its very simplicity, and its inevitably hit-or-miss procedure is offset by Nature's amazing fecundity, as shown by the vast numbers of eggs laid by each female fish. Fish eggs are nearly always produced in abundance. Actual counts of ripe eggs from normal-sized females have yielded staggering totals, from 2 million carp eggs to 160 million ling eggs. Trout are small egg-producers at 4,000, but 9 million from a 70lb cod and 15 million from a 28lb conger eel are typical.

Eggs that are shed into the water may either drift or sink, and as a rule it is the very small ones that drift with the currents. With those cartilaginous fishes (sharks, rays, dogfish etc.) that do shed their eggs into the water, each egg is enclosed in a large horny capsule conforming more to the shape of the future fish than to the comparatively big yolky egg within.

Haphazard Spawning

The eggs of all species are very variable in size, colour and number relative to the age of the females and the time of spawning, in natural waters autumn spawners nearly always being more prolific. This is probably designed to offset the greater risks that face autumn-hatched young fish, and always the egg and larval mortality of every fish in the world is appallingly high. If it was not, then every patch of water on the earth's surface would be solid with fish!

The lowest form of breeding, method one, is followed by a great many fishes, especially those that live in shoals. The males and females come together at breeding time, and then quite indiscriminately and without any semblance of individual mating, both sexes discharge their reproductive products into the water and move on.

Only a fraction of the deposited eggs are in fact fertilised, and their subsequent fate is of no concern to the parent fish whatever. Their respective sex organs increase greatly in size as eggs or sperms multiply, and the response of such fish to the mating urge is simply to relieve the pressure by a haphazard discharge of their sex products. Only by the pre-arranged proximity of the two sexes is it ensured that reproduction will take place. The eggs themselves have no mobility, but the male sperms, or 'milt', are highly active, swimming excitedly towards each egg, probably attracted by some chemical therein. Once fertilisation has taken place, the egg wall immediately hardens and so prevents the possible entry of later sperms.

Pairing

Some species, whilst still following this somewhat fortuitous method of reproduction, have developed some degree of courtship and mating behaviour. The cichlids, and salmon and trout, for instance, have fairly elaborate courtship habits, an unmistakable pairing by two fish, preparation of the bottom for the eggs by the female (by trout, at least), and typical accompanying defence actions by the male.

With trout especially, preliminary courtship and nesting preparations have often been mistakenly regarded as the spawning act proper, but in fact they are additional to it. The error often arises by the male trout or salmon's distinctive way of coming alongside his mate and quivering his body rapidly, which he does many times before the female is ready to deposit her eggs in the little pit she has nosed out of the bottom gravel.

When she is finally ready, both fish lie side by side over the mouth of the pit, and the ova and milt are discharged into it simultaneously. This ensures a fair degree of fertilisation in waters where the current may be strong. The semi-monogamous situation may break down when other nearby males rush in to add their milt, and in any case, after this brief pairing, the fish disperse, separate and play no further part in the procreative business. With salmon there is less definite pairing, but a more complicated breeding cycle that builds up to the final spawning—and the subsequent death of the fish in the self-same stream-bed in which they were hatched long before.

With the second breeding method, in which the eggs

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Bristol and G.S.G.B. Contest

Agreement over Standards for goldfish judging now within sight

EVENTS in the goldfish world are moving fast. At last it seems the barriers that have kept the various bodies apart are rapidly breaking down and there is every prospect of a unified approach to this oldest of domesticated fishes. Not before time, of course, and it would appear that with tolerance and understanding of the various points of view, an attitude will evolve that will carry this branch of the hobby into the future based on the soundest of foundations.

At any moment now the Federation of British Aquatic Societies are expected to accept the Standards as laid down by the Goldfish Society of Great Britain when minor details are finally thrashed out and safeguards approved. The Federation of Northern Aquatic Societies have also intimated their sympathies with the movement going on. It only now remains for the Bristol Aquarists Society to consolidate their views to decide one way or the other whether to go along with the G.S.G.B. or to continue alone.

As a step towards closer liaison between Bristol and the G.S.G.B. an inter-club show was held in London on 4th June with the G.S.G.B. acting as hosts. Bristol nominated the varieties to be shown and two judges from each club, Mr Emery and Mr Capaldi (Bristol) and Capt. Betts and Mr Wilson (G.S.G.B.), adjudicated in what must have been the closest fish competition on record.

Of the 4,500 points cast by the two sets of judges only 40 points separated the grand total of each Society, which represents less than 1% divergence of opinion on the quality of the fish shown. This unanimity of assessment was reflected in the individual fish of each class. For example in the shubunkin/singletail 4 in. max. class, only 2 points prevented complete agreement on Miss Daphne Morris's winner. Three points separated the agreed winner, Mr Whittington's 5 in. min. shubunkin/singletail.

In the common goldfish class there was complete and utter agreement both as to the placing of the first three fish and, more astounding, identical marking. There would appear to be some divergence of opinion over what constitutes a first-class oranda, for G.S.G.B. would have given first place to the second placed fish (on average) and, more disturbing, there was a difference of 6 points. There was no difference of opinion on what constitutes a standard fantail, for both sides had the same points for first and second places. Mr Jago's fish won in the common goldfish and also the fantail class, and Mr Capaldi's oranda headed its class.

The final result was: Bristol A.S. won the contest with three firsts, three seconds and three thirds, against the G.S.G.B. two firsts, two seconds and two thirds. Bristol were worthy winners in a keen contest and the G.S.G.B. are hoping to get their revenge at the return contest in Bristol when they will be nominating the varieties to be competed for.

The closeness of the pointing perhaps speaks more for the experience and ability of the judges than for the Standards themselves. Members of the Bristol Society do concede the flexibility and detailed working possible with the G.S.G.B. Standards, and one can sense their sympathy for a unified set of Standards. As G.S.G.B. Standards are designed as much for the exhibitor as they are for the judge, closer and more accurate assessment is possible, obviating personal idiosyncrasies. This is something that came out sharply in the contest.

The Reproduction of Fish

Continued from page 171

are internally fertilised yet developed outside in the water, it sometimes happens that the mother fish's body is simply a convenient receptacle, or nest, in which the eggs remain whilst they are fertilised, and for a time until they are ready to hatch. Rockfish, for instance, actually 'sit' on clusters of fertilised eggs until the young emerge, but these baby fish do not really develop inside their mother's body drawing nourishment from her: she merely protects them and clearly has no real interest in what she is doing! This method is rather uncommon with fish, and has in fact evolved in some cases into the third and final method.

Fishes which produce eggs that are both fertilised and hatch into young internally include the sharks and rays. Pairing takes place when the male fish grapples with his mate and introduces his milt into her body through modifications of his side-claspers. Skate are said to copulate in this manner for 20 minutes or so, and in all the cartilaginous species there is a definite mating act, followed in due course by the ejection of completely formed baby fish from their mother's vent. The eggs of these particular species have no yolk, so the embryos derive their nourishment direct from their mother's blood stream, a process closely allied to the breeding habits of mammals.

For the majority, however, reproduction is a chancy affair. Fertilisation and survival into mature fish are the lot of only the lucky eggs, and only if the numbers of eggs laid are few, do the parent fish, however crudely and instinctively, provide some degree of care for their future offspring.

For the Marine Tank

Clownfish

By H. R. LUBBOCK

CLOWNFISH are increasing in availability, and most aquarists will have by now surely seen some of these beautiful fishes. There are many different species inhabiting the coral reefs of the tropical Indo-Pacific: occasionally ones such as *Amphiprion laticlavius*, *A. bifasciatus* or *A. bicinctus* are seen; however, the most commonly imported are *A. percula*, *A. ephippium*, *A. sebae*, *A. xanthurus* and *A. akallopisos*. These are all hardy and are some of the best fishes for the beginner to the tropical marine aquarium.

They are all easy to feed, and can be trained, with some patience, to eat from their owner's hand. They will accept *Tubifex*, white worm, *Daphnia* and brine shrimp, as well as dried foods: of all these, brine shrimp is the best, in that they will not pollute the water, since they swim around until eaten. Even fairly large clowns will eat brine shrimp, which is not surprising as plankton constitutes a major part of the clownfish's diet in the wild. As with freshwater tropicals it is a good idea to alternate, and not always feed with the same food. Do not overfeed, as this is bad for the fish and may also pollute the water.

Clownfish can be kept successfully without an anemone, even though they are always found living in one of these in their natural habitat. This is just as well, for anemones are usually rather expensive, and only large ones are of any use for clownfish, ones of 4 inches being the minimum diameter. If, however, the aquarist does decide to try to keep these two together, there are several things to remember: firstly, the larger the tank the better, as anemones emit a slime which can pollute a small tank rather quickly. Secondly, if the fish contract a disease they should be treated in another tank, since use of copper sulphate and some other medicines will result in the death of the anemone; similarly, water from copper pipes should never be used when making up artificial sea water. Thirdly, care should also be taken not to have any exposed heaters, which could burn the anemone. On the whole it is best for the aquarist to wait until he has gained some experience with his fish before trying to keep an anemone with them.

It is very useful to have some hermit crabs in the aquarium, as long as they are not too large. They are unaffected by copper sulphate etc. and make excellent scavengers, eating any left-overs on the bottom. I usually supplement my hermit's diet with *Tubifex*, since the left-overs do not amount to much.

Newly acquired fish should be kept separate from existing old stock and put in another tank for a week or two. There are several reasons for this: it avoids the danger of disease being spread to other fish; if needing treatment the new fish can be cured separately. Another factor to remember with a new fish is that, unless kept separate, he will get very little to eat, as the older inhabitants will eat all the food first. They may even deliberately push him away and attack him because of their greed. Only when the newcomer has become used to one's presence and knows when it is feeding time should it be put in with the others; for then it will be able to fend for itself and get its fair share of food. As new fish are rather shy at first, brine shrimp is the best food for them, since this can be eaten at leisure.

As far as decoration goes, it is a great help to have coral and sea shells (which should be carefully boiled and cleaned out, as there is sometimes dirt in the top of the spiral section) since these tend to keep the water alkaline, and provide hiding places for the fish. I have also found that algae growing on the coral etc. are very useful in keeping the water clean and pure. Sand is better not used, as dirt accumulates in it, unless of course the tank is a show tank, in which case a depth of about one inch is sufficient. It is best to change the sea water completely every 2 or 3 months owing to the accumulation of soluble fish wastes.

Clownfish have been spawned in captivity; the following description is of some interest, as the spawning

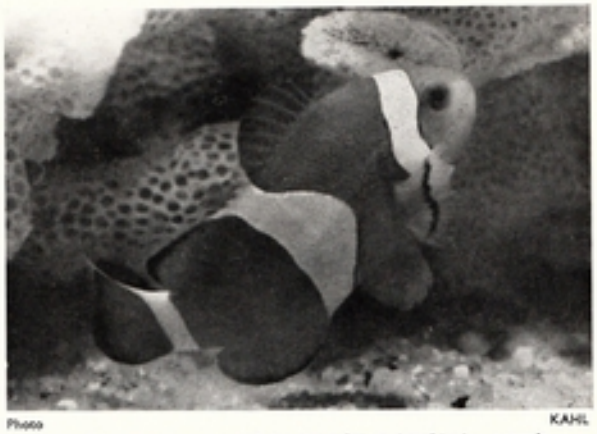

Photo KAHL

One of the most common of the clownfish is Amphiprion percula

of clowns has been observed in captivity by very few people. The spawning is preluded by the pair cleaning a rock, in cichlid fashion, which is near enough to their home anemone to enable it to cover it with its tentacles. As the spawning nears, the pair become agitated and cease to feed. They nudge and chase each other. Eventually, after looking around for any potential dangers, the female starts to lay the eggs on the rock; the male criss-crosses them and fertilises them. The eggs are either protected by the pair, or by the anemone, which the fish seem to prod to make it protect the spawn by opening its tentacles wide enough to provide a covering over the eggs. Although the eggs have on occasions hatched, the fry in every case have died through lack of some unknown necessity.

Perhaps somebody will one day discover the secret of successfully spawning clowns and raising the fry, thus lowering the price of these fish, which have at the moment to be imported from half-way round the world.

For the Community Aquarium

The Bleeding-Heart Tetra

ALTHOUGH the community tank owner aims at providing a pleasant setting for all his fishes, there are some, such as black mollies, red swords and platys, that because of their bold shape and dense colour are capable of looking colourful and attractive against almost any background. Others really repay the bit of extra effort spent on their presentation and like diamonds against a velvet background are enhanced by their setting.

One such fish is the South American bleeding-heart tetra (*Hyphessobrycon rubrostigma*). This is a fish for the well-established community tank, for a tank quite heavily planted containing 'old' and preferably soft, acid water. (It is not difficult to bring tank water to a degree of softness and acidity; the use of clean rain water and filtration over peat will achieve this result.) When the water condition is right, the carriage and colouring of this fish is very fine.

It has a deep, laterally compressed body suffused with a pinkish bloom against which the bright red mark from which it gets its common name stands out on its side. It carries a black vertical streak across the eye, and a black edge to the anal fin, but the boldest coloration is to be found on the dorsal. A broad black stripe, edged on each side with white and further bright red colouring is to be seen on the rays at the front of the dorsal which gives to the fin a very nice effect of a backward-sweeping curve.

A dark background helps to show the fish to its best advantage, but perhaps the most effective way to display this tetra, since it is a shoaling fish, is in the type of community tank where small shoals of only three or four different species are kept.

Temperamentally, the fish is active and vigorous and although not perhaps so placid as, say, the cardinal tetra, it is a very suitable addition to any community of well-grown fishes. It does itself reach a size of about 1½–2 in. and although it swims in the lower portions of the tank it will eagerly dash to the surface at feeding time for medium-sized dried food, *Daphnia*, white worms and chopped *Tubifex*. Some live foods should be given regularly.

Guppy Comment

By
BILL ARMITAGE

MAY I thank all those readers who have written letters. It is most gratifying to know that 'Guppy Comment' continues to arouse so much interest in guppy circles. Unfortunately it is not possible for me to reply to all the letters in the space allocated to me. Therefore readers are asked to bear with me if some of the replies are generalised. It will always be a pleasure to receive and acknowledge readers' letters, no matter how critical—although I do like them to be constructive! The sole aim of this page is to further and invoke the interests of the guppy breeder, and in doing so no claim to being infallible is made.

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Undoubtedly the most important recent event in the world of guppies was the International Guppy Show at Manchester. I do not apologies for making my main topics this month items that relate to it and my visit.

Mr Phil Jinks' most interesting letter in PETFISH MONTHLY (June), stating the findings of his experiments relating to split fins, was the foundation of quite a few discussions at the Show. A somewhat disturbing fact that arose from these discussions was that, although a large number of breeders agree that the fault is hereditary, inbreeding continues and it is left to the odd one or two breeders such as Mr Jinks to experiment and try to eradicate it.

As Mr Jinks rightly points out, it will take an enormous amount of research if we are ever to arrive at an answer, and guppy breeders can help a lot in this direction by putting on record their observations. If a satisfactory solution is ever found to this problem, what a fitting tribute it would be to the late Mr W. G. Phillips, president of the F.G.A., who during the latter part of his life spent a considerable amount of time and money trying to find a solution.

Mr Hardman's letter on split fins is also very interesting, and although his theory that the male splits his fins in courtship display isn't new, it is more than likely that his experiments are unique, and are almost certain to be tried out by some breeders.

At Manchester Mr Andy Wallace of Glasgow informed me that he is not troubled with split fins at all. He attributes this to the fact that he feeds with dry foods only. Now Mr Wallace, as most of us are aware, has bred some of the finest guppies in the world, and if his feeding methods are successful with guppy strains other than his own, it would seem our troubles are at an end.

• • •

It was unfortunate, I thought, that quite a number of the show jars at Manchester were only half filled with water. According to F.G.A. rules the water should not be below the shoulder of the jar.

It seems to me that exhibitors who show guppies in half-filled jars are taking an unfair advantage over those exhibitors who keep to the rule. Although it is a minority who disobey the rule I believe that the practice is on the increase. They should not be allowed to get away with it.

• • •

No one can say that I have not presented the case for more consideration to be given to non-members who are willing to exhibit at open shows. I thought that the feasibility of this was emphasised at Manchester by the fact that there were 14 entries from non-members. Perhaps this sizeable entry will sway committees organising future open shows to make them shows open to all and sweep away the out-dated closed-shop approach.

• • •

A good idea when you are arranging rocks in a set-up tank is to place a slate or slab of stone directly below the spot at which food is added to the tank. Then, when dried foods are given, uneaten particles will in the main fall on to this. They can easily be removed from this position with a dip tube after the fish have finished feeding.

This neat exhibit of guppies in small planted tanks was staged by the Federation of Guppy Breeders Societies at the Three Counties Show at Reading recently

Floor to Ceiling Fish Display in Bradford

WHEN PETFISH MONTHLY visited Bradford in April Keith Barraclough showed us over his new shop, which was then in the process of being fitted out. In June all was ready for the opening and now no. 568 Great Horton Road is fully operational. One of its most impressive features is the banking of 160 tropical tanks in six rows from floor to ceiling on either side of the main sales area. The total height here is 13 ft., and the tank staging is arranged so that servicing of the tanks is done from behind, the upper three tiers being reached from mezzanine floors at the rear. These upper tanks are used as stock tanks and for the maturing of water. All the tanks are stainless steel (Metaframe), lengths 12 in., 18 in., 24 in. and 36 in., each individually heated, and controlled in pairs by one thermostat. Fluorescent lights are fitted over all the tanks. Plastic drain pipes run close to all the tanks in the service gangways.

In the shop's basement is the coldwater section, complete with a small ornamental pond. The fishes here are in 14 large plastic pools. Above the sales area on the first floor is the wholesale department and stockroom for equipment etc. and there is also a specially insulated room with its own heating system in which fishes bagged up for despatch, and their packing boxes, can be kept at the correct temperature until the time for them to be sent off.

Top picture: one of the two main banks of stainless-steel aquaria on each side of the sales area. Supporting wooden uprights are 3 in. by 3 in. and the cross members are 3 in. by 2 in.

Middle picture: the service gangway behind the bank of aquaria has every facility for easy tank cleaning and maintenance

Left: view towards the glass-fronted office at the rear of the shop, from the sales area

Growing Fish to Maximum SIZE

Environmental factors that influence the size reached by an aquarium fish are discussed in continuation of last month's article

By F. N. GHADIALLY, M.D., Ph.D., D.Sc.(Lond.)

FEEDING is one environmental factor affecting the size of our fishes, and this was discussed last month.

Swimming space is another important factor, and although generally it is true that for big fishes you need big tanks, a competent aquarist can grow fish to a pretty good size in small tanks.

To see how this can be done let us analyse why a large volume of water is preferable to a small one. At this stage we must bring in another factor—the surface area of the water. This is the place at which the water takes in oxygen and gives up excess of carbon dioxide. Since oxygen dissolved in the water is essential to the well-being and growth of fish and excess of carbon dioxide is detrimental it is obvious that a large surface area is an asset.

Actual figures for the number of square inches of water surface needed per inch of fish are somewhat fictitious and I do not intend to indulge in these. The fact is that when the amount of surface area per fish is grossly inadequate a state of acute distress results and the signs are pretty obvious. The fish swim about at the surface of the water 'mouthing air', for this is the zone where the maximum oxygen and minimum carbon dioxide concentrations occur. This phenomenon is virtually diagnostic of an overcrowded or polluted tank and can be readily recognised and suitable steps taken to remedy the situation.

Lesser degrees of oxygen lack are more difficult to diagnose and indeed the only sign may be a reluctance on the part of the fish to feed well and grow fast.

Aeration can, of course, soon clear up the trouble in mild cases. The stream of air released causes water from the depths of the tank to come to the surface; here it gives up the carbon dioxide and takes up oxygen. Then this oxygenated water moves downwards, its place again being taken by water from the depths of the tank. All the layers of water are adequately oxygenated and freed from excess of carbon dioxide, and the fish will now happily move to the middle and lower layers of water.

There is, however, something wrong about tanks maintained in this manner. It is to say the least a disturbing situation when life and health hang on the fickle performance of an aerator. This is not an indictment against aerators and aeration. There are some aquarists (purists!) who do not like to use aeration at all. They contend that competent hobbyists do not overcrowd their tanks and hence do not need aeration to keep the fish healthy.

It seems to me that to overcrowd tanks and then rely on aeration to keep the fishes healthy and happy is bad practice, but there is nothing wrong in using modest occasional bouts of aeration to move the water about and oxygenate the water thoroughly even in the deepest layers of the tank. Aeration used in this manner is no longer a necessity but something of a worthwhile luxury. Incidentally, it should be noted that continuous strong aeration with the resultant loss of carbon dioxide is likely to affect plant growth adversely.

Thus we can conclude that to keep fishes healthy and happy we must provide a large surface area of water per fish. Modest degrees of aeration have perhaps a beneficial and stimulating effect but we must not tolerate a situation where aeration becomes a necessity for survival.

Importance of Volume

Most aquarists are aware of the importance of the surface area of the water to fishkeeping but they tend to disregard or even belittle the need for a good volume of water. Nevertheless this is also an important factor, for in a small volume of water, however adequate the surface area might be, there is the likelihood of a rapid build-up of nitrogenous waste products. The excreta of fishes and snails, bits of dead plants, residual foods and occasional small dead fish are broken down by bacteria to produce soluble nitrates and other substances.

A reasonable concentration of organic and inorganic nitrogenous substances is not harmful to fish (indeed some of these are very necessary for plant growth), but if the volume of water is small the concentration of these substances can at the least provocation rise to dangerous amounts and adversely affect the health and growth of fishes. It is largely for this reason that beginners are recommended to start with a 24 in. by 12 in. by 12 in. tank and nothing smaller, for small tanks and goldfish globes become polluted far too easily. It needs expert knowledge to maintain fishes in small volumes of water.

Thus we see that soluble nitrogenous waste can

endanger the health and growth rate of fish. Three factors keep the concentration of these substances down: (1) a large volume of water; (2) plants or algae, which use up these substances; (3) partial changes of water.

The first point we have already commented on. Regarding the second point it is interesting that most professional and amateur fish breeders rear the majority of their fry in tanks free from gravel and plants. This, however, is largely a matter of convenience, for it is time-consuming and irritating to catch hundreds of fish in planted tanks. Nevertheless, once we have selected half a dozen or a dozen of the best fish for rearing to maximum size I think they should be moved to a large planted tank. It is important to note that only thriving and growing plants help to remove nitrogenous substances from the water. Plants that are standing still, slowly rotting, will completely defeat our purpose for they will be adding to the pool of nitrogenous waste in the tank.

With regard to the third point it is interesting that at one time old 'mature' aquarium water was considered a most precious commodity and attempts were made to conserve it as much as possible. Losses due to evaporation were made good by topping up but none was ever siphoned off and thrown away. Today, however, most people will agree that it is best to discard about a third of the tank water each week and top up with some fresh water. I firmly believe in this idea. It has an invigorating effect on plants and fishes alike and it helps to dilute and wash away both soluble waste products and mulm from the bottom of the tank.

Another environmental factor which affects the growth of fish is temperature. Many aquarists like to run their tanks at a fairly high temperature (80°F; 27°C) in the belief that a higher temperature means a faster metabolic rate and a more rapid rate of growth. There are, however, some who point out that higher temperatures also mean less dissolved oxygen, and further, constant high temperatures weaken the fish and render them susceptible to many ailments.

Obviously species difference are important. For instance, angels are happy at 80°F or even a bit more, particularly if steps are taken to provide some aeration and the water is maintained in a crystal-clear condition. On the other hand, White Cloud Mountain minnows will not do too well and may even die prematurely if maintained at such temperatures for prolonged periods.

Diurnal fluctuations in temperatures are also considered beneficial. Many aquarists believe that there is no point in setting your thermostat to give a differential of ±¾°F. Much better to have a differential of 2 or 3°F, which saves a considerable amount of wear and tear of the thermostat contacts and provides the desired fluctuation of temperature for the fishes.

On the whole it seems to me that one can rear first-class fish over a fairly wide range of temperature and that accurate control of this factor is not of primary importance. Most tropicals do well with the thermostat switching on at about 74°F (23°C) and switching off at about 78°F (25°C).

The last environmental factor we must consider is light. In an attempt to grow fishes faster and bigger aquarists have tried to extend the feeding time by extending the light hours. I have used lamps partially submerged in the water and switched on continuously to hasten the growth rate of fry. There is no doubt in my mind that during the first few weeks of the life of fry it is beneficial to keep the light on and let the fry feed throughout the day and night. On such a regime, when abundant supplies of Infusoria and brine shrimps are available, one can grow fry at an amazing pace, far in excess of that mentioned in books.

Later on little benefit can be derived from this, for it becomes difficult to provide food for the larger fishes throughout the night.

Readers' Queries Answered

Gravel and Hardness

I wish to breed tropical fish, one of the most important factors in the success of which seems to be water hardness. I have access to ion-exchange resins and can fill the tank with water of the required hardness provided I can obtain lime-free gravel.

The gravel most commonly supplied for aquarium use gives rise to so little dissolved solids in contact with soft water as to make no difference to its use for fish breeding. The aim is to use water with a low content of total dissolved solids, but complete absence of such solids is not required and would not be compatible with the state of the water in which fishes naturally breed.

The washing of gravel with dilute hydrochloric acid will decrease the likelihood of lime salts coming from it subsequently, but it is necessary to wash acid-treated gravel very thoroughly after the treatment or it will retain acid properties for some time.

Annual Fish

I am a beginner in aquarium-keeping and I do not understand what is meant by 'annual fish', referred to in recent articles. Can you enlighten me?

This is a phrase that is used in connection with a group of the egg-laying toothcarps whose life-span naturally is only about a year's duration. Their life is geared to their existence in pools that form only during the rainy season in their native South America. African species of *Aphyosemion* are subjected

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What's New?

Tank Divider

MOST aquarists feel the need to be able to divide off one end or half of an aquarium at some time or another, to part squabbling fish, to separate males from females before breeding, to keep big ones away from little ones, to rail off plants from plant-eaters and so on. Hykro have met this need with their new **Aquarium Separator**.

The boxed kit consists of two 12 in. plastic channels with wide flanges to rest opposite one another against the side glasses, where they are held in place by stainless steel clips supplied to fit over the top frame of the aquarium. Also in the kit are the sheet of perforated plastic that slides into channels to form the dividing partition and two narrow plastic strips to fit on the top and bottom edges of the partition.

Three sizes are available: (1) small, 7⅞ in. by 9½ in.; (2) medium, 9½ in. by 11⅞ in.; (3) large, 11⅞ in. by 11⅞ in. The perforated partition can be cut to any special size by the use of a hot knife. Its perforations are about $\frac{1}{32}$ in. holes, 36 to the square inch, which allows for water circulation from heaters and filters between the compartments. Price is 9s.

Division of a tank with the perforated plate of the new Hykro kit

Water Plant List

AS the non-specialist aquatic suppliers seldom keep stocks of all the wide range of water plants available, postal buying has become well established. The new Catalogue of Water Plants by Tachbrook of Victoria gives every aid to the customer, grouping about 150 plants according to leaf types, showing drawings of plants and giving both scientific and common names, as well as prices.

Filter Media

SAVING by bulk-buying is the temptation being offered to users of synthetic wools for filters. The well-known **Suresynth** nylon wool is now available in bulk packs said to be the equivalent of ten small packs at 18s.

From Inter-Pet there is being distributed a pillow-sized pack of Dacron Polymer wool, the **Jumbo** pack, at 30s.

Fry Pipe

THIS is not used for calling the youngsters at feeding time, nor is it something for children to learn to smoke with. It is, however, shaped something like a smoker's pipe but is made of Pyrex glass and is used in the manner of a dip tube for picking up small fish fry and transferring them from one tank to another. It can also be used for the close examination of a small fish temporarily held in it. Keith Barraclough is offering these at 5s 6d each.

Hykro Air Pump

ON show at the Pet Trade Fair this year for the first time was Hykro's **Reciprotor** piston pump, a massively made job of impressive design that looks as if it is really at home in the nuclear age. On the stand of Joe Grassby there was a display aquarium containing an unbelievable number of air outlets of all types served by the Reciprotor and yet there was still so much reserve that a leak line had to be kept open. Price of this one when it is imported from Denmark is not yet known.

The Reciprotor pump and an aquarium loaded with aerating and 'special effects' appliances for the purpose of demonstrating the pump's large output

BREEDER'S NOTEBOOK

With Eggs that Hang in Clusters

By J. LEE

THE lamp-eyes (*Micropanchax macrophthalmus*) are very striking little fish when in good condition though the colouring is difficult to describe. I would say it has a warm greenish blue through the body and the blue-green horizontal stripe when reflected in the right light is quite breath-taking. The lamp-eye is not a common fish. It is a member of the panchax group (Cyprinodontidae).

The outstanding feature of this particular fish is, of course, the eyes, which seem to glow just as their name indicates like two small lamps. In a well shaded tank with a dark background they appear to shine all the more to a lovely warm glowing blue, which really sets this trim little fish off. They have been said to be finnippers but I have never experienced this. The length of full grown adults is only 1 to 1½ inches and the ones I spawned were only just 1 inch long.

Sexing is easy enough, especially when breeding time is near. The anal fin on the male is deeper than that of the female and his pectoral fins are long and pointed. The head of this species is small and pointed, in the manner of a pike, and there is a small dorsal fin on the back towards the tail. The belly is whitish or silver, which coloration extends to most of the forward part of the fish. The caudal fins on both male and female are again small and round.

My experience in the early days of keeping the lamp-eyes is that they are not bottom fish. I used to feed them near the surface with the aid of small worm feeders. For conditioning them for breeding they were fed on a liberal supply of *Daphnia* and *Cyclops*, small white worms and Grindal worms.

For my first attempt with these fish I used a 20 in. by 10 in. by 10 in. tank, well washed out and placed in a position in the fish house where it did not get too much light. An 8 in. depth of water was used in the tank; it contained some very old water and this was just topped up (a depth of about 1 in.) with fresh tap water. To this was added half-a-teaspoon of sea salts. This was allowed to stand and settle for a week. At the time of checking, the temperature was 75°F (24°C). With regard to the pH, I have no record of this and there was no water hardness test at the time that was easily available to aquarists.

In the interior of the tank small bunches of *Cryptocoryne* and *Cabomba* were placed towards the back. In the centre was placed Indian ferns, floating on the surface, with nice young white roots trailing just halfway down the tank. The top was also shaded with *Riccia* (a ½ in. layer) and hornwort and *Myriophyllum* were placed at the sides of the tank.

The spawning took place, not with a pair but with a group of six that contained four females and two males. They were put into the tank at dusk and fed right away on red *Daphnia*. Soon the spawning began. After a few days had gone by the females were seen to be carrying eggs attached to them in small clusters at the vent, with an appearance that at first glance reminded me of miniature frog spawn. This procedure went on for hours. As the females swam near the surface and through the centre of the tank the eggs were brushed off in the *Riccia*, on the trailing roots of the Indian ferns and in the *Cabomba*. As far as I could tell this procedure went on all through the spawning period from time to time, because when one cluster of eggs was released on the plants another cluster would eventually appear.

At this stage the tank is a very unusual sight. The eggs are all over the tank suspended from the plants by what appear to be tiny fragile threads, only just visible to the naked eye. You might say the eggs looked as though they were hanging from fine spiders' webs. One thing I noticed while looking at them through a magnifying glass—the threads were not of even length; some were short, only ¼ in. to ½ in., and some longer, about ½ in. to ¾ in. The eggs are quite visible to the eye, even without a glass. The incubation period was 10 to 14 days and as they had been spawned over a period of 2 weeks, the fry began to hatch in relays. In batches near the front of the tank, some eggs were clear while one or two were developing the embryo.

During the whole 2 weeks while spawning took place the parent fish were never seen to touch any eggs. They simply ignored them. A nice sight was to see the fry hanging from the plants right through the tank, and from the *Riccia* at the top, and this made a complete change from the usual sight of fry all over the glass sides and top and bottom. As the first few fry appeared the breeders were taken out for a rest.

Because the fry were of various ages the Infusoria feeding was more prolonged than usual. The advanced fry were taking brine shrimp after a few days and in the second week some were able to take microworms—then on to Grindal worms and sifted *Daphnia* and, as a tit-bit, the yolk of an egg, until eventually they were able to take larger foods and worms such as white worms and *Tubifex* and large *Daphnia*.

A very interesting point arises with the lamp-eyes—that is whether the spawn is fertilised when carried through the plants, where it is hung on threads, because whether the spawn is showing on the female or not the male is constantly by her side.

Coloured Plants for the Aquarium

By C. D. ROE

Cryptocoryne wendtii de Wit

THIS species is both attractive and easy to grow in all of the four distinct forms that occur. It has been more recently introduced than other species of *Cryptocoryne* and the form first described by Prof. H. C. D. de Wit has dull green to olive-green leaves, oval in shape with sharply pointed tips when grown above water. When this form is grown below water it is paler in colour and the leaves are much longer. Maximum height is 6 inches.

The second form is brown in colour and rather smaller; above water the leaves are rich beown with slightly darker striations and when submerged the slightly longer leaves are also paler. The third form, found in Ceylon, has narrower leaves that are bright mid-green when growing above water and paler green as well as much longer and narrower than any other form when growing under water. It has been named *angustifolia*.

A distinct fourth form of *Cryptocoryne wendtii* is rather smaller than the others, with brownish leaves having distinctive purplish striations and purplish undersides when grown above water. Although the leaves retain these markings when grown below water they tend to be of a golden shade. Since this form is so much smaller it has been called *minima*.

PETFISH MONTHLY visits

Mr David Barker

CHATTERIS is a small town in the midst of the Fen country with historic associations going back to the tenth century. Some traces of its past are preserved close to the house in which Mr David Barker lives, but there is nothing that's antique or old-fashioned about the Honeysome Aquatic Nursery that he operates in another part of Chatteris.

Here the main feature is a 40 ft. by 20 ft. fish house that he designed, built and equipped almost entirely by his own labour over a period of about 8 months in 1965/'66. The visitor entering the house finds himself in the darkened central avenue, about 8 ft. wide, lined on each side by three tiers of bright windows that are in fact the display aquaria. There are 132 of these, 18 in. and 24 in. tanks both being used, and the general effect is most successful.

Although apparently completely walled-in at the front, access to the tanks can be had through the sliding doors fitted above each one. Fishes chosen by customers are netted through these openings but normal tank servicing is done from behind the rows in the service areas at each side of the fish house.

Daylight illuminates these areas, and the display tanks, through a double-glazed roof, and fluorescent lights are also fitted for after-dark use. Against the walls of the

By
ANTHONY EVANS

Sliding panels above each aquarium allow fish to be caught when necessary from the 'customer side' but the whole bank of tanks has a neat 'walled-in' appearance when the openings are not in use

Views of the interior of Mr David Barker's fish house. On the left is the appearance of one side of the normally darkened hall and the right picture is of the day-lighted work area behind the aquaria

building within the service areas stand Mr Barker's breeding and stock tanks, and at the time of my visit about 30 species were being produced. Three hundred or so varieties are normally kept in stock, however.

Mr Barker told me that the water supply available is a hard one, with the temporary hardness (due mainly to dissolved bicarbonates) being particularly high, and in some of his tanks he uses this water diluted 1 : 1 with clean rain water. All the display tanks are fitted with undergravel filters, no separate form of aeration being used with these. The gravel in the tanks was of an attractive and unusual appearance, and Mr Barker explained that this was a refractory material he has supplied to him that cannot add to the water's hardness. For his stock tanks large and external filters, made to his own design from plastic boxes, are used in conjunction with wide air-lift tubes served by a powerful air compressor.

A breeding or, rather, a rearing tip that Mr Barker passed on concerned his method of raising young half-beaks. These he finds do best in neutral water that is only about 1 inch deep in the tank, and he uses newly hatched brine shrimps as food for the half-beak fry.

Outside his fish house Mr Barker has ample space to extend and increase his range of ponds for coldwater stock, which he is planning to do, and the fish house itself has been made with provision for further extensions to form a tropical pool section and a water plant nursery in the future. Reptiles, too, are likely to be seen at Chatteris as the Nursery expands, for these have a great personal interest for Mr Barker.

I visited this modern fish house in the Fens before the arrival of summer but I could see the attractions the area would have for aquarists looking for a day out. Mr Barker told me he welcomes visits by clubs to Honeysome Nursery, and for wives and children he has made a garden space to rest and play in when they have seen all they want to see.

Lucky GUESS

GUESSING the number of fish in a set-up tank is not a new idea for a competition, but a first prize of a free holiday for two in the U.S.A. is certainly out of the usual run. This is what was won by Mr and Mrs Jack Wilson of North Shields for their estimate of the fish in a tank on the stand of Inter-Pet at this year's British Pet Trade Fair. Their trip included a visit to Canada for Expo '67, visits to aquarium shops in New York and Boston and, of course, a tour around the Metaframe Corporation's factory.

Club News

THIS YEAR **BURTON A.S.** were the host society in the inter-society show between themselves, NOTTINGHAM & D. A.S. and DERBY & D. A.S. Results were:

Anabantids: 1, Mrs Elliot (73, Derby); 2, Mr F. Warburton (71, Derby); 3, Mrs B. Scrimshaw (70, Nottingham). Barbs: 1 and 2, Mr K. Rielly (74 and 70, Nottingham); 3, Mr J. Stanton (68, Derby).

Livebearers male: 1, Mrs B. Scrimshaw (77, Nottingham); 2, Mr Morley (70, Derby); 3, Mrs B. Goodliffe (69, Nottingham). Livebearers female: 1, Mr B. Scrimshaw (76, Nottingham); 2 and 3, Mr J. Hunt (72 and 70, Burton).

Catfish and loaches: 1, Mr D. Kendrew (72½, Derby); 2, Mr B. Scrimshaw (72, Nottingham); 3, Mr H. King (70, Burton). Danios, rasboras, minnows: 1, Mr K. Rielly (80, Nottingham); 2, Mr J. Hunt (79, Burton); 3, Mr K. Rielly (78, Nottingham). Characins: 1, Mr J. Stanton (70, Derby); 2, Mr K. Reilly (75, Nottingham); 3, Mr B. Scrimshaw (70, Nottingham). Killiefish: 1, Mr B. Scrimshaw (77, Nottingham); 2, Mr R. Walker (76, Burton); 3, Mr B. Scrimshaw (75, Nottingham). Cichlids up to 3 in.: 1, Mr B. Morrell (78, Derby); Mr B. Scrimshaw (73, Nottingham); 3, Mr E. Gee (68½, Nottingham). Cichlids over 3 in.: 1, Mr B. Morrel (75, Derby); 2, Mrs B. Scrimshaw (73, Nottingham); 3, Mr K. Binns (72, Nottingham).

Goldfish variety: 1, Mr C. Hill (75, 68, 67, Nottingham). A.o.v. coldwater: 1 and 2, Mr B. Forman (75, 70, Burton); 2, Mr C. Hill (74, Nottingham).

Final results (points) were: Nottingham, 67; Derby, 33; Burton, 20.

WILLESDEN A.S. were the hosts at the May meeting of the NORTH WEST LONDON GROUP OF AQUARIST SOCIETIES and about 70 members and friends heard a very fine talk given by Mr David Marlborough of the British Ichthyological Society.

The best fish in show award went to Mr T. Glass (Willesden) for a *C. severum* and final placings were: Independent 49, Willesden 35, Riverside 21, Hendon 9, Hampstead 6.

Detailed results were:

Swordtails: 1, Mr E. Lloyd (Independent); 2, Mr F. Cuffell (Independent); 3, Mr Buchan (Riverside); 4, Mr A Scudder (Independent). Characins: 1 and 4, Mr J. Kettle (Independent); 3, Mr T. Glass (Willesden); 3, Mr Buckland (Riverside). A.v. labyrinths except fighters: 1, Mr T. Glass (Willesden); 2, Mr F. O'Connell (Hendon); 3, Mr Buckland (Riverside); 4, Mr S. Tarrant (Willesden). Cichlids: 1, 2 and 3, Mr T. Glass (Willesden); 4, Mr Buckland (Riverside).

THE THREE-day open show held by **BRISTOL TROPICAL FISH CLUB** at the end of June was a tremendous success and the club would like their thanks to judges and exhibitors alike to be recorded. The best fish in show award went to Mr M. Locke for his bleeding heart tetra and Mr F. Brown was awarded the highest points. Detailed results were:

Siamese fighting fish. 1, Mrs C. King; 2, Mrs M. Holland; 3, Mr E. Newman; 4, Mrs L. Stone; 5, Mr M. Holland. **Labyrinths (excluding fighters).** 1, Mrs C. King; 2, Mr P. Wright; 3 and 5, Mr D. Cronin; 4, Mr A. Hinks; 6 and 7, Mr J. Wheeler.

Barbs. 1 and 2, Mr F. Brown; 3, Mr C. Calway; 4, Mrs C. King; 5, Mr A. Hinks; 6, Mr R. Toone, 7, Mr A. Rogers. **Hemigrammus and Hyphessobrycon.** 1, Mr M. Locke; 2 and 3, Mr A. Ibbertson, 4, Mr M. Taylor; 5, Mr F. Brown; 6, Mrs C. King; 7, Mr S. Allaway. **Characins.** 1 and 6, Mr R. Webb (*Leporinus* and *A. anostomus*); 2, Mr M. Burt (Congo characin); 3, Mr E. Newman (*A. anostomus*); 4, Mr C. Gorwill (red-eye characin); 5, Mr F. Brown (cardinal tetra); 6, Mr R. Webb (*A. anostomus*); 7, Mr P. Wright (black widow).

Angels. 1, Mr P. Wright (black lace); 2, 5 and 7, Mr E. Newman; 3 and 4, Mrs C. King, 6, Mr J. Evens. **Dwarf cichlids.** 1 and 7, Mr P. Wright (*P. bribensis*); 2 and 6, Mr J. Powell (*P. bribensis*); 3, Mr J. Evens (*Nannacara*); 4 and 5, Mr B. Cornish (*A. reitzigi*). **A.o.v. cichlids.** 1, Severum Mr N. Bindings (*C. Setzerum*); 2, Mr F. Brown (*Geophagus*); 3 and 7, Mr C. Gorwill (pike cichlid and *Filamed*); 4, Mr J. Evens (blue acara); 5 and 6, Mr E. Verender (blue acara and firemouth).

Corydoras catfish. 1, Mr L. Littleton; 2, Mr P. Wright; 3 and 4, Mr T. Phipps; 5, Mr J. Wheeler; 6, Mr F. Brown; 7, Mr. M. Tiley. **A.o.v. catfish.** 1, Mr F. Brown (tiger catfish); 2, Mr J. Evens (*Synodontis*); 3, Mrs C. King (*Pimelodella*); 4, Mr J. Wheeler (glass catfish); 5, Mrs I. Stone (*Synodontis*); 6, Mr D. Pluck (upsidedown catfish); 7, Mr A. Gibson (*Pimelodella*).

A.v. danios. 1, Mr F. Brown; 2, 3 and 4, Mr C. Calway. **A.v. sharks and loaches.** 1, Mr E. Newman (redtailed shark); 2, Mr M. Locke (redtailed shark); 3, Mr P. Wright (redtailed shark); 4, Mr J. Powell (*Botia almorhae*); 5, Mr E. Newman (silver shark); 6, Mr J. Powell (sucking loach); 7, Mr D. Quick (grey loach). **A.o.v. egglayers.** 1 and 3, Mrs H. Cronin (knife fish and striped knife fish); 2, Mr R. Hemmings (American flag fish); 4, Mr M. Locke (*A. australe*); 5, Mr. M. Locke (Siamese tiger); 6, Mr F. Brown (lyretail); 7, Mr D. Quick (knife fish).

Mollies. 1, Mr M. Locke; 2 and 4, Mr J. Wheeler; 3, Mr J. Powell; 5, 6 and 7, Mr D. Cronin. **Swordtails.** 1, 3 and 7, Mr L. Littleton; 2, Mr A. Gibson; 3, Mr D. Quick; 4, Mr T. Green; 6, Mrs H. Cronin. **Platys.** 1, Mr B. Lewton; 2, Mr E. Newman; 3 and 6, Mr A. Rogers; 4, Mr D. Quick; 5, Mr C. Bubb; 7, Mr T. Tiley.

A.o.v. livebearers. 1, Mr D. Counsell. **Breeders egglayers.** 1, Mr M. Locke (*A. australe*); 2, Mrs C. King (tiger barbs); 3, Mr J. Powell (blue acaras); 4, Mrs C. King (angels); 5 and 7, Mr D. Quick (*Leeri* gourami and *P. bribensis*); 6, Mr B. Lewton (dwarf gourami). **Breeders livebearers.** 1, Mr L. Littleton; 2, Mr F. Barry; 3 and 4, Mr J. Wheeler; 5, Mr F. Brown; 6, Mrs C. King; 7, Mr A. Ibbertson. **Guppies (long tail).** 1, 6 and 7, Mr J. Wheeler; 2, Mr A. Rogers; 3 and 5, Mr D. Counsell; 4, Mr C. Bubb. **Guppies (short tail).** 1 and 2, Mr H. C. B. Thomas; 3, Mr M. Taylor. **Guppies (female).** 1 and 4, Mr B. Clarke; 2 and 6, Mr J. Wheeler; 3, Mr F. Brown; 5, Mr C. Bubb; 7, Mr M. Taylor.

A.v. sexed pairs. 1, Mr E. Newman (blue acaras); 2 and 6, Mr L. Littleton (*Pterophyllum limantus* and red swords); 3, Mr M. Tiley (angels); 4, Mr B. Lewton (*A. australe*); 5, Mr M. Locke (*Chriopeops goodei*); 7, Mr R. Hemming (red tuxedo swordtails).

A.v. egglayers (juveniles). 1, 3 and 7, S. Allaway (*P. bribensis* and paradise fish); 2 and 4, T. Phipps (Corydoras catfish); 5, P. Wheeler (African knife fish); 6, P. Felaki (Buenos Aires tetra). **A.v. livebearers (juveniles).** 1, P. Holland (sunset platy variatus); 2, 6 and 7, P. Felaki (swordtail black molly, guppy); 3, Miss P. Holland (green swordtail); 4, C. Newman (red swordtail); 5, P. Wheeler (green sailfin molly).

Individual furnished aquaria. 1, Mrs P. Wright; 2, Mr L. Littleton.

THE BRITISH KILLIEFISH ASSOCIATION *are staging their second International Killiefish Show at Bingley Hall, Broad Street, Birmingham under the auspices of the* **M.A.P.S. MIDLAND OPEN SHOW** *on the 23rd–26th August. New secretary of the Midland Aquatic Show Committee, Mr. J. Witts, 120 Franklin Road, Kings Norton, Birmingham 30 tells us that at this, the 24th MIDLAND OPEN, there will be 97 classes, trade stands, exhibits and displays to delight the hobbyist.*

ILFORD & D.A. & P.S. held its annual general meeting on 12th June and a successful and interesting year was reported, with membership up and income higher than expenditure. Officers for the year are: president, Mr V. Price; chairman, Mr A. Stebbing; secretary, Mr R. Ruth (13 Dunkeld Road, Dagenham, Essex); treasurer, Mr M. Brill; show secretary, Mr H. Berger and Press secretary, Mr Smith. Two new committee members Mr and Mrs Woodley were also elected.

During the Redbridge Arts Festival held in May, the society took part in an exhibition by the Arts and Crafts section at Selfridges, Ilford. The main feature of the club's stand was a square illuminated kiosk showing 12 small planted tanks; a large carboy, used as a table lamp, planted with *Cryptocorynes* and displaying a selection of veiltailed guppies, attracted a great deal of attention. The club were very grateful to Wade Aquatics who loaned all the equipment and literature on view.

Plans for the coming months include a criss cross quiz in August, an auction in September, a talk by Mr A. Leutscher in October, and further lectures and a film show in December. The society meets at 8.0 p.m. on the second Monday of each month at St. Laurence's Church Hall, Donington Avenue, Barkingside, Ilford, and in addition to the main event of the evening, table shows are held from March to October providing classes for all

varieties of tropical and coldwater fish. The secretary will be delighted to give further details to prospective new members.

ENTRIES from 29 societies were received at the open show organised by **MIXENDEN T.F.S.** who really appreciated the support given to them in this way. The show was judged by Mr F. Taylor of Burnley and Mr P. Moorhouse of Huddersfield. Mr Ken Parkes of Merseyside won the best fish in show award with a tinfoil barb.

Guppies: 1, Mr Johnson (Stockport); 2, Mr Baring (Bradford); 3, Mr Mawson (Worksop). Swordtails: 1, 2 and 3, Mr F. Ledger (Huddersfield). Platys: 1, Mr Foley (Salford); 2, Mr Wood (Halifax); 3, Mr Birch (Heywood). Mollies: 1, J. & H. Dernie (Worksop); 2, Mr D. Kennedy (Bradford); 3, Mr Breedon (Barnsley).

Barbs (up to nigger barbs): 1 and 2, J. & H. Dernie (Worksop); 3, Mr Stray (Halifax). Over nigger barbs: 1, Mr K. Parkes (Merseyside); 2, Mr Wilkinson (Halifax); 3, Mr F. Ledger (Huddersfield).

Characins. Small: 1, Mr Wilbraham (Ouram); 2, J. & H. Dernie (Worksop); 3, Mr W. Booth (T.A.B.). Medium: 1, Mr Price (Gorton & Openshaw); 2, Mr Whyte (Halifax); 3, Mrs B. Cohen (Pontefract). Large: 1, Mr J. Robinson (Merseyside); 2, Mr Whiteley (Aireborough); 3, J. & H. Dernie (Worksop).

Cichlids: Dwarf: 1 and 2, J. & H. Dernie (Worksop); 3, Mr Thomalla (Merseyside). A.o.v.: 1, Mr L. Thompson (Mixenden); 2, Mr A. Cass (Macclesfield); 3, Master D. Ledger (Cornbrook). Angels: 1, Mr Woodward (Blackpool); 2, Mr Booth (T.A.B.); 3, Mr Longbottom (Mixenden).

Toothcarps: 1, Mr Wood (Barnsley); 2, Mr Breedon (Barnsley); 3, Mr Beasley (Ouram). Fighters: 1, Mr Jones (Valley); 2, Mr Booth (T.A.B.); 3, Mr Smith (Tadcaster). A.o.v. anabantids: 1, Mr Price (Gorton & Openshaw); 2, Mr Beasley (Ouram); 3, J. & H. Dernie (Worksop).

Sharks and flying foxes: 1, Mr Willan (Valley); 2, Mr Shilla (Merseyside); 3, Mr Thomalla (Merseyside). Danios, minnows and rasboras: 1, Mr Thomalla (Merseyside); 2, J. & H. Dernie (Worksop); 3, Mr Naylor (Aireborough). Catfish and loaches: 1, Mr G. Hodgkinson (Gorton &

Jim Kelly (left) in discussion with a visitor to the Show in front of the award rosettes

A series of display panels (right) gave full background information for guppyors

World Record Guppy Entry at Manchester

ARDWICK GREEN at Manchester was again the venue of the second **FANCY GUPPY ASSOCIATION** International Guppy Show on 4th June, where the T.A. Drill Hall provided a light and spacious setting for the exhibits. Entries (over 600) of fish constituted a guppy show world record; fish came from all sections of the Association, home and oversea (but not from the U.S.A.). In the centre of the hall a colourful series of display panels arranged by the F.G.A.'s indefatigable chairman Jim Kelly, showed how the guppy gets its name, where it came from originally, features of fish anatomy and function, examples of news publicity the guppy has had through the years, the story of evolution (complete with a working 'evolution clock'—one swing of the pendulum equal to 27,606 years!) and F.G.A. organisation. Other informative exhibits explained the star award system. A demonstration of commercial and home-made brine shrimp hatching was a popular feature.

Among entries from oversea were some from Kenya sent by the distinguished palaeontologist Dr L. A. Leakey. Although these entries were in transit for nearly 72 hours all arrived safely and some were winners of awards. The entry awarded the highest points (a wedge female) was entered by Mr H. Stuttard (85 pts, gold star). The best breeders entry came from Mr V. Partington (84 pts, gold jewelled award). The best male entry award went to the guppy submitted by Mr Fowles & Mr Vinal (82 pts, silver star).

Detailed results are as follows (points awarded in brackets; initials refer to gold jewelled award, gold star and silver star): delta: 1, Mr Goodall & Mr Montilla (76, GJ); 2, Mr V. Partington and Mr P. J. Duffy (both, 73); 4, Mr V. Partington (74). Long dorsal veil: 1, Mr Fowles & Mr Vinal (82, SS); 2 and 4, Mr V. Partington (80, 76); 3, Mr P. J. Duffy (78). Short dorsal veil: 1 and 2, Mr V. Partington (77 GJ, 76); 3, Mr T. Hallett (75); 4, Mr G. Goodall (74). Fan: 1, Mr V. Partington (73); 2, Mr J. Hesketh (72); 3, Mr Atkins (67); 4, Mr Goodall & Mr Montilla (66). Flag/scarf: 1 and 2, Miss J. Peet (73, 70); 3, Mr R. D. Groot (69).

Lyre: 1, Dr Leakey (60); 2, Mr K. Rigby (52); 3, Mr P. Clarke (49). Top sword: 1, Mr L. Mason (72); 2, Mr K. Clark (67); 3, Mr P. Scott (64). Double sword: 1 and 2, Mr K. Rigby (76, 73); 3, Mr Beresford & Mr Jeffery (73). Lower sword: 1, Mr K. Rigby (78); 2, Mr T. Hallett (74); 3, Mr W. H. Cook (73).

Colour: 1, Mr R. Young (75); 2 and 4, Mr V. Partington (74, 71); 3, Mr R. V. Brotherwood (73). A.o.v. male: 1 and 2, Mr V. Partington (75 GJ, 74); 3, Mr A. Wallace (73). Short tail: 1, Mr Byelong & Mr Jenstins (75 SS, 71); 2, Mr Beresford & Mr Jeffery (75 GJ).

Superba female: 1, Mr D. Curry (77 GJ); 2, Mr Goodall & Mr Montilla (75); 3, Mr Beresford & Mr Jeffery (73); 4, Mr A. Wallace (71). Scallop female: 1, Mr R. Clarke (76 SS); 2, Mr Goodall & Mr Montilla (73); 3, Mr B. Preston (65). Wedge female: 1, Mr H. Stuttard (85 GS); 2, Mr W. Holmes (78); 3, Mr R. Clarke (76); 4, Mr G. Goodall (71). Original: 1, Mr G. Goodall (84 GJ); 2, Mr D. Curry (83); 3, Mr K. Rigby (82); 4, Mr R. Clarke (76). A.o.v. female: 1, Mr B. Hawkins (75, SS); 2, Mr Fowles & Mr Vinal (72); 3, Mr Beresford & Mr Jeffery (71); 4, Mr K. Clark (70).

Breeders males: 1 and 2, Mr V. Partington (84 GJ, 80); 3, Dr Atkins (79); 4, Mr P. J. Duffy (78). Breeders pairs: 1, Mr Goodall & Mr Montilla (80 GJ); 2, Mr J. Heap (77); 3, Mr Prothereo & Mr Turner (75); 4, Mr A. Wallace (74). Breeders females: 1, Mr G. Goodall (82 GJ); 2, Mr Fowles & Mr Vinal (80); 3, Mr W. Collyer (79); 4, Mr D. Curry (78). Master breeders: 1, Mr G. Goodall (80 GJ); 2, Dr Atkins (77); 3, Mr D. Curry (75). Novice breeder: 1, Mr K. Edwards (74 SS); 2 and 4, Mr B. Main (73, 71); 3, Mr E. B. Greenland (72.) Junior breeders: 1, Miss J. Peet (69); 2, J. Stuttard (68); 3, H. Stuttard (67); 4, L. Beaves (54).

Ladies: 1 and 2, Miss J. Peet (76 SS, 74). Juniors: 1, B. Webster (76 SS); 2, P. Stuttard (73); 3, P. Hodkinson (72); 4, B. Forsyth (70).

Openshaw); 2, J. & H. Dernie (Worksop); 3, Mr Butterworth (Valley).

Breeders egglayers: 1, Mr W. Booth (T.A.B.); 2, Mr Stray (Halifax); 3, J. & H. Dernie (Worksop). Breeders livebearers: 1 and 2, J. & H. Dernie (Worksop); 3, Mr Smith (Tadcaster). Pairs egglayers: 1, Mr Thomalla (Merseyside); 2, Mr Crosty (Cornbrook); 3, Mr Ellias (Valley). Pairs livebearers: 1, Mr Mawson (Worksop); 2, Mrs Preston (Belle Vue); 3, J. & H. Dernie (Worksop).

A.o.v. tropical: 1, Mr Dewhirst (Halifax); 2, Mr D. Cohen (Pontefract); 3, Mr W. Booth (T.A.B.). A.v. tropical or coldwater, children's class: 1, D. Ledger (Cornbrook); 2, A. Middleton (Gorton & Openshaw); 3, C. Longbottom (Mixenden). A.v. coldwater 1 and 2, Mr Phillipson (B.A.F.); 3, Mr Brown (Bradford).

THE SUCCESS of the **CATFORD A.S.** open show held at the beginning of June, which members felt was the best ever to be staged by the club, was due in no small measure to the excellent layout, with sufficient gangway space throughout, and to the general presentation. Much credit for this must go to Inter-Pet of Dorking who lent the Metaframe stainless steel aquaria in which all the fish were housed. The tanks were quite leak-free and uniform in size and gave a very pleasing appearance to the show, which the 1000 spectators were quick to comment upon. A large compressor was used to supply aeration where needed and the coldwater classes were aerated throughout. The show was judged by Mr Creed, Mr Esson and Mr Mealand and several F.B.A.S. Gold Stars were awarded. Also present was Dr J. N. Carrington of Inter-Pet, Mr Ted Jessopp and other F.B.A.S. personalities and members of the G.L.C.

The best fish in show award went to Mr R. J. Thorne (Hounslow). The winner of the Killiefish trophy was Mr Bill Challenger of the B.K.A. The F.B.A.S. Championship breeders team award went to Mr D. C. M. Durrant (Thurrock A.S.) and the Olive Cup for the best fancy goldfish went to Mr Iles (Catford A.S.). The inter-club challenge shield was retained by the home team with 78 points.

Part of the display of stainless-steel aquaria used at the Catford A.S. Open Show

A SPECIAL award is to be offered at the National Open Fish Show sponsored by **NOTTINGHAM & D. A. S.** *(9th and 10th September) for junior exhibitors for the best exhibit in any class that is submitted by a junior (under 16 years of age). Judging of the 96 classes will be undertaken by Mr Holmes and Mr C. Walker (F.N.A.S., A.Y.A.S.) and by Mr W. Webley (F.N.A.S., F.B.A.S., G.S.G.B.).*

LYTHAM A.S. staged their first annual open show on 11th June and found they had a resounding success on their hands. Local interest was so stimulated that many new members were signed up on the spot, and there were 425 entries of tropical fish from societies all over the country. The show was opened and the prizes presented by the club's president, Mr Jim Kelly, who also vastly entertained competitors and general public alike with a lecture and answers to questions. Other attractions were numerous trade stands, a tombola stand and a continuous film show and magic act specially for the children. The best fish in show award went to Mr Ken Parkes (Merseyside).

Livebearers. Section winner, Mr Johnson (Stockport). Guppies: 1, Mr Johnson (Stockport); 2 and 3, Mr W. Orton (Salford). Mollies: 1 and 3, Mr F. Woodward (Blackpool); 2, Mr C. Jones (Blackpool). Swordtails: 1, 2 and 3, Mr F. Ledger (Huddersfield). Platys: 1, Mr R. Tadds (Bedworth); 2, Miss B. Kaye; 3, Mr C. Jones (Blackpool). A.o.v. 1, 2 and 3, Mr P. Reynolds (Swillington).

Characins. Section winner, Mr J. Robinson (Merseyside). Up to 2 in.: 1, Mr W. Parkin (T.A.B.); 2, Mr D. Thomalla (Merseyside); 3, Mr B. Rowbotham (Macclesfield). Over 2 in.: 1, Mr J. Robinson (Merseyside); 2, Mr F. Mulla (Merseyside); Mr W. Smith (Merseyside).

Barbs and minnows. Section winner, Mr K. Parkes (Merseyside). Up to 3½ in.: 1, Mr Stray (Halifax); 2, Mr D. Thomalla (Merseyside); 3, Mr J. Taylor (Blackpool). Over 3½ in.: 1, Mr K. Parkes (Merseyside); 2, Mr W. Parkin (T.A.B.); 3, Mr E. Fletcher (Glossop). Minnows: 1 and 2, Mr D. Thomalla (Merseyside); 3, Miss B. Kaye.

Cichlids. Section winner, Mr D. Thomalla (Merseyside). Angels: 1, Mr F. Woodward (Blackpool); 2, Mr C. Jones (Blackpool); 3, Mr P. Whelan (Blackburn). Dwarf: 1, Mr D. Thomalla (Merseyside); 2, Mr F. Mulla (Merseyside); 3, Mr H. Pickup. Large: 1, Mr M. Fiddler (Glossop); 2, Mr I. Jones (Bury); 3, Mr R. Moorcroft (Merseyside).

Anabantids. Section winner, Mr W. Matthews (Lytham). Fighters: 1, Mr J. Sutton (Ossett); 2, Mr B. Tate (Nelson); 3, Mr D. Thomson (Lytham). A.o.v.: 1, Mr W. Matthews (Lytham); 2, Mr E. Fletcher (Glossop); 3, Mr J. Wyke.

Catfish, loaches and labeos. Section winner, Mr K. Parkes (Merseyside). A.v. catfish: 1, Mr W. Parkin (T.A.B.); 2, Mr F. Mulla (Merseyside); 3, Mr L. Kaye. A.v. loach: 1, Mr K. Parkes (Merseyside); 2, Mr J. Shaw (Ossett); 3, Mr G. Hodgkinson (Gorton). A.v. labeo or shark: 1, Mr C. Jones (Blackpool); 2, Mr D. Johnson (Stockport); 3, Mr D. Thomalla (Merseyside).

Egglaying toothcarps. Section winner, Mr J. Boardman (Leigh). A.v. toothcarp: 1, Mr J. Boardman (Leigh); 2, Mr K. Townsend (Lytham); 3, Mr G. Hodkinson (Gorton).

A.o.v. tropical. 1, Mr Mr W. Parkin (T.A.B.); 2, Mr R. Brothwood (Leigh); 3, Mr P. Reynolds (Swillington).

Breeders' tropical. Section winner, Mr J. Shaw (Ossett). Egglayers: 1, Mr J. Shaw (Ossett); 2, Mr M. Stray (Halifax); 3, Mr K. Hamblett (Warrington). Livebearers: 1, Mrs R. Standon (Lancs); 2, Mr J. Shaw (Ossett); 3, Mr D. Grundy (Leigh).

Pairs tropical. Section winner, Mr W. Parkin (T.A.B.). Egglayers: 1, Mr W. Parkin (T.A.B.); 2, Mr D. Thomalla (Merseyside); 3, Mrs R. Standon (Lancs). Livebearers: 1, Mr R. Brothwood (Leigh); 2, Mr J. Shaw (Ossett); 3, Mr G. Hodkinson (Gorton).

Coldwater. Section winner, Mr R. Birch (Heywood). Fancy goldfish: 1 and 3, Mr R. Birch (Heywood); 2, Miss C. Brothwood (Leigh). A.v. coldwater: 1, Mr A. Kaye.

OVER 200 hobbyists exhibited more than 340 fish at the **PONTEFRACT & D. A.S.** open table show. Judges were Mr J. M. Skinner and Mr D. Dunford (F.N.A.S., A.Y.A.S.) and all section winners received trophies with small prizes for second and third places. The best in show award went to J. & H. Dernie of Worksop for a beautiful *Apistogramma reitzigi*.

Detailed results were: Guppies: 1, Mr G. Nash (Pontefract); 2, Mr A. Beasley (Ossett); 3, Mr P. Barritt (Bradford). Platys: 1, Mrs Barry (Swillington); 2, J. & H. Dernie (Worksop); 3, Mr T. Tranter (Pontefract). Mollies: 1, J. & H. Dernie (Worksop); 2, Master L. Lacey (Aireborough); 3, Mr L. M. Todd (Independent). Swords: 1, Mr H. Candlow (Thorne); 2 and 3, Mr F. Ledger (Huddersfield).

Barbs: 1, J. & H. Dernie (Worksop); 2, Mrs Barry (Swillington); 3, Mr Bean (Snaith). Characins: 1, Mr Stringer (Swillington); 2, Mr Tonge (Rochdale); 3, Mr W. Hutteson (Snaith). Cichlids: 1, 2 and 3, J. & H. Dernie (Worksop). Danios and rasboras: 1, Mrs B. Cohen (Pontefract); 2, Mr L. Kaye (Huddersfield); 3, Mr A. Powell (Thorne).

Anabantids: 1, Mr R. M. Faircliffe (Tadcaster); 2, Mr P. Barritt (Bradford); 3, Mr J. Woodhead (Huddersfield). Fighters: 1, Mr Mawson (Worksop); 2, Mr D. Breedon (Barnsley); 3, Mrs B. Cohen (Pontefract). Catfish and loach: 1, Mr G. Nash (Pontefract); 2, Mr P. Barritt (Bradford); 3, Mr B. Helm (Horsforth). Toothcarps: 1 and 2, Mr A. Wood (Barnsley); 3, Mr A. Powell (Thorne). A.o.v.: 1, Mr P. Reynolds (Swillington); 2, Mr Bean (Snaith); 3, Mr P. Barritt (Bradford).

Breeders livebearers: 1 and 2, J. and H. Dernie (Worksop); 3, Mr Stringer (Swillington). Breeders egglayers: 1 and 2, Mr W. Booth (T.A.B.); 3, J. & H. Dernie (Worksop). Pairs livebearers: 1, Mr Mawson (Worksop); 2, Mr G. Nash (Pontefract); 3, J. & H. Dernie (Worksop). Pairs egglayers: 1, Mr W. Booth (T.A.B.); 2, Mrs Burrup (Keighley & Aireborough); 3, Mr J. Howard (Barnsley).

Coldwater: 1, 2 and 3, Mr F. B. Hill (Thorne). Furnished jars: 1 and 3, Mrs Batty (Swillington); 2, Mr Stringer (Swillington).

ANNUAL members night of the **AIREBOROUGH & D. A.S.** was attended by 41 members who found

the occasion very enjoyable and instructive. A panel of experts was on hand to answer questions about fishkeeping and Mr P. Reynolds, the table show judge, was most helpful in giving entrants reasons why their fish had or had not won.

Table show results were:

1, Chadwick cup (livebearers): 1, Mr C. J. Burnap; 2, Mr J. Whiteley and Master D. Lacey; 3, Mr J. Whiteley. R. E. Hampson cup (barbs): 1, Mr J. Whiteley; 2, Mr Flesher; 3, Mr K. Bateman. P. Watts cup (characins): 1, Mr K. Bateman; 2, Mr J. Whiteley; 3, Mr P. Iveson.

G. D. Groom cup (cichlids): 1, Master D. Lacey; 2, Mr J. Whiteley; 3, Mr K. Bateman. Walker cup (anabantids): 1, Mr R. Lister; 2 and 3, Mr P. Joyce. J. Dickinson cup (a.v. pairs): 1, Mr C. J. Burnap; 2 and 3, Mr B. Megson. Hallas cup (a.o.v.): 1, Mr K. Emms; 2, Mr J. Whiteley; 3, Mr C. J. Burnap.

B. Crowson cup (catfish and loach): 2, Mr P. Iveson; 2, Mrs D. Burnap; 3, Mr K. Bateman. Junior cup (a.v. junior): 1, Master K. Lister; 2 and 3, Master D. Lawson. B. Helm cup (a.v. novice): 1, Mr B. Megson; 2, Mrs P. Iveson; 3, Mr S. Grest.

Furnished mini-jars (no fish): 1, Mr B. Megson. Best fish in show (K. Emms cup): 1, Mr R. Lister.

AT the annual general meeting of **STOCKTON-ON-TEES A.S.** the following officers were elected: chairman, Mr D. Keighley; vice-chairman, Mr A. Stevenson; secretary, Mr W. Bowman, (2 Seaton Close, Fairfield, Stockton-on-Tees, Co. Durham); treasurer, Mr J. Andrews; show secretary, Mr J. Chamberlain; committee members, Mrs B. Clennett, Mrs S. Smith, Mr E. Yorke, Mr K. Clennett and Mr D. Clarke. The plaque for the year's points championship was awarded to Mr J. Chamberlain.

At this meeting a table show was held featuring all the fish that had received first and second place awards in the previous year. Results were: 1, Mr and Mrs K. Clennett; 2, Mr W. Bowman; 3, Mr and Mrs K. Clennett.

Membership now stands at 79; prospective new members should contact the secretary for further information.

SOUTH WALES and West of England societies. **NEWPORT A.S.** *are interested in competing in inter-club tables on a 'home and away' basis. The society has already competed against Barry, Cheltenham and Keynsham (Bristol) and although beaten by Barry were successful against the other two. Societies interested in participating in such competitions, and within reasonable travelling distance of Newport, are asked to contact Mr M. J. Parry, 45 Western Drive, Gabalfa, Cardiff.*

ASLAS Show

THIS year's **ASLAS** Show was held last month at Hounslow, and over 200 entries were benched by the nine participating societies.

A.v. mollie: 1, Mr K. Dryden; 2, Mr Hart; 3, Mr A. Flemming. A.v. sword: 1, Mrs L. J. Thorne; 2 and 3, Mrs M. Moore. A.v. platy: 1, Mr F. Glynn; 2, Mr C. Walker; 3, Mr G. Greenhalf. A.o.v. livebearer: 1, Mr R. Cooper; 2 and 3, Mrs L. J. Thorne. A.v. egglaying toothcarp: 1 and 2, Mr D. W. Ellis; 3, Mr E. Sheppard. Danios, rasboras and White Cloud Mountain minnows: 1, Mr Hart; 2, Mr R. J. Thorne; 3, Mr R. Biggs. A.v. barb: 1 and 2, Mr R. J. Thorne; 3, Mrs L. J. Thorne. A.v. characin: 1, Mr D. W. Ellis; 2, Mrs L. J. Thorne; 3, Mr R. Biggs. A.v. fighter: 1, Mr A. Tucker; 2, Mr C. Fellerman; 3, Mr A. Flemming. A.o.v. labyrinth: 1 and 2, Mr A. Tucker; 3, Mrs Brewer. A.v. *Corydoras*: 1, Mr R. Biggs; 2 and 3, Mr R. J. Thorne. A.o.v. tropical catfish: 1 and 2, Mr G. Greenhalf; 3, Mr D. W. Ellis. A.v. tropical loach or botia: 1 and 3, Mr R. Cooper; 2, Mr G. Greenhalf. A.v. cichlid: 1 and 2, Mr R. J. Thorne; 3, Mr C. Fellerman. A.o.v. tropical egglayer: 1, Mr B. J. Abbott; 2, Mr G. Greenhalf; 3, Mr A. Flemming. Tropical breeder's livebearers: 1, Mr R. Cooper; 2, Mr R. Biggs; 3, Mrs L. J. Thorne. Tropical breeder's egg-layers: 1 and 2, Mr Hart; 3, Mr E. Sheppard. Individual tropical furnished aquarium: Mr E. Sheppard. Individual miniature furnished tank: 1, Mr R. Biggs; 2, Mr A. Hastings; 3, Mr D. Dudley. Individual coldwater furnished aquarium: Mr and Mrs R. Dudley and son. Common goldfish: 1, Mr W. Leach; 2, Mr F. Glynn; 3, Mr I. Flintham. A.v. shubunkin: 1 and 2, Mr W. Leach; 3, Mr and Mrs R. Dudley and son. A.o.v. fancy goldfish: 1, Mrs S. Flemming; 2, Mr F. Glynn; 3, Mr W. Leach. Coldwater breeders: 2, Mr Leggett. A.v. plant: 1, Mr A. Flemming; 2, Mr and Mrs R. Dudley and son; 3, Mr G. Greenhalf. Trophy winners: Mr A. Flemming (best pair of livebearers; best pair of mollies); Mr W. Leach (best coldwater fish); Mr Hart (best tropical breeder's team); Hounslow & D. A.S. (Inter-Club Shield; highest club points-tropical); Redhill & Reigate A.S. (highest club points—coldwater). Best fish in the show: sooty widow (Mr R. Cooper). Judges were Mr R. Esson, Mr H. Tuvell and Mr M. Thomas.

'Club furnished table' example by Hounslow A.S. of entry invited for their show on 16th September. Supplied: table and two tanks; entrant arranges display and ingenuity can win cash awards

Mr John Thorne, chairman of Hounslow A.S. checking the trophies at the ASLAS Show

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THE **FEDERATION OF GUPPY BREEDERS SOCIETIES** open show (held in conjunction with the THREE COUNTIES 13th annual show) got off to a bad start because traffic congestion into Reading delayed the arrival of many F.G.B.S. members coming from the Midlands and other points north and east. However, once they had assembled thanks to the efforts of the Three Counties Group show secretary, Mr Claude Masters, benching of the 124 entries went ahead at a record rate. Mr Pete Merritt (Three Counties) had the highest pointed guppy, an excellent cofertail, 79 points, which earned him a silver pin. Other pin winners were Mr F. D. Hall, Mr R. G. Cox and Mr A. Wilkinson. Class winners were:

Cofertail, Mr P. Merritt; topsword; Mr P. W. Jinks; coloured veils, Mr F. D. Hall; black veils, Mr P. W. Jinks; scarftail, Mr A. Wilkinson; triangletail, Mr F. D. Hall; fantail, Mr F. D. Hall; gold female, Mr P. W. Jinks; albino female, Mr R. G. Cox; coloured female, Mr A. Wilkinson; wedge-tail, female, Mr F. D. Hall; metropolitan female, Mrs L. D. Smith; breeders males, Mr A. Wilkinson; breeders females, Mr A. Wilkinson; a.o.v. Mr T. Duffy. Judges were Mrs L. D. Smith and Mr Pearce, Mr Delingpole, Mr Erroy, Mr Wilkinson and Mr Jinks.

266 ENTRIES were benched at the second Open Show of the **FREE-LANCE AQUARIST SOCIETY** held at the London College of Printing, Elephant and Castle, London, and these, together with the exhibition by the BRITISH KILLIEFISH ASSOCIATION, gave an impressive show. In addition, the FANCY GUPPY ASSOCIATION held an Open Show, in which there were 46 entries. There were two lectures given during the afternoon, the first by Dr Cust, and the second by Dr Carrington.

Results were as follows: Best fish in the show, a giant Australian rainbow entered by Mrs J. A. Dunstan. A.v. platy or swordtail: 1, (Marigold platy), Mr G. Greenhalf; 2, (red platy) Mr F. E. T. Smith; 3, (red

platy). Mr B. Challenger; 4, (marigold platy) Mr G. Greenhalf. A.v. mollie: 1, (black sail-fin), Mr J. Thorne; 2, (veilifera) Mr T. H. West; 3, (veilifera), Mr T. Brown; 4, (veilifera) Mr S. C. Jones.

A.v. barb: 1, (*B. schuberti*) Mr J. J. Coleman; 2, (*B. oligolepis*) Mr J. J. Coleman; 3, (nigger barb) Mr F. H. Vicker; 4, (tiger barb) Mr D. Valverde. A.v. characin: 1, (*N. tri*[*fasciatus*) Mr E. Keep; 2, (Dragon fin) Mr T. Payne; 3, (red nose tetra) Mr B. Pearson; 4, (*Laporinus striatus*) Mr E. Keep. A.v. cichlid: 1, (brown acara) Mr E. Keep; 2, (fire-mouth) Mr K. Dryden; 3, (blue acara) Mr F. E. T. Smith; 4, (*P. guentheri*) Mr A. Jamieson. A.v. danio, rasbora, minnow: 1, (*R. saravacahensis*) Mr R. Biggs; 2, (*R. saravacahensis*) Mr R. Biggs; 3, (harlequin) Mr W. Wren; 4, (giant danio) Mr A. Lovett. A.v. toothcarp, killiefish: 1, (*Rivulus dorai*) Mr T. Payne; 2, (*L. australe*) Mr B. J. Pawley; 3, (*Nothobranchius rachovi*) Mr B. Challenger; 4, (*Epiplatys sexfasciatus*) Mr R. Christou.

A.v. Corydoras cat: 1, (Corydoras sp.) Mr S. C. Jones; 2, (*C. lepinu*) Mr R. Biggs; 3, (*C. treitli*) Mr P. Trask; 4, (*C. punctatus*) Mr R. Biggs. A.o.v. catfish: 1, (*albino Clarias*) Mr J. Thorne; 2, (*Microglanis*) Mr J. Thorne; 3, (armoured cat) Mr B. Stewart; 4, (albino *Clarias*) Mr A. Jamieson.

A.v. fighter: 1, (Red fighter) Mr Durrant; 2, Mr Marshall. 3, (blue fighter) Mr Durrant. A.o.v. labyrinth: 1, (dwarf gouramy) Mr G. B. Bass; 2, (thick-lip) Mr M. J. King; 3, (thick-lip) Mr C. Statham; 4, (moonlight gouramy) Mr F. E. T. Smith. A.o.v. tropical: 1, (giant Australian rainbow) Mr Durston; 2, (redtailed black shark) Mr D. Chennells; 3, (black shark) Mr G. Greenhalf; 4, (silver shark) Mr W. Wren.

A.v. coldwater: 1, (shubunkin) Mrs W. Voysey; 2, (goldfish) Mr Voysey; 3, (common eel) Mr B. Stewart. A.v. rooted plant: 1, (*Ludwigia*) Mr V. P. Voysey; 2, (Amazon sword) Mr Marshall; 3, (*Sagittaria sinensis*) Mr T. Asquith; 4, (*Cryptocoryne*) Mr T. Asquith.

Breeders tropical egglayers: 1, (red fighters) Mr Durrant; 2, (*Epiplatys dageti monrovia*) Mr N. W. Snelling; 3, (emperor tetras) Mr F. H. Vicker; 4, (rosy barbs) Mr S. C. Jones. Breeders tropical livebearers: 1, (veilifera mollies) Mr F. E. T. Smith; 2, (tuxedo swords) Mr B. Clare; 3, (veilifera mollies) Mr T. H. West; 4, (red eyed red swords) Mr C. Fisher. Individual furnished aquaria: 1, Mr J. Stewart; 2, Mr T. Beasley.

AT the third annual open show held by **LLANTWIT MAJOR A.S.** fish were exhibited from Bath, Bristol, Keynsham and Trowbridge clubs and the South Wales clubs were represented. Some very good fish were on show among the 300 entries judged by Dr C. W. Cole (Birmingham), Mr C. Lewis (Newport and Mr J. Wheeler (Bradford-on-Avon). The cup for the best furnished tank was presented to Mrs Burgwin (Newport). Plaques were won by Mr W. Gorwell (award for best egglayer entry, Cardiff), Mr A. Rogers (best livebearer award, Lantwit), Mr F. Hall (best breeders egglayer, Didcot), Mr R. Wigg (best breeders livebearers and best guppy, Llantwit). A plaque was also won by Mr F. Brown of Bristol for the highest number of points.

Class results were:

Siamese fighters: 1, Mrs King (Bristol); 2, Mr Smithson (Bridgend); 3, Mr A. Ibbertson (Llantwit). A.v. labyrinths: 1, Mrs King (Bristol); 2, Mr Pearse (Llantwit); 3, Mr J. Sanders (Llantwit); 4, Mr M. J. Parry (Newport). *Hemigrammus*: 1, Mr A. Ibbertson (*Llantwit*); 2 and 4, Mr D. R. Johns (Llantwit); 3, Mrs King (Bristol). A.o.v. characin: 1 and 2, Mr F. Hall (Didcot); 3, Mr D. Songhurst (Llantwit); 4, Mr N. Counsell (Cardiff). A.v. barbs: 1, Mr A. Ibbertson (*Llantwit*); 2, Mr A. Rogers (Llantwit); 3 and 4, Mr F. Brown (Bristol).

Male guppies: 1 and 3, Mr R. Wigg (Llantwit); 2, Mr N. Counsell (Cardiff); 3, Mr F. Hall (Didcot). Female guppies: 1, Mr F. Brown (Bristol); 2 and 4, Mr D. Songhurst (Llantwit); 3, Mr R. Wigg (Llantwit). Platys: 1, Mr A Rogers (Llantwit); 2, and 4, Mr R. Wigg (Llantwit); 3, Mr T. Phipps (Barry). Swordtails: 1 and 3, Mr L. Littleton (Bristol); 2, Mr M. J. Parry (Newport). Mollies: 1, Mr P. Harris (Cardiff); 2 and 4, Mr C. Barber (Bridgend); 3, Mr C. Smithson.

Catfish and loaches: 1, Mr S. Nelson (Llantwit); 2, Mr P. Harris; 3, Mr F. Brown (Bristol). *Corydoras* catfish: 1, 3 and 4, Mr T. E. Phipps; 2, Mr P. D. Wright. Dwarf cichlids: 1, P. D. Wright; 2, Mr D. Songhurst (Llantwit); 3, Mr C. M. Barber. A.o.v. cichlids: 1, Mr W. Gorwell (Cardiff); 2, Mr D. J. Mann (Cardiff); 3, Mr F. Hall (Didcot); 4, Mr R. Wigg (Llantwit).

Danios and rasboras: 2 and 3, Mr F. Hall (Didcot); 2, Mr E. M. Clark (Barry); 4, Mr G. Loagher (Bridgend). Killiefish: 1, Mr F. Brown (Bristol); 2, Mr Counsell (Cardiff).

A.o.v. egglayer: 1, Mr P. Player (Cardiff); 2, Mr P. Harris; 3, Mr G. Pearse (Llantwit). A.o.v. livebearer: 1, Mr N. Counsell (Cardiff). Breeders livebearers: 1, Mr R. Wigg (Llantwit); 2, Mr F. Brown (Bristol); 3, Mr A. Ibbertson (Llantwit). Breeders egglayers: 1, Mr F. Hall (Didcot); 2, Mr G. Pearse (Llantwit); 3, Mrs King (Bristol). Breeders guppies: 1 and 2, Mr M. J. Main (Newport); 3, Mr J. Burgwin (Newport); 4, Mr R. Wigg (Llantwit). Furnished aquaria: 1, Mrs Burgwin (Newport); 2, Mr S. Nelson (Llantwit).

In Brief . . .

. . . NOT only the shape and colours of the fishes to be found in Lake Victoria but also their taste was described by Mr R. L. Welcomme in his talk to **HARLOW A.S.** in June. Mr Welcomme is well known for his work on the *Tilapia* genus and has had the *Haplochromis welcommei* named after him. The 44 club members present, and visitors from WITAM A.S. and HARWICH A.S., saw Mr Welcomme made an honorary member of Harlow A.S.

. . . ABOUT 40 members of **MIDHERTS A.S.** enjoyed the film show given by Mr Mason Smith of Cambridge, and there were 72 entries for this meeting's livebearer table show, which was judged by Mr Dixon. At two recent inter-club shows, the society narrowly beat HENDON by 4 points, who avenged this table show defeat by winning a quiz held while the fish were being judged by Mr Brown. The other challenged club was DUNSTABLE, beaten by a good margin on their home ground.

. . . FOLLOWING the announcement in the May issue of PFM to fishkeepers in the North interested in rearing and showing tropical or coldwater marines fishes and invertebrates, a meeting was held at which the **NORTHERN MARINE ASSOCIATION** was formed. Officers elected for 1967–68 are: chairman, Mr E. Price; secretary, Mr M. P. Glover, 15 Charleston Close, Crete St. Estate, Oldham, Lancs; treasurer, Mr A. Harper; vice-chairman, Mr I. McLoy; show secretary, Mr R. Victoe; committee: Mr P. Moorhouse, Mr P. Howe, Mr G. Hodgkinson, Mr C. Walker. The Association is now applying for F.N.A.S. membership and anyone wishing to join this new group will be very welcome and should contact the secretary.

. . . A WELL attended meeting of the **LOYNE AQUARISTS** heard their chairman, Mr D. James, give his half-yearly report. New members were congratulated on their successes at open table shows and it was reported that the judging competition, held in conjunction with club table shows, had been most successful in training members to recognise the quality of fish entries. In the awarding of points, their decisions now followed very closely those of the official judges. A committee was formed at this meeting to be responsible for building a show stand for Belle Vue. New members, who are very welcome, should contact the secretary, Mr R. Holmes, 6 Kempton Road, Lancaster.

. . . AN ENTIRELY new club, the **BLACKBURN A.S.**, has now been formed. Meetings are held at the Knowles Arms, Plackgate, Blackburn on the second Wednesday of each month. A warm welcome is extended to all potential members, friends and all other clubs in the area and Mr Peter J. Whelan (109 Dunoon Drive, Shadsworth, Blackburn, Lancs), who signs himself at present 'Acting president, chairman, secretary, treasurer, etc. etc.' writes 'There's a great deal of interest up here in Blackburn and district so other clubs beware—we are after those major trophies!'

. . . WINNERS of the table show at the **HORSFORTH A.S.** second monthly meeting were: specified class (characins): 1, Mrs J. Dickinson. A.o.v.: 1 and 3 Mrs J. Dickinson; 2, Mr Marrill. A.o.v. junior: 1 and 3, Master P. Kirby; 2, Master

Pluse. Best in show: *Leporinus* belonging to Mrs J. Dickinson.

. . . AS EVERY keen club member knows, there are a great many jobs to be done in a thriving society, 'such as setting up displays at shows to keeping an eye on the hospital tanks', as the editor of the **COVENTRY POOL & AQUARIUM SOCIETY** newsletter puts it, that really cannot be coped with at ordinary committee meetings. So the society's committee are proposing the formation of a small project group which would have transport resorces, craft, skill and ideas and a place to work. Show stand heating and lighting are the first problems for the group to tackle.

. . . RESULTS of the table show for anabantids at **HALTON & D. A.S.** were: 1, Mr G. Clark; 2, Master D. Sharp; 3, Mr M. Taylor. Mr A. Parry won the livebearers pairs table show (2, Master D. Sharp; 3, Mrs O. Taylor). Beginners in the club were catered for in a talk by club secretary, Mr F. Senior, on tropical fishes suitable for the community tank; and another most enlightening talk was given by Mr R. Winterburn of Bradford on aquatic plants.

. . . THE inter-club table show between **NEWPORT A.S.** and KEYNSHAM (judge, Mr John Wheeler of Trowbridge A.S.) resulted in a win for Newport. A.v. egglayer: 1, Mr J. Burgwin (Newport); 2, Mr R. Hammond (Keynsham); 3, Mr W. Chapman (Newport) and Mrs A. King (Keynsham) A.v. livebearer: 1, Mr F. Brown (Keynsham); 2, Mr F. G. James (Newport); 3, Mr W. Chapman (Newport).

. . . DEALER and hobbyist relations received a real boost recently with the opening of Mr Keith Barraclough's new premises in Bradford. We hear that many **BRADFORD & D. A.S.** members helped to get the new shop ready in time, voluntarily giving up their spare evenings and sometimes working through to the early hours of the morning!

. . . **RIVERSIDE A.S.** were hosts at an interclub evening to ROEHAMPTON A.S. and WIMBLEDON A.S. in May. A most interesting lecture was given by Mr T. Ravensdale of the I.M.S.S. on marine fishkeeping. Mr C. F. Buckland of Riverside was the individual winner with a dwarf gourami (2, Mr G. Pocock, Riverside; 3, Mr T. Joyce, Wimbledon; 4, Mr L. Heffer, Roehampton). The winning club was Riverside (322 points; 2, Roehampton with 318; 3, Wimbledon, with 316).

. . . AT the second Spring Meeting of the **BRITISH AQUARIST STUDY SOCIETY (BASS),** held in the Lecture Hall of the Zoological Society, Dr Atkins lectured on genetics and fishkeeping, and spoke not only upon the theoretical laws and fundamentals of the subject but also gave many practical applications concerning tropical fish. Later, Mr Cluse of the Goldfish Society of Great Britain talked on the development of the fancy goldfish, and illustrated the talk with several excellent colour slides.

The next meeting of BASS will be on 7th October when it is hoped that Dr Stokoe will talk on diseases.

. . . MR Bower, F.N.A.S., judged the second inter-club table show between **HUCKNALL & BULWELL A.S.** (who were the hosts). MANSFIELD A.S. and RAINWORTH A.S. Results were: Danios and rasboras: 1, E & R. Stockdale (Mansfield, white cloud, 86); 2 and 3, Mr R. Day (Rainsworth, spotted danios, 81 and 78). Cichlids: 1, Mr C. Mason (Mansfield, orange chromide, 84); 2, Mr I. Talbot, (Hucknall, Jack Dempsey, 83); 3, Mr G. Wanless (Hucknall, blue acara, 80). Barbs: 1, Mr I. Talbot (Hucknall, tiger barb, 84); 2, Mr G. Mason (Mansfield, ember barb, 81); 3, Mr A. Cornell, (Rainworth, rosy barb, 75).

. . . FIVE new members and over 100 entries in the table show made the June meeting of the LIVERPOOL SECTION of the **FANCY GUPPY ASSOCIATION** a bustling occasion. The Manchester partners, Mr Beresford and Mr Jefferys, won the gold medal for the best fish in show. Chairman Mr Ken Rigby gave the meeting a detailed description of the proposed standards for both the F.G.A. and F.G.B.S. shows.

. . . ALTHOUGH a lot of hard work is being undertaken by **HOUNSLOW & D. A.S.** to prepare for their next major event—the open show on 16th September—there is still time to enjoy the events arranged by social secretary Mr Bob Nelhams, such as the recent outing to 'The Sound of Music' in London and even to make plans for the annual dinner, now postponed from November to January 1968.

Table shows are also being well supported in general though the cold-water classes entries could receive greater support. Results of the barbs section were: 1, Mr Eric Sheppard; 2, Mr Barry Abbott; 3, Mr John Thorne. Coldwater: 1, Mr Barry Abbott; 2, Master Melvin.

. . . ALTHOUGH we cannot say how many people visited the Dudley Art Gallery to see the exhibition in which **DUDLEY & D. A.S.** took part, since the results of the club competition to guess the number of visitors have not yet been announced, club members worked very hard towards making the exhibition a success and should succeed in gaining a good number of new adherents to the hobby who saw the display of fish, plants and equipment.

. . . ALTHOUGH recent efforts have been centred round preparations for the annual show that was held at the beginning of July, table shows have been well supported by members of **BASINGSTOKE & D. A.S.** and recent results have been: A.v. tropical: 1, Mr D. Wall; 2, Mr J. Hildon; 3, Mr T. Errey. A.v. coldwater: 1, Mr A. Marshall; 2, Mr L. Lovegrove; 3, Mr E. Leavey. A.v. cichlid: 1, Mr A. Marshall; 2, Mr F. Lange; 3, Mr R. Ridley. An inter-club bottle show was held with HIGH WYCOMBE and PORTSMOUTH which resulted in High Wycombe obtaining 85 points, Basingstoke 47 and Portsmouth 38, and a very enjoyable evening was completed by a lecture given by Mr Wally Ryder on pond and river fish.

. . . A NEW meeting place is announced for **BRISTOL TROPICAL FISH CLUB.** The club will meet in future at the Black Horse Hotel, Midland Road (off Old Market Street), Bristol.

. . . AT the table show for a.o.v. tropicals **RUGBY & D. A.S.** member Mrs J. Smith took first place with a *Labeo bicolor* (2, Mr A. Whitmee, black ghost fish; 3, Mr A. Whitmee, reed fish; 4, Mr A. Whitmee, striped knife fish). Master B. Malin walked off with first, second and third places in the coldwater class. The furnished jar class award went to Mr T. Wood. At this meeting Mr Dudley Lucas (Leamington) gave a very interesting talk about unusual fish.

. . . TO emphasise the reported popularity of our hobby in the United States, we hear from **LONG BEACH A.S.** (California) that at their annual local Hobby Show their entry was the biggest of the 66 hobby societies and 120 individual entries that exhibited. This is a very big local event and over 42,000 visitors attended the show this year.

Readers' Queries Answered

Continued from page 178

to the same conditions. During the dry season the water evaporates and plant and fish life dies. But the eggs of *Cynolebias* and *Pterolebias*, for example, that have been laid in the pool rest in the mud until the rains come again. Whilst dried out in this way they have to resist quite high temperatures in the sun. In the space of a few weeks after the pools fill up the life-cycle of these genera must be completed. The eggs hatch, the fry grow extremely quickly and must mature and lay their own eggs before the pools dry out again. Although their life span is so short some of these fishes, such as *Cynolebias nigripinnis* and *C. bellotti*, are extremely beautiful, and since they can be spawned without too much difficulty a constant supply of replacements can be maintained. Under aquarium conditions they live longer than the 8 months or so available to them in natural pools.

Algae Eaters

Is there a fish that will keep down the thread algae in my tank?

Unfortunately neither thread algae nor the blue-green algae seem to be acceptable to any of the well-known algae-eaters. While sucking loaches, *Otocinclus* and *Plecostomus*, will clean the glass and plants of their matt covering of 'green' they are not attracted by the filamentous kind.

Peat Water

I put down peat in water, last year, but alas it is not crystal clear, but is a brown muddy colour. I used sedge peat and am wondering if Irish moss peat should have been used?

Peat water should be clear but it will have a brown colour. The type of peat used should not influence the end result too greatly and although the treated water is muddy in appearance, it could be used after filtration. A sample should be poured through a folded nylon cloth. If this does not clear it, then it will need to be kept for a longer period to flocculate, but it is usually possible to achieve clarity by filtration through a suitable type and thickness of nylon.

Aqua-tip

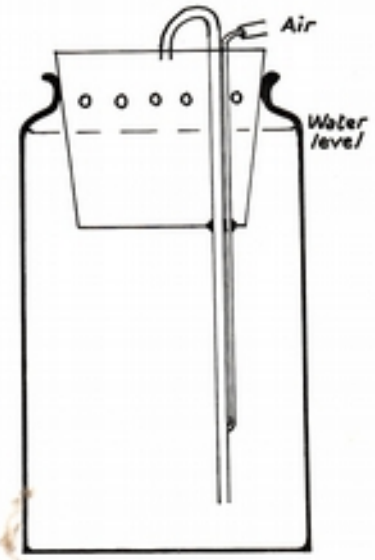
HAVING tried to keep *Tubifex* worms for a long time by the old method of keeping them under the water tap with a slow flow of water, and getting fed up with having to remove them every time somebody wanted to use the sink, or losing them all down the drain, I decided to make a worm-keeping gadget of my own.

In this, I have kept the same batch of worms for as long as 3 weeks, without losing a single worm, by merely changing the water every 2 or 3 days. All that is needed is an air-lift, a glass jar and a plastic container. For the last-named item I used one that is fairly generally obtainable, that is sold with yoghurt in it. This is a tapered container and so fits quite a number of different sized jars.

First, make a series of holes around the side of the plastic container so that they will come just above the water line in the jar, and also make one in the base of the plastic container to take the air-lift. This base hole must have the air-lift tube sealed in with polystyrene cement, to hold the air-lift in place and stop the worms from dropping through to the bottom of the jar. It is best to make the holes with a hot needle, as the plastic may split if drilled. The air-lift I used was from a corner filter. When the air-lift is being fixed to the plastic container, the outlet end should be kept down to as near the water level as possible as this ensures a better flow of water.

The *Tubifex* are put in the container, the jar is filled to the appropriate level and the container floated in the jar. The air-lift is then connected to the air pump.

R. J. DICKENS



Mr G. F. Smith

Mr A. F. Wilkinson writes:

Members of the aquarists' world will join with the members of the Guppy Breeders Societies in mourning the passing of 'George' Smith on 6th April, 1967. Latterly George has been virtually 'Mr J. & S.' but this by no means describes his career as an aquarist, administrator and friend. Like so many of us he graduated through the cold-water and tropical facets of the hobby and eventually became 'a one fish man', that fish, of course, being the guppy.

As far back as 1949 he was a well-known figure at the meetings of various London societies when, with his wife Ingrid, he 'did the rounds' of the various shows and meetings. In 1951 George took over the post of secretary of the Colindale club and here for the first time he showed his natural aptitude for this type of post.

In 1952 George and Ingrid were members of the 'Water Life' Show Committee and, backed by a first class new fish house, George and Ingrid became known throughout the length and breadth of the British Isles wherever the hobby flourished. It was about this time that the serious study and keeping of the guppy first attracted their attention and from then on George's progress was almost pre-ordained. In that year he joined the North London Guppy Breeders Society, which in turn soon became part of the Federation of Guppy Breeders and his career culminated in the award of the joint fellowship to Ingrid and himself in 1966.

During these 14 years George held a number of offices in the Federation but became best known for his secretaryship of the J. & S. Committee. This is the office he held up to the time of his death and it was almost entirely due to his efforts that this Committee exercised a benevolent despotism over the exhibitors and judges alike in the F.G.B.S. Additionally he and Ingrid put in many hours with the Federation Study Group, increasing our knowledge of the environment in which guppies thrive. Furthermore he assisted Ingrid in collating and making available to the Federation general translations of articles from the German.

As a man George was small physically but truly great in stature. To those of us who knew him well his outstanding attribute was that of patience. He never lost his temper, in public at any rate, and he was always ready to find extenuating circumstances for the frailty of others. He was kind, he was gentle, and above all he was extremely knowledgeable about the hobby and the personalities in it.

Coming so soon after the loss of George Phillips, with the death of George, the hobby has suffered two grave blows and the combined knowledge lost to us is very great. I personally have lost a good friend and gentle adviser and a staunch ally whenever George's sense of fitness or rectitude were assailed.

All our condolences go out to Ingrid, his wife, in her grievous loss and I especially would like to offer my own personal commiserations to her.

Dates for Your Diary

5–12th August. **PORTSMOUTH A.S.** fifteenth annual Open Show. Benching, 5th; judging, 6th; open to public 7–12th; prize-giving, evening of 12th.

13th August. **GORTON & OPENSHAW** third annual Open Show. Conservative Club, Gorton Lane, Manchester 18.

21st–26th August. **MIDLAND OPEN SHOW** (the 24th). Bingley Hall, Broad Street, Birmingham. Details from Mr J. Witts, 120 Franklin Road, King's Norton, Birmingham 30.

23rd–26th August. **BRITISH KILLIEFISH ASSOCIATION** Second International Killiefish Show (incorporated into the Midland Open Show—see above).

26–27th August. **HARLOW TOWN SHOW.** Details from Mr J. Duncan, 28 Long House, Bush Fair, Harlow, Essex.

26th and 27th August. **OSRAM A.S.** Two-Day Show.

2nd September. **HIGH WYCOMBE A.S.** annual Open Show. The Rye, High Wycombe, Bucks. This will include a guppy show put on by the THREE COUNTIES section of the **FEDERATION OF GUPPY BREEDERS SOCIETY.** Details from Mr C. E. Pike, 16 Ashley Drive, Tylers Green, Penn, Bucks.

2nd September. **FEDERATION OF BRITISH AQUATIC SOCIETIES** Assembly.

2nd September. **YATE & D. A.S.** first Open Trade Show. Schedules from show secretary Mr J. B. Powell, 124 Cranleigh Court Road, Yate, Glos.

3rd September. **NATIONAL JUDGES COURSE.** The Midland Association of Aquarists Societies are holding this course at Kingstanding, Birmingham, beginning on 3rd September. See advertisement in this issue.

3rd September. **REIGATE & REDHILL A.S.** first Open Show. Details from show secretary Mr G. Bass, 2 Caroline House, Rees Road, Redhill, Surrey.

9th and 10th September. **NOTTINGHAM & D. A.S.** National Open Fish Show, Drill Hall, Triumph Road, Nottingham. Schedules from Mr. W. J. Christian, 40 Moor Lane, Bunny, Notts.

10th September. **HUDDERSFIELD TROPICAL FISH SOCIETY** Fifth Open Show.

16th September. **HOUNSLOW & D.A.S.** Open Show, Bulstrode School, Hounslow, Middlesex. Trophies presented for first, second, third in all classes. Show schedules from Mr Ray Scurry, 49 Longford Avenue, Bedfont, Middlesex.

16th September. **NEWPORT A.S.** fifth Annual Open Show. Duffryn Junior High School, Newport.

17th September. **ATHERSTONE A.S.** second Open Show.

17th September. **STOCKPORT A.C.** Open Show.

17th September. **BRADFORD & D.A.S.** Second Open Show. Textile Hall, Westgate, Bradford 1.

23rd September. **AMERSHAM & DISTRICT A.S.** Open Show. Amersham Community Centre. Details and schedules from Mr K. North, 38 Holtspur Way, Beaconsfield, Bucks.

23rd September. **BRACKNELL & D. A.S.** Open Show. Victoria Hall, Bracknell, Berks. Details and show schedules from Mr B. Johnson, 18 Highfield Close, Cove, Farnborough, Hants.

24th September. **BLACKPOOL & FYLDE A.S.** annual Open Show, Harrowside Solarium, South Promenade, Blackpool.

24th September. **MEDWAY A.S.** Open Tropical Show. St. John Fisher School, Ordnance Street, Chatham, Kent. Schedules from Mr K. Brown, 5 Allison Avenue, Gillingham.

30th September. **KINGSTON & D. A.S.** Open Show. St. Luke's Social Centre, Elm Road, Kingston-on-Thames. Details from Mr H. Towell, 21 Belmont Terrace, Chiswick, W.4. Phone CHI 7335.

1st October. **HEYWOOD & D. A.S.** Open Show. Labour Club, Bridge Street (opposite the Seven Stars), Heywood, Lancs. Extra class for marines.

7th October. **MID-HERTS A.S.** Open Show. The Faulkner Hall, Victoria Street, St. Albans, Herts. Further information from Mr D. R. Lelliott, 19 Prospect Road, St. Albans.

13th October. **STONE A.S.** Open Show (provisional).

28th–29th October. **BRITISH AQUARISTS FESTIVAL** organised by the Federation of Northern Aquarium Societies, Belle Vue Zoological Gardens, Manchester.

11th November. **GOLDFISH SOCIETY OF GREAT BRITAIN** quarterly assembly.

26th November. **LEEDS & D.A.S.** Open Day Show. (Change of date).

3rd December. **FEDERATION OF BRITISH AQUATIC SOCIETIES** Assembly.

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Continued on page 194

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