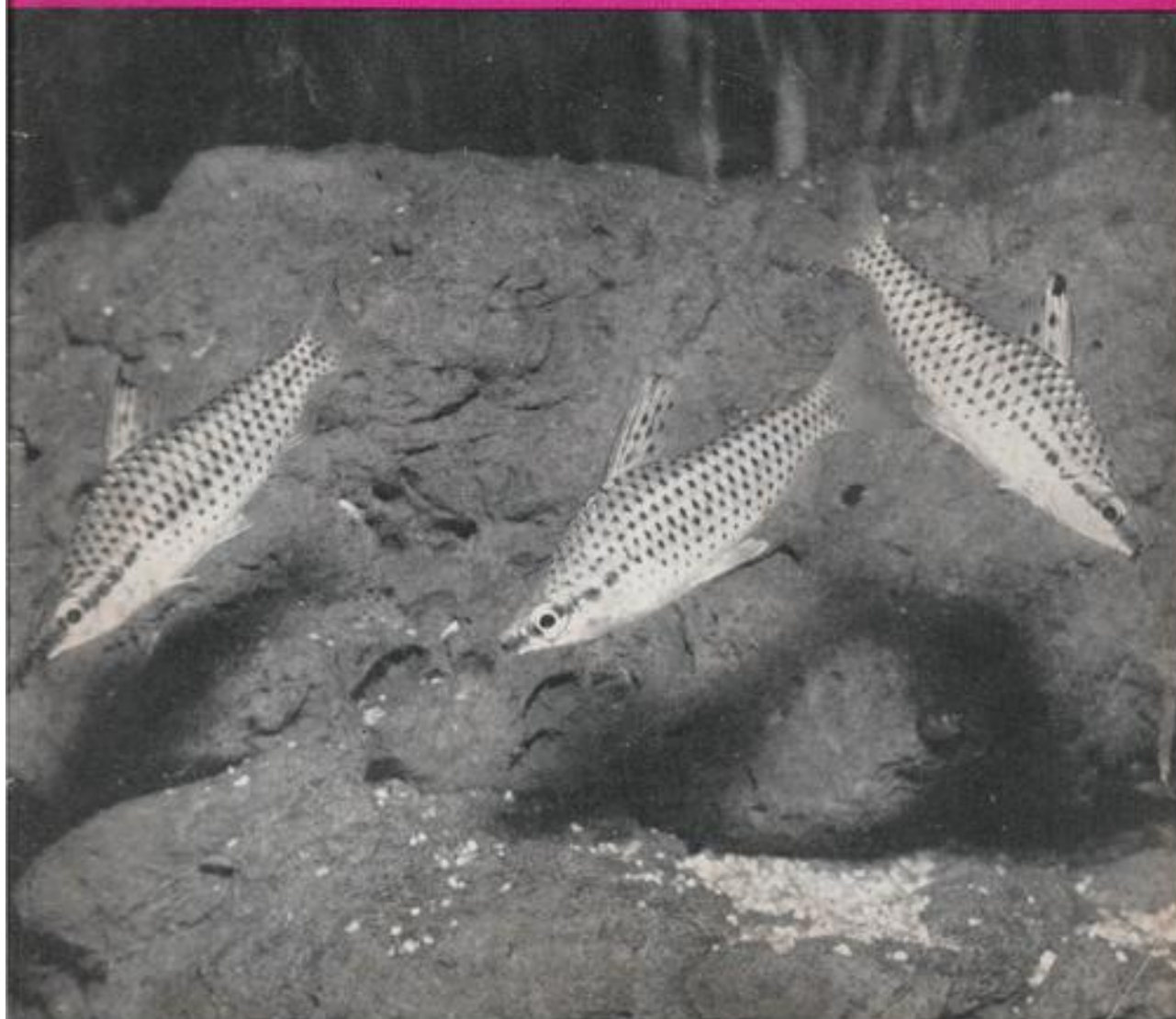


August
1969

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Aquarist
and Pondkeeper



the Aquarist

and Pondkeeper

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"THE AQUARIST AND PONDKEEPER" FISHKEEPING EXHIBITION

held at Alexandra Palace, London, July 10-13.

Full report and photos in our next issue. Results on page 137.

The Editor accepts no responsibility for views expressed by
contributors.

Editor: Laurence E. Perkins

August, 1969

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ANGEL ANTICS

by R. C. Mills

"WAKE UP," said my wife, "it's half past one". The reason for this remark at such an unearthly time, was that we were off on our holiday to Cornwall, and we had decided to travel overnight. The plan was to have a couple of hours sleep, get up and put the kids (still asleep) in the car and set off. So, up we got, loaded up the car and the last thing to do was to switch off the lights over the fish tank. Then it happened!

There in the community tank was a pair of very proud Angel fish with their newly laid clutch of eggs. "That's it", I said, "we just can't go on holiday!" However, when I'd calmed down I realised that the only thing I could do was catch all the other fish, put them into another tank and go on holiday, leaving the Angels to get on with it! This was my first experience of Angels spawning and loath as I was to leave them, I was interested to see what would have transpired by the time I got home again. This turned out to be just what I'd expected—nothing.

This was the start of an ambition to breed Angels and to date has lasted three years. Soon after the early morning episode the pair laid again but promptly ate the eggs; later both fish died and I was without any Angels, sexed or otherwise. I purchased a dozen or so youngsters and impatiently waited for them to grow up.

When they were about nine months old I was pleasantly surprised to see a pair (well two fish anyway) cleaning a leaf and depositing eggs; the two fish were obviously novices at the game, for they had chosen an ordinary *Vallisneria* leaf for their spawning receptacle, instead of a more suitable *Cryptocoryne* nearby, and the eggs promptly fell off and were eaten by the other occupants of the tank. Another spawning a few days later was deposited on the glass side of the tank and again the eggs were eaten by the other fish which literally queued up behind the Angels and followed up the trail of eggs! At this time I was watching closely and it puzzled me why the Angels didn't attempt to guard the eggs, or to keep the others away from the spawning site during the preparatory work; all was revealed at the next "laying" when I saw that both fish were laying eggs, two females having paired off, a not unusual phenomenon apparently in the angel world.

The old aquarist trick of growing up fish from young and letting them choose their own partners paid off later although not as I had hoped. Two more Angels cleaned a leaf and spawned (I had taken the step of providing another tank for them as soon as they had started leaf-cleaning), and the eggs hatched and were generally cared for. Jubilation! One day I noticed that the adults were chewing the youngsters and, forgetting everything I had read about parental care amongst cichlids, assumed that "functime" had arrived and quickly removed the parents. The

youngsters continued to wriggle on the leaf and after a week since hatching took place, one or two swam about but all died within the next few days. I had tried liquid fry food and brine shrimp as original foods but all to no avail.

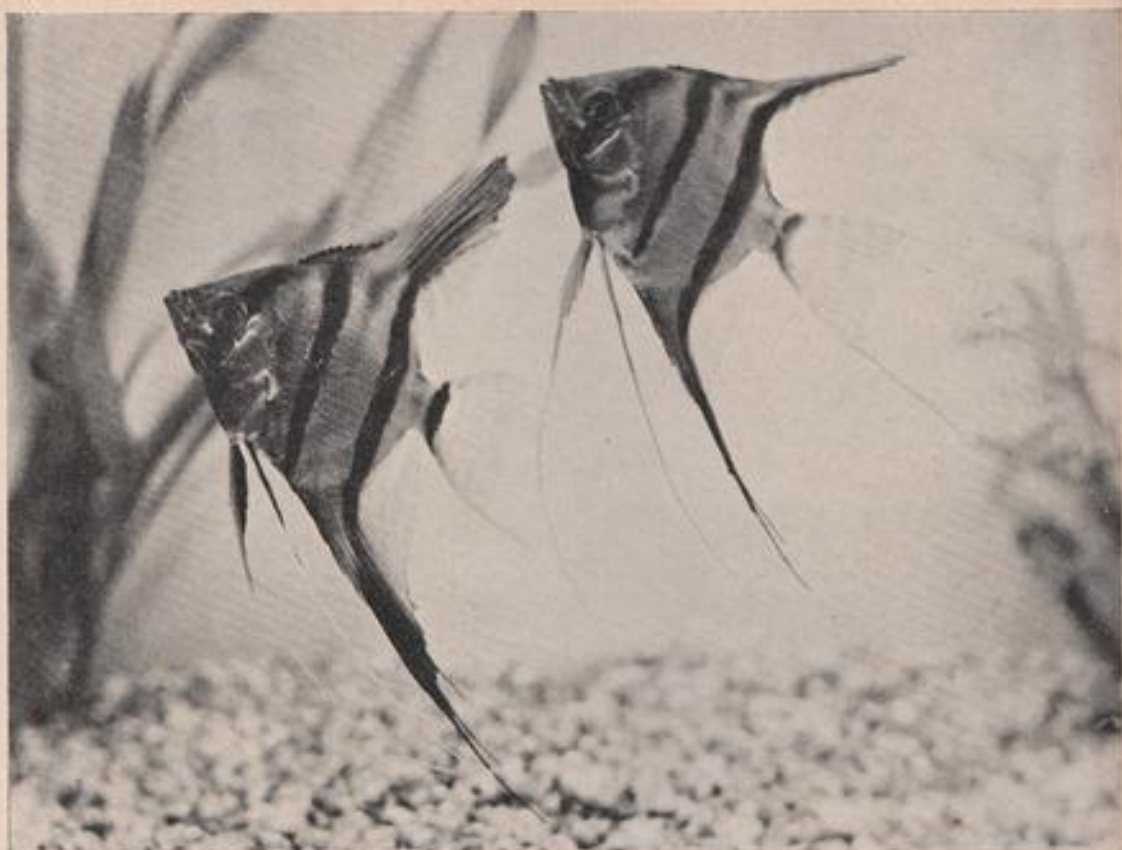
Here the story gets quite complicated and hectic for back in the community tank another pair had set up home so I had to divide that tank to give them some privacy! These two fish also proved to be a genuine pair, the deposited eggs hatching. The eggs were fanned and cleaned constantly, the fry being transferred several times to fresh cleaned leaves and then all trace of the youngsters vanished! By now I was almost beside myself and decided to have a go seriously at raising some fry, keeping an account of everything that I did (and of everything that the eggs and fry did, too for that matter), to try to find a successful formula. At this time I had read up all I could find on breeding Angels and had tabulated all the recommended methods; one particular book I could almost recite by now was the *Aquarist* booklet on Angel fish by F. N. Ghadially (who seemed to have trodden the same path that I was treading now).

The situation now was that I had two willing pairs of Angels; luckily they staggered their spawnings so that I was provided with fresh eggs every week by one pair or the other; little did I know that I was to need all the eggs I could get.

The next two or three spawnings from each pair all proved fertile but the embryos were all eaten around the 4th or 5th day before the fry left the leaf. So then I decided, for safety's sake and for any conclusions to be reached, I must raise the fry away from the parents; in this way I would be in control of all the conditions and also I would not lose any youngsters should the adults get hungry or tired of looking after their fry!

The conditions under which I was attempting to raise the fry was as follows: the water was rainwater (hardness about 5DH), pH 6.8-7.0, temperature 80°F. (indeed this figure appeared to be the green light to my Angels; below it—no spawning). The eggs were removed from the tank in which they were laid (similar water conditions), and placed in a 2 ft. tank with an airstone near enough to cause a circulation of water over the eggs without disturbing them unduly. Methylene blue was added to combat any fungus which might form on any unfertilised eggs (of the amount of blue added, more anon).

In all cases the eggs hatched in two days, stayed on the leaf or slate for another two or three days, then the hatched embryos dropped to the tank floor and gathered in scrums wriggling their tails incessantly, no doubt to aid water circulation and prevent dirt settling. After the eighth day, one or two fry swam, or rather cartwheeled about, and food



was added; this was liquid food and brine shrimp. The result in every case was that the fry died before swimming in a determined manner was reached. By this I mean that a few fry propelled themselves about but not really knowing where or how, or even which way was "up".

My mind seemed quite unable to understand the repeated failures and all sorts of reasons and excuses were thought over and later on even invented! A brief rundown of the more plausible of these excuses—the first one was water depth too great! So the next time the eggs were hatched in shallow water, 4-6 inches in depth. Again the fry reflexed their way about the tank then died. On reading Ghadially's book yet again I decided to use distilled water. Again shallow and again the by now familiar sight of bodies around the tenth day. The next desperate strategic ploy was "blow all the books, I'll stick them in tap water". Again the same result. I really thought that the light had dawned the next time. "The methylene blue is providing too sterile conditions, and no natural infusoria can develop to feed the fry", so the concentration was decreased so that by the time that the fry were due to swim all the blue would have cleared under the action of the light; ah well! Back to the drawing board! In fact, I tried varying strengths of "blue", from inky black (and I couldn't see the eggs!), to very pale blue (and I didn't think it was

strong enough to do any good!). The cause of the next failure was easy to diagnose—heater breakdown!

Not only was I losing patience by now and any hope of ever succeeding, but the two pairs of adults had just about had enough too of providing a constant supply of eggs with no reward for their pains. The next time they spawned the males attacked the females and the eggs were not fertilised and no subsequent spawnings were recorded.

Where had I gone wrong? Water qualities and temperature variations (and I'd tried the lot!), did not seem too important apart from 80° being the temperature to start the adults off. The eggs seemed very hardy and stood up to all my abuse (both physical and linguistic) very well. The only things that could be wrong were feeding, water depth or pollution. Of these I was tempted to blame the first, and yet none of the fry seemed capable of deliberate feeding; in fact, in my desperation I had placed brine shrimp, by means of an eye dropper, right in front of their noses to no avail. Going on the advice of Dr. Ghadially, I had refrained from feeding until the tenth day, but perhaps this lack of food and clean conditions (bacteria-wise due to the methylene blue) was the cause. Certainly water pollution was not to blame, so perhaps I had been starving them? Unfortunately, I couldn't try out these theories as no more

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ANGEL ANTICS

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spawnings were forthcoming and both females died soon after.

Here then, was another *impasse* for the time being; I bought some more youngsters (ironic really after hatching what must have been thousands) and while we are waiting for them to grow up, perhaps a few points on sexing Angels might not come amiss by way of an interlude.

Sexing Angels is often held to be difficult (even to the fish themselves, as my two females proved), and numerous pointers have been given. The majority of these concern the physical appearances of various parts of the fishes' anatomy, i.e. lips, fins, black bars etc., outside the breeding season; from my experience, unsuccessful as it was, only two methods are accurate, and the observations are only possible at breeding time. They are the differences in appearance between the ovipositors, and secondly, the frontal appearance of the fish. Of the first method, the females' breeding tubes are larger in diameter and blunt, with a sawn-off angle to them; the males' tubes are smaller in diameter and conical ended. The reason for these differences is that apart from helping us to recognise the sexes from my observation the female's tube is designed to press the eggs onto the leaf whereas the male's tube is used more as a brush with a trailing motion to spread his milt onto the eggs without dislodging them from the leaf.

The second method is reasonably accurate, even taking into account that Angels do not bulge very much when filled with roe. From the front, the male's body has a narrow cross section, tapering to a point at the pectorals, whilst the female's has its widest point just behind the pectorals; if you can imagine holding the male between thumb and forefinger at the pectorals as though you were about to throw him like a dart, the indentations left by your finger and thumb exactly illustrate the description. Of course the only real proof of your suspicions is to have a "pair" spawn and the eggs prove to be fertile!

Meanwhile, back at the plot. My latest lot of youngsters having grown up, soon set about choosing partners, and here an interesting development took place. A lot has been said about cichlids pairing off for life, as it were; here I had two adults cleaning off a leaf with ovipositors extended, and nearby I noticed another adult, also with ovipositor showing. The pair tended to the leaf for about three days, the usual period I've found, then the male forsook his intended and spawned with the "stranger". The eggs did not hatch; this I put down to bacteria in the tank I moved them to as no methylene blue was added. 14 days later, the male again cleaned a leaf with his original choice, and this time spawned with her and guarded the eggs excellently with her but they fungused and were eaten; 16 days later the male spawned with the "stranger" again and I removed the eggs to another tank to hatch. Here we take up again the long running saga of attempts to end the long succession of failures.

I decided that perhaps as the previous batch of fry may have starved to death I would try and supply food in advance

of the free-swimming stage; so when the fry fell from the leaf into their by now familiar quivering groups on the tank floor, I added an infusoria pill and later some plankton culture. The fry left their groups on the 9th day and swam up to the surface and began their haphazard swimming; unfortunately, I now think, the tank was too small (14x8x8), and quickly became too polluted for after a short time all the fry were dead.

The next spawning was removed to a larger tank with shallow water and left to hatch which it did in the usual two days.

For the next few days the fry wriggled on the leaf, dropped to the floor where many died due to dirt and debris being attracted to the quivering mass (by action of the nearby airstone) and sticking to the fry. However, a couple of dozen survived and swam about and I assumed commenced eating. Then I had to evacuate them quickly because of thermostat failure; a few survived this traumatic experience but all died later.

Meanwhile, the parents had spawned again, and because at that time the previous batch were still going strong, plus the fact that my rearing tank was occupied, I decided to let Mother Nature have a go at raising a few fry!

The eggs were laid on the usually provided piece of slate, hatching two days later.

The parents then moved them to a wisteria leaf, in itself a feat of patience and skill as more fry fell between the leaves than struck to them. This arduous task was repeated two days later. No methylene blue had been added to the tank water and the parents were seen to chew the fry in their mouths for minutes at a time; just as I had decided that the fry had been eaten, they would be spat back into the nursery clamp on a new clean leaf. Normal feeding was continued during the hatching and cleaning period, more to make sure that the adults didn't get hungry than anything else! The only precaution taken was to take a piece of cloth and drape it over the front glass so that the parents would not be too disturbed by my inquisitive peerings into the tank.

One thing that I noticed in the way of differences between the two hatchings was that the second batch seemed more alert, brighter of eye and bigger than the batch that was hatched away from the parents; the most noticeable thing being the colour of the fry's eyes. Those under parental care had clear golden eyes, whilst the fry raised away from such care had dull and, dare I say it, lifeless looking eyes. Another thing that contributed to the well-being of the fry (in my opinion the most important factor of all) was the cleaning processes carried out by the parents; when eggs are hatched separately, once they hatch they must be kept clean and clear of dirt and debris; this goes for any fungus that may form on any unfertilised eggs also. Methylene blue does much to alleviate the latter but I believe that unless the eggs are well aerated, the sticky threads holding the fry on to the leaf will trap dirt and smother them, even preventing their tiny mouths from functioning so that some will suffocate. It may not be a bad idea to emulate parental



action and move the clusters of fry about every day and keep them separate. Aeration at this time can be quite brisk and when the fry do eventually swim it won't hurt them to swim against the tide!

As soon as the fry become free swimming the question of what food to give them has to be answered. Angel fry are, in common with other cichlid fry, quite large; large enough to take newly hatched brine shrimp and fry sized dried food. When to feed? Well, certainly not before the fry reach the free-swimming stage as the yolk sac will suffice up to this point. Some people may advocate adding something to the tank before this stage to help provide infusoria; however, from my experience, I would rather avoid doing this as anything added to the tank unnecessarily may lead to pollution or even worse, stick to the wriggling mass of fry; any infusoria produced may be too small to be of value anyway.

The free swimming stage is reached after 8-9 days and at first the fry hop up and down on the leaf, trying to find out which way is "up". This is not intelligence but just that the swim bladder has to start functioning; another hint given by some breeders is that the water depth be kept shallow to assist the fry to reach the surface and fill their swim-bladders. This may be a debatable point as if you leave the fry with their parents you've got to leave the parents enough water to swim in! There may be a grain of truth in it for my parent fish kept the eggs and fry near the surface whilst the hatching was taking place, so perhaps water pressure is instinctively taken care of too.

The newly hatched fry were, at this time, getting ready to swim; one or two made a desperate leap from the nursery

leaf, only to be forcibly returned by one of the parents. However, the fry were quite determined, so the adults moved them again, no doubt hoping that the fry would prefer their new home. On the 8th day when I looked in the tank, all the fry were sitting on their leaf as usual. I switched on the light and an amazing thing happened! All the youngsters rose from their slumbers and swam around in a large cloud; the parents were quite astonished, being faced with one or two truants from the nursery was one thing, but mass mutiny was a different tank of fish; they just didn't know which way to turn. In the end, the fry were allowed a certain area in which to swim, and woe betide any that strayed too far. One parent or another would chase after it and, catching it in its mouth, swim back to the rest of the tribe and blow the culprit back into the herd. Another interesting point was that the parents wouldn't allow too many youngsters to congregate on the tank bottom; as soon as more than half a dozen got together, down would come mum or dad, suck up the tiny gang and return them to the rest of the swimmers. Of all the fry, only one did not reach the free swimming stage, and was left hanging from the leaf; there seemed to be a swelling on the stomach and I assumed it was a congested yolk sac.

The first food that I gave this batch was powdered dried food; this was accepted quite readily (thank goodness!), and brine shrimps were set to hatch. There seemed to be quite a lot of food for the fry from the natural condition of the tank; the tank was quite clean, but had become "conditioned" by the plants and the excreta of the parents. As I've said, the fry took the dried food very well, although the parents were a bit nervous at all the dashing about! Newly

ANGEL ANTICS

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hatched brine shrimp were taken just as readily and it was quite reassuring to see those tiny stomachs turn a pink colour! I noticed that during feeding the fry would accept anything as long as it was falling through the water but once it reached the bottom they lost interest, or maybe they lost sight of it. However, all was not lost, for down would come one of the adults and with a swish of a fin, the food would be stirred up and the fry would recommence their meal. Similarly, if a few strayed from the feeding area, and some of them were getting quite adventurous by now, the parents would collect them and bring them back as if they wanted all the fry to have a fair share. The parents themselves didn't seem to take much food at this stage although if a flake of food came too near the fry it was soon disposed of!

This gave me a few anxious moments of thought. At what stage would the adults decide that the fry looked good enough to eat? Would they try and raise another brood or would they lose interest in having a family around them? I decided to risk it for a further few weeks; in fact I was forced to leave them over the Easter period. No harm had come to the fry on my return, nor to the few I had removed to another tank as an insurance against parental hunger.

By this time the fry were 10 days old and had acquired a bit of colour; most noticeable was a dark patch on the top of the head and there were longitudinal stripes on the body. The dorsal was very minute and set a long way back from the dark patch which seemed to develop into a hump. The overall impression was of tiny little helicopters swimming about.

Comparing the behaviour of the two groups of fry, those I had taken away kept close together as though they missed the security offered by the parents and did not venture from one part of their tank; the others, on the other hand, were much more self-assured (perhaps they sensed the protection of the adults) and swam at all depths.

When the fry were 16 days old the parents spawned again much to my surprise and dismay. However, they divided their attention between the fry and the eggs; a curious thing took place whilst they were fanning the eggs. Any inquisitive youngsters that came by to have a look were picked up and spat amongst the eggs as though they were newly hatched! At this treatment the fry decided to join the other adult at the other end of the tank! As the eggs were not receiving the undivided attention of both parents, I was interested to see whether they would turn out to be fertile or not; in fact it is hard to come to a conclusion on this issue. The eggs remained clear and were probably fertile; however the fate of them can be attributed to a few causes. I did notice snails moving amongst the eggs so they could have gone that way; again, the parents being surrounded by young fry, may have decided that the eggs had hatched and that any eggs left on the leaf would not produce any more fry and ate the rest. Whatever the reason, all the eggs had disappeared after 4 days.

I have said that I was astonished, along with the parents, when the fry unanimously decided to swim; I was even more amazed later that day, when I looked in the tank towards the end of the evening. I couldn't see any fry

and immediately thought that the worst had happened. However, there were all the fry, sitting on a leaf in a group having been put to bed by the parents; they seemed quite content with this arrangement with no signs of mass mutiny and settled down for the night. A routine seemed to have been agreed on between parents and offsprings for next morning the happy family was up and about again, looking for food.

At three weeks the fry had begun to change their physical appearance. Up to now they could have been almost any young fry, but after the second week the dorsal and anal fins began to grow longer, the dorsal in particular being quite recognisable as an Angel fish shape, with the first few hard rays discernible. The body was still long in proportion to its depth but one or two of the fry, being bigger all round, had the beginnings of the deeper body shape and were, at $\frac{1}{2}$ in., nearly perfect miniatures of their parents. Brine shrimp was still given but the fry could manage crumbled flake food and having been seen chasing tubifex given to the adults, this commodity, chopped up, was added to the diet.

For me, an ambition had been achieved. Sometimes I feel a sense of anticlimax, but the sight of the Angels with their young is one I shall never forget (even if it was risky leaving the fry to the care of the adults). Next time I shall try and raise some fry away from the parents, as this was what I was trying to do at the outset, this probably being the only way to raise large numbers successfully and quickly.

From all this, the most important factor contributable to success seems to be cleanliness; the fry must be kept free from dirt to ensure survival and obviously the best way of attending to this is to trust the parents (not an easy nor recommendable thing to do!). One last suggestion on this subject (prompted by the sight of Texas cichlids which dug up the gravel, spawned on the undergravel filter plate and let water circulation do the rest!), one could utilise a bare tank, save for gravel and undergravel filter, to try and keep the wriggling fry clean; that's about the only variation I haven't tried!

There is a sequel to all this, and shows what extremes one can go to; I visited my brother-in-law and he had Angels spawning regularly but either eating the eggs or generally ignoring them as soon as the tank lights were switched off. He was going on holiday and couldn't spare the time to hatch the eggs separately so I said that if the fish laid while I was there I'd take the eggs and try and raise them for him (decent of me, I thought!); luckily for me they obliged, so I removed the egg laden leaf and took it home.

At this time I'd just removed my young fry from the parents as the adults looked like spawning again and, indeed, laid eggs that same day; I thought that I would let them be foster parents to the other eggs as they had been such good parents before. I put the leaf near to their own eggs and after they had got used to the intruder, included the new batch of eggs in with their own when the time came for the first move to another leaf. Both batches hatched (at least my brother-in-law has got a pair!), although my adults were a bit perturbed why one lot of fry hatched a day earlier than the other, and what they are going to think when some of their young grow up and don't look like Mum and Dad is anybody's guess! It would be interesting (?) to try and get adults to raise other cichlid eggs, but I expect the different hatching and development rates would cause a bit of confusion, to say the least—and one other tricky problem to overcome—both pairs must spawn on the same day!

RESULTS of the "Aquarist and Pondkeeper" FISHKEEPING EXHIBITION

held at Alexandra Palace, London.
July 10th to 13th, 1969.

Class AA. Club Furnished Aquaria Tropical

	Pts.
1st Bracknell Aquatic Society	84
2nd Tottenham Aquatic Society	81
3rd Walthamstow Aquatic Society	80
4th Fancy Guppy Association	78

Class AB. Club Furnished Aquaria Coldwater

	Pts.
1st Tottenham Aquatic Society	82
2nd Walthamstow Aquatic Society	81
3rd Portsmouth Aquatic Society	77
4th Hampstead Aquatic Society	68

Class AD. Individual Furnished Aquaria Tropical

	Pts.
1st S. Mooney, Muswell Hill	79
2nd S. Smith, Haywards Heath	75
3rd B. Thornton, Tottenham	74
4th F. H. Watts	73

Class AE. Individual Furnished Aquaria Coldwater

	Pts.
1st F. Stone, Hampstead	68
2nd F. Stone, Hampstead	65
3rd F. Stone, Hampstead	63
4th D. Sanford	60

Class AF. Marine Furnished Aquaria

	Pts.
1st L. Clements, Tottenham	71
2nd G. Jennings, Holloway	68
3rd K. Jennings, Holloway	63

Class AG. Junior Furnished Aquaria

	Pts.
1st P. Ellis	73
2nd S. Millcross	68
3rd K. Smith	64
4th J. Ellis	63

Class AO. School Furnished Aquaria

	Pts.
1st East Barnet Grammar School	70
2nd Warwick School for Boys	67
3rd Southaw Girls School	63

Class AP. Society Junior Furnished Aquaria

	Pts.
1st Tottenham Aquatic Society	74
2nd Tottenham Aquatic Society	71
3rd Ealing and District Aquatic Society	70

Class ZA. Rooted Plants

	Pts.
1st T. R. Duffy, Bracknell, Berks.	90
2nd Mrs. J. E. Stott, Walthamstow	85
3rd Mrs. J. E. Stott, Walthamstow	84
4th T. R. Duffy, Bracknell, Berks.	83

Class ZB. Plant Cuttings

	Pts.
1st T. R. Duffy, Bracknell, Berks.	85
2nd S. G. Mooney, Muswell Hill	84
3rd G. Greenhalf, Morden	81
4th G. Greenhalf, Morden	80

Class NQ. Swordtail Pairs

	Pts.
1st J. Hatton, Grays Essex	75
2nd S. Mooney, Tottenham	69½
3rd J. Whittaker, Enfield, Middx.	69
4th S. C. H. Smith, Haywards Heath, Sussex	68

Class NR. Platy Pairs

	Pts.
1st L. G. Little, Bracknell, Berks.	73½
2nd S. G. Mooney, Muswell Hill	73
3rd J. Hatton, Grays, Essex	71½
4th L. G. Little, Bracknell, Berks.	71

Class NS. Molly Pairs

	Pts.
1st M. Smith, Walthamstow	76
2nd M. Smith, Walthamstow	72½
3rd S. Mooney, Muswell Hill	72
4th L. G. Little, Bracknell, Berks.	71½

A full report and pictures will appear in our next issue.

OUR EXPERTS' ANSWERS TO YOUR QUERIES

COLDWATER QUERIES

by A. Boarder



How long should a 30 watt light tube be left on to help my plants grow in a 18 x 10 x 10 in. tank which is in a light position?

As your tank stands in a light position it may not be necessary to keep the light on for many hours. Take notice of the weather and on a bright day do not switch on, but on dull days the light can be on for five or six hours. Also as the days get shorter keep the light on longer.

Can you please tell me how to set up a tank for breeding goldfish. This tank is 12 x 8 x 8 in.? Also any tips on breeding will be appreciated.

The tank is very small for the purpose of breeding goldfish. I doubt very much if you are likely to have any success with such a tank. Your fish will need to be at least three inches long and these would normally require about 144 square inches of surface area and your tank has only 96 square inches. When goldfish spawn they chase about and require plenty of swimming space and so it is not likely that your fish will breed in such a small tank. You would probably do better with one of the small plastic baths as sold by a chain store. As there are many tips which could be given about breeding goldfish you will be well advised to get the book "Coldwater Fishkeeping", from "The Aquarist" magazine, as this book gives all the necessary information you would need.

I have followed with success the articles on breeding goldfish in "The Aquarist", and would now like to get some fresh fantails to improve my strain. Can you tell me where I can get good quality fantails for breeding purposes?

If you watch the advertisements in this magazine you will find a supplier of these fish although I know that good quality fantails are in short supply. However if you do buy any fantails try to find out under what conditions they had been reared. Many fancy goldfish are imported from warm climates and they are then rather difficult to get used to a very changed conditions. A gradual cooling down will be necessary but if this is done with care the fish should become hardened to an outdoor pond if required for this.

For the past three years I have lost all my goldfish from an outdoor pond. It appears they die of a wooly substance which I believe is called Fungus. This usually happens in the spring and the fish have been quite well all the winter. I have tried recommended treatments but all to no avail. Can you help please?

I think that I can state without fear of contradiction that more fishes are lost during the spring of each year through

Fungus disease than from any other cause. Time and again I hear the same story and year ago I used to experience the Fungus trouble with a fish or two during late April or early May. It may be helpful if I describe the disease and its cause, as I am certain that many other pondkeepers will find this useful. The disease is caused by tiny moulds and spores of the *Saprolegnia*, which Genera contains many members, and these are present in most waters and can perhaps be compared with the germs of the common cold. The spores attack any fish which is in bad condition or has been wounded. Healthy fishes are covered with a mucus which acts as a protection against the disease. Once any part of this mucus is removed or weakened the Spores can gain access and a type of thread known as hyphae grows into the skin of the fish. This can penetrate deeper into the fish and spread over the body, thus weakening the fish until it eventually dies. Usually death will occur when the Fungus reaches the gills or gets such a hold on the fish as to eat deeply into the fish. Sometimes fishes are injured during the spawning chase which can be very vigorous and much of the mucus may be removed. The general condition of the fish will be governed by the state of the water during the winter. If the water is foul through too much decaying matter in the pond during the winter the fish, which are normally sluggish during the cold weather become out of condition. However it is possible that when the water is very cold the spores of the *Saprolegnia* are also inactive, but become livelier once the water warms a little in the spring. Many types of treatment have been recommended and the usual salt treatment will cure a fish unless it has become too weakened by the disease.

Having described how the disease starts it should be possible to combat its recurrence by making sure that the pond water is in healthy condition. Remember that healthy fishes will not be affected and so any small pond should be cleaned out early every winter when any foreign matter can be removed and the water given a chance to remain pure all the winter. Food must be given sparingly during the winter as the fish will not be eating much, if at all, when the water is very cold. Uneaten food will pollute the water as will a lot of decaying vegetation, and the latter includes water lily leaves and dead flowers.

I am setting up a 36 x 15 x 12 in. coldwater tank and would like to know which kinds of fishes live together in harmony. I made a mistake as I added two catfish to a tank of small goldfish and they terrorised them?

There are two main types of fishes, those which are carnivorous and live on other fishes and the type such as goldfish which are mostly vegetable eaters. Among the dangerous ones for coldwater tanks are:—Perch, Pike, Catfish, Eels and some of the sun bass. Types which are

usually available for coldwater tanks are:—All varieties of goldfish, Tench, Rudd, Roach, Minnows, Gudgeon, Bleak, Bream and Bitterling. I recommend that as well as varieties of goldfish, the Tench and Rudd are likely to be the better kinds to have.

One of my goldfish developed fin-rot and I had to cut away part of the pelvic fins. Although I have had the fish in a commercially recommended salt solution for two and a half months, the fins have not regrown. Can you give any advice please?

Damaged fins usually grow more quickly than you state and I suspect that the general health of your fish has been weakened by it being immersed in the salt solution for such a long time. The disease should have been cured in about a week and then the solution should have been gradually weakened to fresh water. Do this and the fish should soon grow fresh finnage.

I have a concrete pond in the garden with a surround which holds bog plants. This surround has suddenly started leaking. Is there anything I can do to seal it?

You can dry it thoroughly and paint it with a good bitumastic paint, or float it over with a mixture of one part cement to three parts small, sharp sand. To make sure that no further leak occurred you could line the surround with Butyl lining and then float the mixture over this.

One of the goldfish in my tank does not appear to be very healthy as it lies on the bottom for some time. What do you think is wrong?

It is possible that the water conditions are wrong. It may be that a quantity of water needs changing. When fish have been in the same water for some time it becomes impure because of the waste matter from the fish and that the water plants may not be either growing well or there may not be enough of them. Change a large amount of the water and you may find that the condition of the fish will improve. It is a wise policy to change part of the water every week when the servicing is carried out.

I lost some of my goldfish in the pond during the winter. When dead they showed no signs whatever of damage, and I could not see any cause of death. I had only bought the fish in the autumn and would be grateful for your comments?

When fish die and show no visible signs of injury or disease it is usually that the water conditions are wrong or that the fish had received a chill during the winter. The fish may have been bred under warm conditions and when you bought them they had not got accustomed to colder conditions. Goldfish do not just die for no reason and so the state of the water should be examined, and your treatment looked into. You say you fed with dried food during the winter. This is not a good practice and most pond water will keep healthier for fishes when no food is given when the weather is cold.

For the last two years I have bred a number of goldfish in my pond. Many of the youngsters have gradually turned white and some have black eyes. Why is this please and can it be the condition of the water?

It is not the condition of the water which has caused your young fish to turn white. This is because the fish have come from a strain of goldfish which were either shubunkins or which contained some Shubunkin blood. If a common goldfish was paired with a Shubunkin, the resultant youngsters would be of several colours, some taking after one parent and some after the other. When any of these were bred from, they would produce many varied colours, some gold, some silver and some half and half. If you continue to breed with these cross-breeds you will never get any decent types of goldfish from the progeny.

I would like to know why a fish taken to two open shows only a fortnight apart should come nowhere at the first show but first at the second. The fish was in perfect condition at both shows and the judges were the same?

It is always difficult to give a reason why the same judges should mark a fish differently at two shows. It could be of course that at one show, the fish was temporarily out of condition when judged. Some fish sulk now and again and a fish which was passed over by a judge one hour could look totally different the next. I have known a class to be extended round the stand and so a fish or two may be missed by the judges, especially if it was the only one round the corner and was next to another class altogether. It may be of course that the other fish were of different quality in the two shows. It is a pity that you could not have been present after judging to ask why the difference.

TROPICAL QUERIES

I bought some black widow fish (*Gymnocorymbus ternetzi*) the other day. To what length does this fish grow and is it easy to keep and breed?

The black widow fish attains about 2 in. in captivity and a little over this in the natural state. It is a fish that does well in the tropical aquarium and sometimes stays alive and in excellent health for several years. It scatters its eggs in the plant life and is a ready-breeder at a temperature in the upper seventies or low eighties (°F.)

I do not wish to install an underground filter but would welcome any suggestions as to how I could keep the grit along the front of my aquarium free

from excessive waste products which, I have been told, leads to a build-up of noxious gases and harmful organisms.

Obtain a length of rigid plastic tube and seal one end with a non-toxic plug. Prick holes with a sharp bodkin every $\frac{1}{2}$ in. or so along its entire length and connect the free end to a few feet of flexible tubing. Now, bury the perforated tube in the grit where the debris tends to lie thickest and, every so often, send a strong flow of air down the tubing. This will force a lot of the dirt out of the grit and, at the same time, freshen it up. Follow this with a good siphon-

Continued on page 140

TROPICAL QUERIES

continued from page 139

ing to remove the sour water and putrefying matter from the bottom.

I have a Jumbo size glass jar with a small neck to take a screw-on lid. Would it be possible to take the top off this jar so that I could use it as a miniature aquarium?

Tie a strand of thick knitting wool round the jar where you wish to break it. Now saturate every part of the wool with methylated spirit. Apply a lighted match and watch the wool burn away in a circle of dancing flames. The instant the flames die down hold the jar—the hot part—under a dripping coldwater tap. The top of the jar should break off with a loud crack. If it does not, give it a sharp tap with the handle of a screwdriver. Then blunt the razor-sharp edges of the glass with a corborundum stone. We do not guarantee that this top-removing operation will always meet with success, but in most cases it does.

What size tank and kind of furnishing will I need to spawn *Tilapia mossambica*?

As large as possible say, 48 in. by 15 in. by 15 in. for the tank. Then cover the bottom with about 3 in. of washed sand and place some well-scrubbed not-calcareous rocks at each end for the couple to use as a courting and/or spawning area.

I am thinking of buying a number of neon tetras to add interest to my 18 in. by 12 in. by 12 in. community tank. At the time of writing, it is stocked with two small angel fish, a pair of dwarf gouramis, and a pair of guppies. How many neons will I be able to keep with these fish?

If the angel fish are really small, then you can add up to four neon tetras without any fear of upsetting the comfort and well-being of the other fishes in your tank. Without the angel fish, however, you could introduce up to about seven neons to make a very decorative aquarium.

How can I find out the hardness and pH value of my tapwater?

Inquire at the information desk of your local water authority. There are also kits on the market (they are listed in at least one of the major dealers' advertisements in every issue of this magazine) which enable the serious aquarist to test his aquarium water (or water straight from the tap) for its degree of hardness or pH value.

Would a plastic dustbin be suitable for collecting rainwater for a softwater aquarium? And how could I prevent dust and wind-blown debris falling into it?

A plastic dustbin or similar container makes a first-class rainwater butt. But give it a good wash-out before setting it up, and do not allow water to drain into it from an iron or newly painted or concrete roof. If the lid of the dustbin is domed reverse it so that the surface presented to the rain dips in the centre. At this point punch a few holes.

Cover them with a pad of nylon kept in position with a heap of washed stones.

Please supply me with the scientific name of the silver shark. Also, I should like to know whether this beautiful fish makes a suitable addition to a community tank?

The silver shark is *Balantiocheilus melanopterus*. It grows to about a foot in its native waters in south-east Asia, but usually stops short of six inches or so in captivity. It does no harm to other fishes or near enough its own size.

I have a green knife fish. I should appreciate some information on its care, disposition, and maximum size.

The green knife fish, or *Eigeonannia virescens*, likes peace and quiet in a softly lighted aquarium maintained at about 75°F (24°C). Given a diet rich in worms, *Daphnia*, meat and the sensibly-blended dried foods, it will soon put on inches but we doubt whether it will ever reach the 18 in. or so it reaches in the wild. Small specimens are harmless in a community tank (though it is best given a tank to itself) but medium to larger size specimens will attack and eat fishes much smaller than themselves.

In an American magazine I read that the house-plant called sansevieria is quite suited to growing in the tropical aquarium. Is this true?

What rubbish is printed in some aquarium magazines. *Sansevieria* in its several species and varieties dislikes wet intensely, except during the heat of the summer or if kept in an overwarmed room. And even then water should not be allowed to stay long round the roots. A sharp drainage is essential. *Sansevieria* is a desert plant—not a bog or water plant.

I am a beginner and would like to know the best temperature for tropicals?

The best temperature for most popular species is 75°F (24°C) or thereabouts. There are, however, quite a number of species that find 75°F (24°C) a trifle high for comfort, except when breeding time comes round, and among these we would include the White Cloud Mountain minnow, the black-banded sunfish, the Japanese medaka, and the bloodfin from the Argentine.

In a moorland stream I found some snails with almost spherical shells banded reddish brown on a greenish ground. The opening of the shell was covered with a horny operculum. Would these snails live in a tropical aquarium and what are they called?

The snail you found is called *Viviparus viviparus*, the so-called freshwater winkle. This pretty snail may be acclimatised to living in warm water and does little harm to water plants. It produces living young.

OUR READERS WRITE



Discus Down Under

I was pleased to read Brenton C. Nicholson's comments on the article I wrote (Experiments in Keeping Discus). Although I appreciate the points of Mr. Nicholson's comments I am unfortunately unable to agree with all of them.

Personally, I feel that it is easier to furnish aquaria with neutral gravel for a number of reasons, and not just for Discus I might add.

I cannot agree that alkaline gravel affects the water only very slowly. Surely this depends on how alkaline it is in the first place? However, the initial effect is not the main concern but the build-up that occurs within the tank after some time. The water that one uses for partial changes then has to be progressively softer and more acid to maintain original conditions.

I have also found that plants do much better in a neutral substrate. As to the suggestion that I was perhaps too fussy, he may well be right. In retrospect one may be able to keep Discus successfully in a bucket if prepared to take the risk. I did try to make it clear that in the main the Discus concerned were not mine and for this reason I tried to cover every possible aspect if only for economic reasons. The methods I suggested evolved from information from Germany which is the most advanced nation in the Aquatic World? . . . nuff said!

At this juncture I would also like to make it clear that all the Discus concerned, before they were returned to stock, were accustomed to tap water and in the great majority of cases, to accepting foods other than *Daphnia* and *Tubifex*.

When Discus are purchased the buyer is likely to be spending a considerable amount of money. The beauty and noble, almost regal nature of Discus, I think, warrants a position where they will be seen and can be enjoyed, i.e. in one's living rooms. I think decorating their tank with clay tiles, flower pots and suchlike is rather like wearing a cloth cap with a dinner jacket. My method of approaching the subject was to (where possible) give the fish 'natural' surroundings. With tank bred specimens this may not apply.

I was particularly interested in the statement concerning glass wool. Had Mr. Nicholson examined the number of fish that I have and seen the damage to the gills of these fish by splinters of this material I doubt if he would recommend it quite so readily; the difference in price between glass wool and nylon is only slight and for a few pence saving certainly not worth the risk.

Discus will live quite happily in most water conditions and are a good deal harder than we credit them with being, but I have found that the fish eat better, show far better colour,

are more active and appear more at ease when the water conditions are as I mentioned; further to this, soft acid water does discourage the growth of algae and inhibit the development and establishment of bacteria. Clean tank water was suggested as being suitable. If this means water from another aquarium; unless one has means of determining that the water is, in fact, clean I think this a dangerous practice. It has been established by world authorities on fish diseases that water, if only splashed into another tank, can be sufficient to establish a disease vector, and with the greatest of respect, Brenton, I think I'll take their word for it. These same authorities make definite statements relating to rainwater that has washed off roofs. As to what can be harmful on a roof:—immediately obvious, soot, notorious for its ammonia content and harmful if not lethal, to all species of tropical fish. It has also been established that Discus are sensitive to almost undetectable traces of iron. Here, in England, most of the drainpipes are made of cast iron (although many are being changed to plastic.) Need I say more?

As to the feeding of Discus and not warming the food to tank temperature, may I suggest that an article by Heinz Lindner published in T.F.H. Feb. 1967 is read? My experience has been that many Discus who refuse all foods offered will take *Tubifex* and *Daphnia*. In some cases the fish are not fed before they are exported to prevent the bag in which they are shipped fouling. My main concern was to get them eating then persevere with other foods.

I did not deal with the problem of algae in Discus tanks simply because I did not and do not have this problem and, as mentioned, if sufficient attention is taken with the water and lighting this, in the main, I have found deals with algae. Personally, I think that algae is beneficial; fish certainly like a certain amount present. To use snails as eradicators of algae I consider not desirable as many diseases can only manifest themselves if snails are present in aquaria; also any service they give cleaning a tank I feel is vastly outweighed by them adding their droppings to those of the fish, breeding at an alarming rate and being extremely difficult to eradicate once they establish themselves.

The use of *Labeo* to carry out this function, again, I think unwise; both species I have found not to be the best community fish and are boisterous. I have sharks that 'sought out' fish many times larger, and both species I have found unpredictable and able to hold their own even against large cichlids. In fact, the only way I have found to keep sharks from molesting or harrying other fish is to keep them in a shoal.

As to an Association, many who have offered support feel that our interests in Discus would be best served with the

forming of a CICHLID ASSOCIATION, and the first steps have been taken. Support has come from many quarters and the offer of assistance has been given by a great authority on Discus, I would be delighted to write to Mr. Nicholson if I could be furnished with his address perhaps he could start an Australian branch!

ROGER M. WINTER,
24, New Town Road, Northampton, NN1 5LB.

Koi Carp

May I offer congratulations to K. Fawcett, on his comments on the Koi. What a pity they grow so big. People like myself who keep the standard 24 in. x 12 in. x 12 in. tanks are going to be very disappointed at the size they grow. Perhaps you could get Mr. Fawcett to give us some further information.

- (1) Will the usual tap water be suitable to Koi?
- (2) Are they subject to fungus and fin rot like the goldfish?
- (3) What is about the average temperature he thinks would be best suited to them?
- (4) Do they like well aerated water or static water?

MATTHEW CASS,
14, Dorset Gardens, Brighton.

FIND THE FISH

by Doreen Thiel

The first is in GRACE but not in POISE,
The second is in SILENCE and also in NOISE,
The third is in MAY but not found in JUNE,
The fourth is in SONG and also in TUNE,
The fifth is in WHIST but not in BRIDGE,
The sixth is in LEDGE and also in RIDGE,
The seventh is in TELEGRAM and also in CABLE,
The eighth is in MINK but not in SABLE,
The ninth is in CIGAR and also in PIPE,
The last is in ONION but not in TRIPE.

Solution on page 155

Tubifex and infection

A remark by Mr. Nicholson in his letter in your May issue raises a point which has bothered me for some time especially since I now have a one-year-old baby. The question is this. Never mind the hazards to the fish, what sort of hazards are there to human health in keeping tropical fish?

It would appear, to put it bluntly, that tubifex live in areas near the outlets from sewage works. It is also a well-known fact that typhoid and poliomyelitis are spread via human faeces. (There was recently a scare about the discharge of effluent from railway trains onto the tracks being responsible for the spread of disease.) Also bilharzia is spread by snails. Liver flukes can be caught by eating

wild cress. One could, of course, continue like this and end up by not moving out of bed!

Seriously, however, I would welcome some authoritative advice on the hazards of tubifex, with some remarks about the effectiveness of soap and water in removing germs (not fish!) and also some ways of sterilising tubifex (apart from boiling them).

I know you will get some letters from the old hands stating that "they have been keeping fish 20 years and they have never caught a thing" but how about reassuring us nervous types?

W. N. CLIFF,
Aert Van Neslaan, 301,
Oegstgeest,
Netherlands.

DH and pH

I have only been keeping tropical fish for one year. In that time I have kept them in a decorative fish tank. I have got another tank, and I thought I would have a go at breeding some fish, but I came to the problem of pH and DH. I have looked at many books to solve it, but when it starts to explain it, it is in such a muddle it makes it more complicated.

I think that more people would keep tropicals if instructions were given in easy form.

I would like to hear from anybody who finds this problem.

NIGEL WHURR,
18 Undercliff Road West,
Felixstowe,
Suffolk.

TRADE REPORT

Marine aquarists may be interested to learn of a new range of products for use with marine aquaria. There are ten products in the new MARINA range. Marketed by Messrs North Agencies (P.S. Services), which is run by Mr. G. H. Jennings, a director of the International Marine Study

Society, all ten products carry that Society's "Seal of approval."

The first nine products, aptly labelled MARINA'S 1 to 9 retail at 5/6 and 8/- according to size and are comprised as follows: An Oodinium remedy (harmless to invertebrates) Whitespot remedy, Fungus remedy, pH Buffer, Algal Fertilising Solution, Trace element Solution, and three types of Bactericidal Solutions.

Readers of *The Aquarist* may be interested in the offer of a free trial of any one of the above products, which

is extended to them by North Agencies. If any reader wishes to take advantage of this offer, please send a 1/- p.o. to P.S. Services (for the address, see classified ads section). A sample will then be forwarded to them. Trade enquiries are also invited.

The last, and most specialised product in the range of MARINA products is a test kit (which enables the mariner to check his tank water for concentrations of algal growth chemicals—a 'must' with natural and semi natural tanks.

2nd NATIONAL FURNISHED AQUARIUM EXHIBITION

St. George's Hall, Bradford

RESULTS

Best Aquarium Exhibit in Show:	
J. E. Taylor, Blackpool	82½ points
Second Best Aquarium Exhibit in Show:	
D. Shields, Halifax	81½ points
Third best Aquarium Exhibit in Show:	
D. Shields, Halifax	80 points
Fourth best Aquarium Exhibit in Show:	
T. A. Hardman, Bury	79½ points
Fifth best Aquarium Exhibit in Show:	
J. E. Taylor, Blackpool	79 points
Sixth best Aquarium Exhibit in Show:	
R. Johnson, Bradford	76½ points
Seventh best Aquarium Exhibit in Show:	
H. Greenwood, Wilsden	76 points
Eighth best Aquarium Exhibit in Show:	
P. Hughes, Mold	73½ points
Ninth best Aquarium Exhibit in Show:	
East London Aquarist Society	73 points
Best Marine Aquarium Exhibit in Show:	
D. W. Sanderson, Southport	76 points



Mr. J. E. Taylor, Blackpool receiving a cheque for £100 at the K.B. 2nd National Furnished Aquarium Exhibition, Bradford. Photo by Barry Pengilly

JUNIOR AQUARIST

Our usual feature for Junior Aquarists
will appear in the next issue.

REVIEW OF MILAN TERRAQUARIUM

by B. Whiteside

A RECENT VISIT to the continent, with twenty-two school children, did not leave much time to search for local aquaria, but, by chance I came across Milan's Terraquarium which is situated in the underground, almost underneath Milan's magnificent Gothic Cathedral. There was little indication at the entrance as to what was on view inside, but I paid my 250 Lire (approx. 2s. 6d.) and proceeded into the darkened interior.

The Terraquarium contained a wide selection of interesting items, but most of the labels were in Italian (of which I know very little) except for a few proper Latin names. There was an interesting collection of semi-precious stones and of exotic marine shells, as well as beautifully preserved foreign butterflies. Specimens of the latter were on sale at prices ranging from £4 upwards.

Several types of monkeys were on view, as were turtles, snakes, lizards, iguanas, terrapins, alligators, large beetles, vampire bats, etc. There were some delightful little half-crown sized terrapins on sale for about 7s. 0d., and a selection of cage birds including parrots, budgerigars, finches, etc.

Obviously the fish were the most interesting animals to me. There were about eight tanks which were about 4 ft. x 2 ft. x 20 in. Only one of these was a coldwater tank and it contained an assortment of large comet-tailed goldfish. All of the aquaria had a base of white, synthetic aquarium gravel, and the marine tanks contained clumps of coral. Power filtration and aeration was used in every tank. The first tank to catch my eye was one containing about a dozen smallish sea-horses. Their comical antics were amusing a number of children who stood entranced. Another marine tank contained three large scorpion fish, about 10 in. in length. These were beautiful but vicious looking creatures. A third aquarium contained a shoal of the notorious piranhas, but they looked rather dull and gave no evidence of their potentially devastating habits. Several fully grown marble cichlids made a delightful picture in the next aquarium.

The most attractive fish were the three brown coloured discus which must have been about 8 in. in diameter. These were real beauties and would be rather expensive to buy. Only two kinds of plants were growing in the fresh water tanks. These were *Aponogeton* and *Cryptocoryne* species. Several plants of the latter had leaves about 10 in. long, by 4 in. broad, held on 12 in. stems. There were only four or five of these plants in each aquarium.

Milan's Terraquarium is well worth a visit if you have half an hour and 250 Lire to spare—and, of course, if you happen to be in Milan!

SOMETHING ABOUT VITAMINS

by Roger M. Winter

IN A RECENT ARTICLE I wrote for *The Aquarist* I made mention of the feeding of vitamins as a supplement to the staple diet of *Discus*. Numerous letters I have received all indicated that many of us are interested in the uses of vitamins in our hobby. Vitamins are substances required in very small amounts for the proper function of living forms. Other than this they have little in common as they are chemically dissimilar and perform many different functions.

For instance, Vit. B1 (Aneurine also known as Thiamin.) is necessary for the proper metabolism of carbohydrates in humans and Vit. A (Retinol Anerophitol.) is required for the maintenance of healthy mucous membrane tissue and each of the vitamins has a specific job to do. I could find little or no information relating to the function of any particular Vit. regarding fish and could not determine if vitamins are produced or synthesized in fish as they are in man and used for the same functions. To conduct the type of experiment necessary to determine this is unfortunately beyond my resources and ability.

No one knows exactly what components fish can absorb and which vitamins and minerals are necessary for fishes, well being. Any benefits that ensue from the feeding of these can only be assessed by experiment, taking care to notice and record the effects, if any, on the fish.

In my original article concerning *Discus* I mentioned only those vitamins that I had used in connection with them as you will appreciate that *Discus* can be just a little expensive to be used as guinea pigs in experiments of this nature, particularly when the results are uncertain. In the main my interests lie in Cichlids and it is with these other members of that family that the experiments were carried out.

It has been determined that certain vitamins are necessary to maintain fishes, general health. Primarily these vitamins are:—

1. Biotin (VIT. H)
2. Choline, Folic Acid. (VIT. M)
3. Inositol (Bios I)
4. Pyridoxine (VIT. B6)
5. Riboflavine (VIT. B2)
6. Lactoflavine (VIT. G)
7. Aneurine (Thiamin) (VIT. B1)

According to Cornelius van Duijn Jnr. vitamin requirements may differ from species to species. His book *Diseases of Fish* is the only one I can find that looks at vitamins and their importance in an aquatic light.

When one considers the unnatural conditions and environment to which we, as aquarists, subject our fish together with the fact that most of the conditions are artificial i.e. feeding, lighting and even rocks and plants, it is surprising that we do not suffer more losses than we do, or that we are able to keep fish alive for anything like their natural life span. Try to imagine how many other forms of life could tolerate these spurious conditions. Humans certainly could not.

In healthy fish some vitamins are produced or synthesized

by the fish themselves including Vit. A (Retinol Anerophitol) which is produced in the liver as is Vit. D (Cholecalciferol). An example of these natural vitamins can be found in Cod-Liver Oil. However, it has not been widely established what the food requirements are to enable fish to carry out this function. In their wild state sources of vitamins are unlimited; in aquaria they only exist if we put them there in some manner (plants etc.).

It is considered by many experts in this field that some medicants cause vitamin deficiencies particularly Aureomycin which affects Vitamins of the B complex especially B12, E, K. Indiscriminate use of Aureomycin could result in sterility as it can with the use of other medicants, sometimes only temporarily. This is by virtue of Vit. E (Tocopherol) being essential for fertility. I have experienced livebearer females 'dropping' the fry prematurely or reabsorbing them after treating them for fungus with a proprietary brand. I hasten to add that the strength used could be considered to be stronger than normal. The fish concerned, after feeding vitamin enriched foods, have once more produced healthy fry. However, I do suggest that where possible, before using any medicant, a determined effort is made to ascertain if any anti-vitamin effects will ensue with its use, and during or after treatments an addition of these vitamins is made to the feeding. Vitamins are food substances, therefore it is considered that dosage need not be very accurate in almost every case. Unless a deficiency is substantially proved, discretion or avoidance is suggested where fat soluble vitamins are concerned (Vits. A, D, K, and E) as these should be produced by the fish naturally.

Water soluble vitamins are soon absorbed so little, if any, harm can be done if the dosage is heavy (Vits. B, H, M and G).

Aureomycin speeds the growth rate of young fish and rumour has it that *Discus* reared away from their parents are treated in this manner. If adequate vitamins are made available the problems previously mentioned can be overcome. Also a lack of the Vits. B retards growth in young fish. Vitamin deficiencies (Avitaminoses) may effect different fish in different ways, but can by lowering a fishes resistance, leave it prone to many infections. A lack of Vit. B6 (Pyridoxine) is considered to cause hunger strikes and this has been determined in Angel Fish but could also easily apply to *Discus* and others. At the time of writing I have not had an opportunity to prove this personally. (I am very pleased to say!).

Cornelius van Duijn Jnr. states in his book that a deficiency of Vit. M lowers fishes' resistance to columnaris infections causing cotton-wool disease. This book I consider to be a must for any serious aquarist and is certainly one of the most thorough I have ever read. The author makes a very successful attempt to convey information and make available results and scientifically proved facts that would not easily be acquired by aquarists

such as ourselves and at 4/6 is worth every penny. End of Commercial!

Homo sapiens such as we are fortunate in having many vitamins added to our foods at source, but it has been proved that deficiencies of certain vitamins result in many unpleasant complaints (Rickets, Beri Beri and Scurvy etc.) and incorrect diets also lead to other unsavoury conditions, (Obesity, ascites etc.) so surely similar effects could be applicable to our fish.

From the experiments I have carried out and from those of a friend, A. Vernon Ashford, M.P.S., A.R.P.S., (to whom I am indebted for his translations of Technical jargon and devising a method of feeding vitamins) it appears that certain vitamins when included in their diet have beneficial effects. Ascorbic Acid (Vit. C) we find aids in feeding and is a possible inducement to spawn the Bs, particularly B12 (Cyanocobalamin), appear to improve colour and a healthy sheen has been observed on many fish that have been fed on them.

After removing the fry from a pair of *severum*, to save the female damage I separated the pair and for some considerable time was unable to get them together again. The female would spawn on her own with the male in view thru' a glass divider. She would spawn every eleven days and even when the introduction of the male was synchronised with the females scheduled spawning she would still not oblige and the outcome was the male giving her a hiding. When a supplement of Vits. C and E were introduced into her diet the previous behaviour ceased and they began to spawn regularly and care for the brood for up to six weeks before being separated. However, it is early days as yet an only time will tell if all the effects are beneficial.

A major problem was how to feed vitamins so that all fish would accept them.

The larger species such as Cichlids I found little trouble with; both Oscars and *severum* would take Vit. tablets like sweets. For other fish, particularly the smaller species, they had to be added to a food. The Proprietary Brands all contain Vitamins but unless we know all the sources of vitamins we are not much nearer as manufacturers only state a guaranteed analysis. Nothing should be added to these proprietary brands as they are scientifically prepared as a balanced diet and any additions could upset this balance. For this same reason two or more foods should not be mixed together; also only sufficient food should be purchased to last about a month as food tends to lose its value with age. To enable supplements to be fed a simple method can be employed, devised by Vernon Ashford. Bemax is an old established fish food and is rich in vitamins, especially those of the B complex. Unfortunately all fish will not accept it. If Protein in the form of meat is added together with vitamins we find most fish will. Care should be taken with feeding as Bemax tends to overload the liver and this could lead to internal disorders and any uneaten food being rich in proteins and carbohydrates will foul the tank. The vitamin content of any uneaten food, that is the Water Soluble Vits., will dissolve into the tank water and may still be absorbed by the fish through the gill membranes. Many aquarists may disagree but I believe in a fast-day once a week for my fish and consider it beneficial. The prepared food is fed on the following day, little but often is fed during that day so all the food is eaten. Where *Discus* are concerned I find that the majority of wild specimens will accept it with little trouble, some only if the meat used was

beef heart; however, I did not find any to be regularly stubborn. One pair of wild Heckel I have been able to feed almost exclusively on dried foods with only occasional live food supplements; this is something I have previously found difficult to bring about, and recently two pairs of Green *Discus* have started to accept dried foods regularly. It therefore does appear that if *Discus* previously would not accept dried foods, introduction to them via this prepared one can be successful. To minced meat is added sufficient Bemax to make the composite moist; to this vitamin tablets (crushed) may be added. Some vitamins are available in liquid form and these I find easier to blend in. Vitamins may be added altogether or individually to portions of the Bemax and meat mixture; initially I suggest they are added in small amounts. I also add Crookes Halibut Oil or Cod Liver Oil. It is then thoroughly minced together by machine (electric or hand) when all the ingredients are evenly distributed it can be spread out thinly on flat trays to dry. This can be achieved by placing it in an oven set as low as possible for 4 hours. Personally, I dry it over a storage radiator in the fish house; this is mainly to maintain an harmonious atmosphere with the wife. Ensure that the food does not cook as this will decrease the vitamin value as will contact with direct sunlight. When it is thoroughly dry it may be ground or broken up into the required sizes. It should be stored in small jars to restrict the inclusion of air, a sachet of dessicant silica gel (an agent to protect the food from damp and consequently mould) may also be included in the storage jars.

I hope this is of some assistance but I repeat that it should be fed little and often to avoid the prementioned troubles.

I would also like to take this opportunity to thank the many aquarists who wrote to me. I will answer all the letters but it will take a little time. I am delighted with the support offered for a Cichlid Assc. and with the help of others have begun the wheels turning in that direction.

My sincere thanks for the manner in which my attempt to convey information was received. My biggest surprise was the number of Aquarists keeping *Discus* and the even greater number interested in an Association.

OBITUARY

Mr. T. H. Marshall

Many aquarists will learn with regret of the death of T. H. Marshall at the age of 76 on December 10th last.

A dedicated aquarist for over forty years, he will be well remembered by our more mature readers as editor of the pre-war "Fishkeeping," as an author of several books and as the proprietor of Marshall's Goldfish Hatchery at Marlow in Bucks. In latter years his business activities were conducted from Marshall's Aquaria at Buckhurst Hill, Essex.

Mr. Marshall had not enjoyed good health for some years before his death but until ill-health overtook him was very actively engaged in Fishbreeding and writing books on the finer aspects of this subject to which he had devoted his life.

KEEPING AND THE BREEDING OF THE *KRIBENSIS*

by Bob Gardiner

IT'S PROBABLY TRUE to say that most aquarists eventually form an affection for, or become interested in, a particular order of fishes or a particular species of fish within that order. Many factors may determine this interest or affection not the least being beauty, and all aquarists have their own particular idea of beauty, and while I must confess that my all-time favourite is the Siamese Fighter, I have a high regard for certain species of the Dwarf Cichlid group. As I have said all aquarists have their own particular idea of beauty and of all the Dwarf Cichlids I've kept or bred, in my opinion the most beautiful is the male *Apistogramma agassizi*, and I've always felt rather sad that the female is, by comparison, so small and insignificant. So if I were asked to pick the most beautiful pair of Dwarf Cichlids I'd unhesitatingly plump for *Palmatichromis kribensis*.

Although a little smaller than her mate the female *kribensis* suffers little by comparisons of beauty with him; in fact, I've heard many aquarists swear that the female is more beautiful than the male. Coloration may vary somewhat in individual fish, even from the same spawning, but generally the body of both sexes is chocolate in the upper part, ivory on the flanks. The male's ventral fins are violet; the female's are wine-red, with blue leading edges in both sexes. To me the most distinct features are the gold-leaf edge on the dorsal fins and the brilliant wine-red patch on the sides.

Sexing adult fish is no problem, the male being the larger and slimmer fish, about 3½-3¾ inches long; females are slightly smaller and more chunkily built. There is one other sex difference, although this is not always present even in males from the same brood, and that is dark spots on the tail, up to seven in number. I once tried to explain to another aquarist about these spots, telling him that if the fish had tail spots it was definitely a male, but it could be a male even without the spots—he retreated in confusion! However even if no spots are present the upper part of the male's caudal fin has a distinct gold edge which may be discerned even when the fish is only about 1 in. long.

It's not only its undeniable beauty, however, which makes the *kribensis* worthy of a place in any aquarist's collection; in my experience they present no great difficulty in keeping or breeding providing some basic simple rules are followed. As proof of this at the moment I have them living quite happily both in mixed communities and in tanks containing only their own kind.

Kribensis are native to Tropical West Africa and are found, among other places, at the mouths of the Niger Delta. This would suggest that some salt in their aquarium might be essential, and in fact many reference books make this point. However, I have had no difficulty in keeping them in perfect health and inducing them to breed under

ordinary conditions without ever having to use any salt whatsoever. Providing my fish are healthy and willing to breed in the conditions I provide, I let them get on with it. Only if these conditions appear to be of such unsuitability that the fish are obviously unhappy or distressed, do I worry about pH or hardness.

My *kribensis* (or perhaps I should say "our *kribensis*", because I share my fish-house with another aquarist) appear to have a fairly wide tolerance of hardness and pH because our breeding pairs breed in any tank we happen to have handy and their offspring are often moved from tank to tank whenever necessary without any ill effects, even when quite small. What I do feel is essential for their well-being and comfort is a water temperature of 80°F and a well planted aquarium with plenty of hiding places of rocks or flower pots. In sparsely furnished tanks they become nervous and lose their colour.

Breeding has presented no great difficulty; in fact we have found them to be one of the easiest species of all. What has been of great interest to us, however, is the process of selection and subsequent breeding behaviour of two different pairs of *kribensis*. We began the whole *kribensis* project with the acquisition of about eight young fish, survivors of a spawning in a community tank. It became fairly obvious when they were just over 1½ inches long, that we had three males and five females; two of the males had tail spots the other had none. They were kept together in a well planted 24 in. x 15 in. x 12 in. tank. I would add here that all of our plants such as *Echinodorus* and *Cryptocoryne* are potted in loam. We have discovered the hard way, that when young fish have to be sorted out into different sizes for growing on in other tanks or individual fish have to be netted, that it is much more easily done if the plants can be removed and replaced without any trouble and potting facilitates this operation. As a side issue, potting also leads to better individual specimen plants. These are only personal opinions, however.

Our eight *kribensis* were fed on a mixed diet of earthworms, scraped beef and calves' heart, crab meat, cod's roe and the better blends of proprietary fish foods. Six of them grew quite rapidly; these were three males and three females, but it became obvious that the other two were runts which would be of no value. A description of the three males sounds like something from a fairy tale. There was the big one, the medium-sized one, and the one with no spots on his tail. The three females likewise, the big one, the medium-sized one and the little one.

The two runts were removed to another tank, leaving the six described above, four of which, two males and two females began to show some interest in each other. As time passed this interest became intensified and the males began

to chase the females. The females shimmied (for want of a better word) in front of the males, arching their bodies sideways until their noses almost met their tails; all four began to glow with colour, the dorsal fins gleamed gold and the wine-red patches on the flanks glowed brilliantly. Eventually the two pairs laid claim to the areas in and around two flower pots, but the most interesting and surprising thing was the pairing off of one particular pair. This was the largest male with the *smallest* female. They presented an odd combination and to us an unlikely one, but we decided that they knew best and to let nature take its course. The other pair seemed reasonable enough; this was the medium-sized male and the medium-sized female. The remaining two fish, the largest female and the male without spots on his tail showed no interest whatever in each other.

The two selected pairs were now removed to separate 24 in. x 15 in. x 12 in. tanks where, after settling in, the medium-sized pair commenced to excavate holes in the gravel. The large male and the small female, however, did not do anything in particular. The male seemed keen enough but the female was reluctant and after some time he began to lose patience and became more aggressive towards his small mate. Eventually we decided to remove her and substitute the large female. This turned out to be the perfect match. They made ideal parents when they did eventually spawn and both looked after the young and though the broods are small, from 40 to 50, they are strong and healthy and well coloured with very few runts. The other pair also produced good broods but here we have to keep a close watch on the male as he is unreliable and unpredictable in his role of father and has to be removed after spawning has taken place.

Despite the fact we are rearing large numbers of *kribensis* from both breeding pairs, we have never actually witnessed a spawning taking place. We know when one is imminent from our observations of the behaviour of the parent fish. This consists of digging pits in the gravel, hiding away, and only coming out to feed; but usually our first certain indication that a spawning has taken place is when the parent fish appear, shepherding the fry round the tank usually from one hollow in the compost to another. In the medium pair, we know that a spawning has taken place when we see the female driving the male to another corner of the tank. She has a definite warning attitude towards the male which consists of a backwards and forwards movement as she faces him. She moves to and fro, making occasional darts at him if he shows any inclination to venture too close to either eggs or fry. With the large pair we have a direct contrast; all is sweet harmony and we can leave both fish to look after their brood, and these contrasts of the different forms of parental behaviour are most interesting to observe.

Feeding the fry presents no great problem. We have never found it necessary to add infusoria to the breeding tank. In the mature tanks we use there is always an abundance of microscopic food available and we merely add brine shrimp, microworms, screened daphnia and fine dried food whenever we see the fry in the company of their parents.

As I said earlier, breeding these beautiful fish is no problem. Whenever the fry are large enough we remove the parents to any tank which happens to be available where, after a rest period they spawn once again. One point we have observed, whenever the parents are removed the fry disappear for a couple of days and then reappear once more.

The first time this happened it was a bit disconcerting as we thought we had lost the spawning, but now we expect it and no longer worry about it.

Some final notes on our experience with *kribensis*, but before giving them I would hasten to add that they may differ from other aquarists who may argue "that's not my experience of *kribensis*"—but that is fishkeeping. Many aquarists have their own methods of breeding the same fish which may vary in details but on closer examination usually have the same basic essentials. In my opinion, whatever method is used is unimportant; the real yard-stick of success is the fact that the fish in question are induced to breed and the quality of the young fish produced from a successful spawning. Note that I emphasise quality rather than quantity. I would rather raise a small number of first class fry, than a large batch of rubbish.

But back to the final notes . . .
Well planted tanks with plenty of hiding places, a couple of inches of compost, not too large a grade or the fish may have difficulty moving it while digging their pits, or too fine a grade as this will run back into the pit. We use a proprietary grade of compost and find it quite suitable. If potted plants are used, or even rock work, it is most important to make sure that these are bedded well into the compost or they may tilt or topple when the *kribensis* are busy excavating. Water hardness and pH are not critical, as long as they are not extreme. The addition of salt we find unnecessary, but we think it important that the water temperature should be about 80°F.

These simple basic principles are all we have found necessary to keep and breed these beautiful fish successfully.

FISH FOOD REVIEW

"Gussie" Fish Food Flakes, made by Armitage Bros. Ltd., of Nottingham.

This fish food, in flake form, is available in two varieties, one for tropical fish and one for coldwater fish. The tropical flakes cost 1s. 10d. for the standard size, 2s. 8d. for the large size, and 5s. 11d. for the breeder size. Each size is good value for money, especially the breeder size which contains 1½ oz. (42 grams). The tropical flakes have an analysis of 46% protein, 5% fat, and 8% fibre.

Having a relatively high protein content, the food makes a good staple food for most fish, especially the larger ones, as it contains a large proportion of larger flakes. For smaller fish, it would be necessary to crush the food. This is easily done with the finger and thumb. The food does not cloud the water and may be fed to the fish twice per day as much as the fish will eat in five minutes.

The food has the advantage that it floats for a long time, partly due no doubt, to the proportion of relatively large flakes. For the same reason, the flakes, when they sink, do so slowly enough for the fish to catch them before they reach the bottom of the tank. All of the fish to which I fed the food, appeared to be very keen on it—even small fish, for which the food had to be crushed.

I have not tested the coldwater type, but it costs 1s. 2d. for the standard size, and 1s. 9d. for the large size.

B.W.

WHAT IS YOUR OPINION?

by B. Whiteside



"AS A BEGINNER reading your magazine, I find that there are too many different opinions by so-called experts which would tend to put some beginners off—unless your magazine is for experts only."

These words come from a letter from Mr. J. S. Mehaffey, of 64 Mayflower Street, Belfast 5. I use them to open this article in the series because it would appear that Mr. Mehaffey has not grasped the point of the series. This is not too difficult to understand, as the series has been going for some time, and I have not stated its aims recently. The aims of the series, I would say, are to get the opinions of a variety of aquarists, not all of whom are experts, on a wide variety of topics. Keeping this point in mind, it can be seen that the views expressed in this column are not the laws laid down by experts, but the views, based on personal experience, of the ordinary home aquarist such as myself. I feel that the hobby has, for too long, been dominated by the findings of a few experienced experts who have published standard works on the hobby. Many of their findings have gone unchallenged and have been taken as rules for success. From the contributors to these columns we have been able to get a wide spectrum view of many different facets of the hobby, and these fresh views have caused many other people to question some of the standard practices and to modify their views to their own benefit.

As the Editor states at the front of *The Aquarist* that he accepts no responsibility for the views expressed by contributors, the point is that the views expressed are not laws or rules, but personal opinions or findings by the contributors. I would certainly not agree with all the views expressed in this column, but I certainly find them stimulating in that they encourage me—and others—to think and to re-evaluate their own opinions. This column does much more than this, but if this were its only result, I would still feel that it served a very useful purpose. (Does this make me sound like a typical school teacher?). This feature is open to anyone from the beginner of a few weeks to the experienced aquarist of many years, to express their personal views, and if one accepts this fact then one cannot contend that "there are too many different opinions by so-called experts", and certainly the magazine is not for experts only. Surely, it caters for the whole spectrum of those interested in aquatic topics, and more.

To prove my point I will continue with Mr. Mehaffey's opinions, this time on the subject of freeze-dried fish foods. Mr. Mehaffey tells us that he is a beginner to tropical fish-keeping, having started the hobby in October, 1968. He says that, like most beginners, he tries everything on the market, foods, fish plants, etc. He bought a container of freeze-dried tubifex worms to try with his fish and, having tried two cubes, he threw the rest out.

The reason was that his fish seemed just to break off pieces of a cube and then spit them out. The result was a very cloudy tank with none of the worms being eaten. He now sticks to ordinary dried foods with the occasional feed of live daphnia or tubifex.

Mr. J. A. Higham, of St. Helens, Lancs., has also some complaints to make. He begins by saying that he is almost discouraged from writing this month by the very acid comments drawn by our efforts of December. He says: "Surely the nature of this column is implicit in the title—all we are doing is expressing our personal opinions, with no desire to be at all dogmatic." Mr. Higham goes on to say that he, for one, had no intention of disparaging the coldwater fancier; in fact he kept and bred goldfish as a start in the hobby before going tropical. He states that Mr. Hunt would probably consider this as a case of the cart before the horse and he may well be right. Mr. Higham admits that his only excuse was pure ignorance. On the point of his being accused of not having done enough reading on the subject, he finds this comment to be the unkindest of all after his recent call for more books on fish-keeping. In spite of all this, he thinks that no one would dispute that there are more tropical fanciers than coldwater ones and this was, after all, the point of the exercise. One point which he says has not yet been mentioned on this subject, though hinted at by Mr. Hunt, is the popularity of tropical fish-keeping in the North. He thinks that we may be on to something here, and he is prepared to put it down to the lack of clean streams and other waters in these despoiled industrial areas. He asks if there is a subject for discussion here!

This leads Mr. Higham on to answer another question posed. It was the lack of natural beauty round him which prompted him to take up fish-keeping as a hobby. What better way is there of having one's own bit of wild life and scenery, permanently preserved, in spite of the ever advancing sea of red brick, over the countryside? Although it is not talked about in this way, Mr. Higham thinks that many people in his area subconsciously feel the same way as he does on this subject. Rightly or wrongly he decided to start with goldfish, and before doing so, he read all that he could get hold of on the subject. Armed with a little knowledge, he then obtained two or three all-glass tanks, size 14 in. x 10 in., under gravel and outside filters, and a piston pump. The three 2 in. goldfish which he bought, turned out to be a female and two males, and he loved them so dearly that they soon repaid him by spawning and sparing the lives of six tiny fry. The moment when Mr. Higham first saw those fry was the moment when he became "hooked" on fish-keeping. It was not long before he wanted to

try tropicals and these also started in the small all-glass tanks, before he bought a 3 ft. x 15 in. x 15 in. tank. For a long time he has preferred a separate heater and thermostat. He finds outside thermostats to be very handy and has had no trouble whatsoever with them to date. His 25s. Od. type seem so well made that he has never installed any safety devices. "Foolish?" he asks.

Rabbit droppings are recommended by Innes and Mr. Higham has used them to encourage plant growth without the slightest harm to any fish, although he admits that the plants did not show the slightest improvement in growth. The plants were various small *Cryptocorynes* in pots, each containing a different type of fertilizer, but he honestly could not grade the results in any way. The same inconclusive results apply to the next query, on the growth of Amazon swords grown with under gravel filters. Here, again, he can find no difference, having grown them in both conditions in the same tank. Mr. Higham suggests that the result may depend upon the type of under gravel filter used. His only experience has been with the tubular type which, no doubt, leaves more space undisturbed than the all-over type.

On the question of veteran fish, Mr. Higham says that he has not been keeping fish long enough to hold any records. The oldest in his tanks are about five years, plus whatever they were when he acquired them. At this age, he has a few survivors from pairs—a large angel, apparently in the prime of life, and a very hale and hearty tiger barb which he bought as a "nipper" at the B.A.F. show in 1964. Only slightly younger are a couple of lemon tetras, and a harlequin, none of which seems to be ageing in the slightest, though pairs of black widows of the same age show signs of seniority in the loss of their black coloration. Mr. Higham poses a question at the end of this article.

Mr. N. Gray of Galmpton, Nr. Brixham, started fish-keeping at the age of nine, after seeing our old friend the guppy. A master at his school brought in a gravid female and during the day it gave birth to a dozen or so babies. This fascinated Mr. Gray so much that he asked the master about them and he gave him a pair and a small tank. On the question of filtration, Mr. Gray believes that it is, or should be in most cases when talking about hobbyists, unnecessary. Mr. Gray only uses filtration when he has set up a new tank, or when a tank has no plants or gravel. Having tried most types of filter, he favours the old type top corner filter which he finds is easiest to clean and replenish. It can be cleaned in a few seconds without disturbing the tank in any way. This type of filter is not so useful in a larger tank with large quantities of fish.

An improvement which he would like to suggest to some of the manufacturers is that they modify the siphon tube, i.e., do not stick the air pipe to the upward lift as this acts like a type of bi-metal strip and causes the tube to curve away from the vertical. Mr. Gray has had tanks in a greenhouse and indoors for quite a few years and the only time he can remember having to use a filter was, when before going on holiday one year, he put a load of daphnia in a tank with only a few fish and when he returned home he found that most of it had died before being eaten. His tanks may not look suitable for an exhibition, but the

plants grow like wildfire, the fish are in excellent condition and the water is as clear as crystal. He does not want to start talking about plants again but he would have thought that, in a well-balanced tank, filtration should not be necessary except, perhaps, when it is first set up. On the question of old fish, Mr. Gray's was a black shark which grew to a length of 11½ in., and which he kept for about ten years. This particular fish was bought in London, moved to Northampton, back to London, to Surrey and then to Devon, taking all changes in conditions without any trouble. The last time it was moved it was about 10 in. long and stood a journey of ten hours. The second oldest fish is a *Corydoras aeneus* which he has had now for nine years and it is still going strong. Another black shark is now seven years old.

Mr. S. Fox comes from Newcastle-upon-Tyne, and he thinks that under gravel filtration undoubtedly does have a detrimental effect upon Amazon sword plants and that, although it is not fatal, growth is retarded. In the autumn and winter the full effects are most apparent because the plant has been partially deprived of food during the peak of the growing season, the summer. The reason, he says, for the partial loss of food, is that water plants take in through their stems and leaf tissues simple inorganic food materials in solution form; these are later converted into organic substances which the plant uses as food. Part of these substances is used to form or create cellulose and the cellulose is used to form new cell walls and to strengthen old or existing cells. In this manner, the plant feeds and adds new growth to its body form. This is in addition to the intake of inorganic food substances which the plant, and the Amazon sword in particular, absorbs through its root system. By its action, the under gravel filter causes the tank water, and therefore the food materials, to be continually washed away from the roots of the sword plant. In other words, the inorganic food substances cannot settle round the root system to be absorbed. In his view the "whiter than white" appearance of the root system (which is a characteristic feature of plants where this type of filtration is used) to him, at least, indicates that the sword plant is being partially starved. The white appearance of the root system, which seems to be much admired by aquarists and regarded as a sign of good plant growth, is simply not true in the case of the sword plant however true it may be regarding the growth and health of other species of plants but even in these cases, Mr. Fox has his doubts.

Mr. C. Francis, of Stalybridge, Cheshire, has some experience of undergravel filters and Amazon sword plants. He first bought an Amazon sword plant as a centre piece for his newly set-up 36 in. x 15 in. x 12 in. tank which had two under gravel filters of the plate type, situated at each end of the tank, and leaving a small space, about 2 in. wide, in the centre of the tank with no filtration under the gravel. In this space, a 4 in. high Amazon sword plant was planted. It was then left for about three months during which time it neither grew nor died down; it just existed. At this time he was feeling rather disappointed and moved the plant to a smaller tank. This again had under gravel filters and the

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plant was planted over the top of a plate type filter. He now noticed that it was deteriorating fast. The leaves first became very pale and to remedy this he increased the lighting but, to no avail. The leaves then proceeded to shrivel up and turn brown and it was at this point that he stripped down the tank and examined the plant closely. He saw that the roots of the plant had rotted away and so he discarded it. Being keen to have Sword plants in his tanks after seeing his friend's attempts, he decided to try his luck again. This time he planted a similar sized plant in an established tank which again had under gravel filtration. He was still 'sold' on the idea of under gravel filters at this period. The type of under gravel filter in this tank was the tubular type and not the plate type. He again planted the sword plant in the centre of the aquarium and sat back full of confidence to watch it grow. Again it deteriorated very quickly. By this time his confidence was shattered and shrivelled like his Amazon sword plant, but on examination of the plant he found, amongst the remains of the rotted roots, what appeared to be one small, healthy leaf left and he decided to knock off his under gravel filter and substitute outside filtration, leaving the under gravel filter in place. At first nothing much happened except that bubbles of gas escaped from the gravel where it had been disturbed. After three anxious weeks of nail-biting a miracle happened. The plant began to grow! At the side of the beshrivelled wreck, a leaf had begun to grow. This continued to grow until it had reached a height of 4 in., during which time more leaves had appeared at the rate of one per week and a half. After it started to grow, there was no stopping it; it just simply grew and grew, until it was a giant over 2 ft. in length. The leaves which grew now completely covered the top of the 24 in. x 15 in. x 12 in. tank and overshadowed every other plant in the tank. These slowly died away due to lack of light. (Or may it have been due to starvation? B.W.). The leaves of the sword were, at this point, around 3½ in. wide, and about 2 ft. long, and they were appearing at the rate of about two per week. This all took place in about 6-8 months, and at the end the tank was just a large plant pot for the plant.

His initial disappointment had turned to delight at the growth of this plant and had then turned to near despair at the size to which the plant had grown. It was now apparent that the plant needed even bigger quarters and he decided to get rid of it. It was now uprooted from the tank, lifting over half of the gravel with it, wrapped in two sheets of newspaper, and given to a highly-delighted brother in law along with a couple of hundred snails which were using it for a home/come breeding ground. It was planted in a 4 ft. x 18 in. x 18 in. tank in which it took up quite a large area in one corner. The quite laughable experience left me drawing the following conclusions:—firstly, that the Amazon sword plant either, as suspected by other people, does not like water circulating around the roots (but can this cause them to rot?), or, secondly, that the roots of the Amazon sword plant are not resistant to the increased bacterial activity induced by under gravel filters, or, thirdly, that the break-down products from the bacteria are harmful to the roots of the plant. Mr. France suggests

that maybe some enterprising post-graduate would do some original work in this field to the advantage of all Amazon sword plant lovers. His last suggestion is that, when the under gravel filter was stopped, the amount of waste which it had accumulated in the gravel, was the producer of a rich medium which fertilized and fed his shrivelled dwarf to become a giant which flowered and produced aerial runners which formed several new plants on the surface of the water.

An interesting letter came from Mr. Wayne Kruper, of Willowick, Ohio, U.S.A. It is interesting to note that, on the other side of the world people read our column. Mr. Kruper sums up his experiences of filtration with the phrase: "think BIG". By following this advice he says that anyone can have a crystal clear, odour-free, maintenance-free aquarium system. His aquaria range in size from 50 to 200 gallons. They are densely populated with oscars, Mylossamas, Schwanenfeldis, assorted catfish, angel fish and barbs. He feeds them heavily with frozen liver, gold fish pellets, and a popular brand of concentrated cereal, to maximize growth, and promote health, colour and vigour. His only task is to add water to make up for evaporation and a semi-monthly 20% water change to keep the soluble nutrients at a low enough level to discourage the growth of brown algae. He adds chlorinated water directly from the tap to his tanks for this topping up. He has experienced no difficulty with this level of chlorine. His filters are under gravel coupled to outside ones or outside alone. His preference for a filter with his large rough fish is an outside filter. Filter medium is ¼ in. silica gravel. No charcoal or filter wool is used. The aerobic bacteria colony established in these filters do an adequate job in digesting the fish wastes and uneaten food.

The secret is size and flow rate; size, to ensure adequate volume capacity, sufficient surface area to slow down the through-put velocity, and adequate flow to ensure aerobic conditions. One needs one foot square of surface area for each gallon per minute of water flow. He has found that a filter of two square feet of surface area, a nine-inch bed of gravel, and a two gallon per minute flow of water is adequate for a 100 to 200 gallon system. This filter is good for years of use with only an occasional raking of the surface to break up a crust which forms.

His tanks and filters are constructed of exterior grade plywood coated with polyamide catalysed epoxy paint, and sealed with epoxy paint or silicone rubber. The glass is cemented to the inside front with silicone rubber. The filter is an integral part of the back of the tank. Pipes go through the wall of the tank and filter and no siphons are needed. The airlift is a ¼ in. I.D. vinyl tube or pipe, with a vinyl air line cemented in at the 28 in. level. 150 cubic inches of air will pump 2-2½ gallons per minute, through this air lift. This will require a minimum of two ¼ in. I.D. pipes to keep the filter full. Diffuser plates for the filters were constructed from styrene decoration panels, with ½ in. holes drilled on ¼ in. centres, and held in place above the bottom with posts of plastic pipe. Mr. Kruper, whose full address is 30308 Thomas Street, Willowick, Ohio 44094, says if interest is aroused, he will, at a later date, elaborate on construction details, materials and cements.

Bramhall, Cheshire, is the home of Mrs. Margaret

Machin who is proud of the longevity of the fish which she keeps and she tells of a mated pair of shubunkins which she owned and which lived for 16½ years, in the case of the male, and just over 17 years in the case of the female—a red and black specimen. There was no apparent disease to account for their deaths, so it can be concluded that they died from senility. These fish produced thousands of offspring during their long life, but it is interesting to note that not until the year before they died did they ever produce any blues, and then very few. All her fish live in a garden pool during the summer, and are brought indoors into aerated, filtered tanks during the winter months, so that they do not 'hibernate'. They are fed each day on 75% live food, have been singularly free from disease (she has never seen fungus) and the bulk of the fish live for about ten years. Naturally they have become very tame and as they are pets which she knows individually, she takes a keen interest and records their births and deaths. Mrs. Machin first started fish-keeping with the above pair of shubunkins which her husband bought for her to mark her success at a large flower show, where she won a silver cup with her roses. Unlike a lot of females, she preferred the fish to diamonds, and still does. In January, 1968, Mrs. Machin rescued three freshwater shrimps from a bunch of watercress and put them into a small tank in her kitchen, in case of emergencies. Although she lost two after about three months, one is still alive and flourishing amidst the plants and other minute pond life.

Mr. F. Orme of Birmingham has been a goldfish enthusiast and breeder for twenty years, during which time he has kept and bred most of the available types. He writes in respect of one or two points made by previous correspondents to this column. On the question of whether or not coldwater and tropical fish-keepers are rivals, Mr. Orme says NO! If an aquarist is serious, then both have a different outlook on the hobby. The tropical man is interested in the bright colours and in spawning the difficult fish. Having succeeded, he has youngsters which are an exact replica of the parents. He also finds it easy to establish a strain in a shorter time than the goldfish breeder. This is due to the tropical maturing earlier than the coldwater fish. (I only wish that I could get a good pair of guppies to produce exact replicas of their parents. B.W.). The goldfish breeder usually concentrates on one or perhaps two varieties. These are notoriously difficult to breed true, therefore, every season brings renewed anticipation that this time he may have the perfect fish, and each time he is disappointed so he starts to make plans for the next season. Mr. Orme feels that a former letter writer, Mr. Molyneux, should be corrected, and he states that orandas, moors, lionheads, fantails, etc., are not semi-tropical, but are coldwater fish. Mr. Orme's twintails, lionheads and orandas, winter in an outdoor fish house, and their tank often has ½ in. of ice on the surface. Yearling fish are given the same treatment without ill-effects. On the question of coldwater fish, Mr. Orme feels that the most sensible replies came from Mrs. Taylor of Liverpool, and Mr. Hunt of Portsmouth A.S. Mr. Orme says that he did not see the question which started the correspondence, as a recent copy of "The Aquarist" was the first aquatic magazine which he has purchased since the time that the old "Water Life" ceased publication.



Pearl-scale Fantail

Master D. Pugh, of Melton Mowbray, is 15 years old, and he feels that he must write in defence of coldwater fish. He has kept coldwater fish for quite some time now, and although the majority of them were goldfish he has had quite a variety. Although his finances have never been large enough to provide him with all the paraphernalia necessary for keeping tropical fish which puts him in no position to compare the two he holds coldwater fish in high esteem. He feels that there are few things more beautiful than a male stickleback in full breeding-season colours, or a shoal of small perch with fins all out-spread, or even a moor or a veiltail. He has two small ponds and he likes sitting by them in summer, watching the fish. This cannot be done with tropicals, not with the summers we get. He also finds that coldwater fish can be put in more natural environments without the space being cluttered up with heaters, thermostats and often necessary filters, as he sees in his friends' aquaria. Regarding the sale of coldwater fish in his town he does not have a dealer who specialises in fish, but two pet shops. Of these, one sells coldwater fish only, and the other sells tropicals as well. The coldwater fish are restricted to various varieties of goldfish, and sometimes some coldwater catfish of various shapes and sizes. Other fish Master Pugh or his friends catch around Melton where they have two rivers and one or two nice brooks. This, then, is the situation where he is, and he thinks that keeping coldwater fish seems a much greater achievement, especially when one catches the fish one's self. Master Pugh wants to get some Koi Carp when he can find the money and the source of supply. He feels that if he can get these it will be an even greater achievement.

The last letter comes from regular young writer, Master Peter K. Brown, of Wrekin College, Wellington, Salop. He was very pleased to note that there were so many replies from the coldwater side of the hobby. He found the reasons for people keeping these sorts of fish very interesting, but he found room to disagree with one contributor, Mr. P. Pearce, who wrote in the May edition of "The Aquarist":

Continued on page 132

"... who wants to see an aquarium in a room, hidden away in a corner, with, apparently, a large number of small, squirming fish, which require one to screw up one's eyes, or practically put one's head through the glass, to see the fish amongst the weeds". Master Brown has nothing against the writer who is expressing his opinion which is what this column is for, but he thinks the description is rather unfair as he doesn't think that many people keep fish in the conditions as described here. If they do, Master Brown is sorry for them, and even more sorry for their fish. Another point which was raised was whether or not coldwater and tropical fish-keepers were rivals, and Master Brown thinks that, at the moment, they are very much rivals but as shows have more and more classes for coldwater hobbyists, the two groups are becoming more reconciled to one another and this is the way it should be, the two groups working in harmony. After all, we do have the same interest!

On the question of combined heater and thermostat versus separate ones, he finds that both types are very good as long as reliable makes are used. The combined type is very good where only small amounts of water are used as the normal type of thermostat would need an amount of adjustment to be able to operate on its side. Otherwise he thinks that both types are very good. On the question of safety devices for the aquarium, Master Brown has read about many, but none can put right a fault like a power cut or a heater burning out. The only advice which he offers is to buy good makes of electrical equipment and to keep a constant watch on them. He has never used rabbit droppings as an aquarium plant fertilizer, but he has used many of the commercial brands available on the market, all of which have given good results. For good plants, Master Brown recommends putting a layer of peat under the gravel and raising the temperature of the water a few degrees. This has worked wonders for his plants. As regards cement ornaments, during his holidays he has set up many tanks for people and shops and he always uses cement ornaments. He has never soaked any of them and no harm has come to the fish. He adds one point of warning. If the ornaments are home-made, the precaution of washing them well, and soaking them for a few days in a solution of slaked lime, followed by a good washing, should be taken. (I wonder if Master Brown has got his facts right here? Slaked lime, or Calcium Hydroxide, is a strong alkali, and surely contains, in concentrated form, the very components of cement ornaments which one would want to remove from them. Slaked lime would have a disastrous effect on both fish and plants. B.W.)

Master Brown goes on to say that he first began to grow Amazon swords in a tank with under gravel filtration, but had no success. He tried many swords with this type of filter but soon came to the conclusion that plants of this type will not tolerate water being passed through their root systems. He now grows the plant well in water with a p.H. 7.3, and D.H. 3°. The temperature is 76°F., and the plants are grown in a 2 in. layer of gravel with a bed of peat. 100 watts of light are supplied for 10 hours per day. The oldest fish which the writer has kept was a neon which was about five years old when it died. A lot can be said about filtration, but the most important thing is that the filter media should be changed as soon as they get dirty. The air line and the amount of air going to the filter should be correctly adjusted to get the best flow of water through the filter. One should also remember to use a filter which has a

capacity suitable for the tank in which it is to be used. This point is often overlooked.

Mr. H. J. Gilbert, chairman of the Southampton and District Aquarist Society, writes about one of my correspondents who deplores the lack of specialised questions. Mr. Gilbert agrees with my reply but suggests that anyone who has a 'super-scientific' question has probably gone into that particular aspect of the hobby more deeply than the average aquarist. The remedy is to set it all down on paper and have it published, and the chances are that many critics will come forward to tell where he has gone wrong. By doing so, they will, perhaps, indirectly answer the question. Mr. Gilbert also asks if I have ever heard of this column being used as a programme aid. In his society's meetings, they always include a 'Question and Discussion' (not answer) period. Some of the topics which I raise the society find to be ideal talking points. (I'm pleased to hear that the idea is useful to your society's members). Mr. Gilbert asks a question about the economics of a fish house for the aquarist on a limited budget. His own fish house, which is a conventional asbestos shed and lined with 2 in.-3 in. polystyrene, hardboard sheet and, finally, polystyrene tiles, is 12 ft. long, 6 ft. wide, has shuttered lights in the roof, has a small work bench and is heated by a thermostatically controlled fan heater to 72-82°F. air temperature. It holds 28 tanks of various sizes, and uses an average of 5 units of electricity per day, during the coldest months of the year. It has fluorescent, low voltage, and ordinary lighting available for winter use. Do you have any experiences of running a fish house on a limited budget?

I will end with a few questions for the next article. Having had several unfortunate experiences with expensive guppies ordered by post from breeders in England, I should like to hear if any other readers have had similar experiences of ordering guppies which, when they were delivered, turned out to be of a very poor quality or, after having raised a batch of youngsters from a reasonable looking pair of 'true breeders', found that the offspring were fit only for true feeding to angels and the 'true pair' had obviously nothing in common with anything except the wild guppy? Many of my guppy breeding friends here in N. Ireland have had similar experiences and we wonder if this practice is reserved for the supposed 'gullible' Ulster people or if it is a common experience for anyone who has expensive guppies sent to them? (a) What have been your experiences of ordering good quality, expensive guppies by post? (b) Have you had any experiences of keeping, feeding and breeding red-finned black sharks? (sent by Mr. France). (c) What features do you enjoy most in aquarists' magazines, and what missing features would you most like to see included? (d) How do you keep plants clean? (sent by Mr. Higham who says: "No matter how well my plants grow, and no matter what type of filtration I use, I always get settlement on the leaves of my plants. This is unsightly, if not inhibitive to their growth. I would blame it on boisterous fish if I had not seen tanks in Chester Zoo containing equally vigorous inmates together with beautifully clear plants"). (e) What, do you think, is the cause of split fins in male guppies? (f) Do fish-keepers in general, like myself keep other pets as well? (g) How can one clear a tank of floating duckweed?

The State of the Marine Hobby

by Graham F. Cox

Graham F. Cox is the Head of the only professional marine-specialist organization in the world. His young company is dedicated to the mass popularization of marine aquarium keeping, the gentle de-banking of the many contemporary fallacies afflicting the hobby and the research, manufacture and market of effective aids to good fish culture.

Because of the unique nature of his business, and the fact that he is so inextricably entwined with this, the fastest-growing aspect of the aquarium hobby, it is likely that total impartiality may be impossible for him. Nevertheless, and despite the volume of criticism which the publication of this article may produce from other interested parties, we feel that its value to our readers justifies its presence here.

The Editor.

I THINK it was Lord Montague of Beaulieu who wrote that, in the few years from the invention of the internal combustion engine until the year 1900, man struggled to make the horseless carriage simply go. From 1900 until circa 1905, he endeavoured to make it go well, and from 1905 onward he has only been refining and improving on a basically good idea. The temptation to compare this state of affairs with the development of the marine hobby is irresistible. I am convinced that 1969 will be recorded in the annals of aquariological history as our 1905—the turning point that marked the end of an era of heart-breaking and frequently expensively abortive experimentation. It must not be assumed that I am saying that the future will be a bed of roses. There have been many thoroughly badly designed motor cars and auto components produced since 1905 and I'm sure that we shall have our temporary setbacks also, but the point in time has now been reached when a man can walk into the premises of a reputable business and, on receipt of sound advice, purchase equipment and marine life forms which, if the man has absorbed the advice and acted on it, will have at least as good a chance of success as their freshwater counterparts.

I believe that 1969 is the year of the Marine Tropical Aquarium. A quick review of hobby magazine articles and advertisements since the formation of the world's first Marine specialist business in October 1968, until the present date, shows considerable evidence of the enormous mushrooming taking place. I hope that the following will clarify some of the confusion that exists in the ranks of the uninitiated.

NEW PRODUCTS

i. Heat Control Equipment.

After struggling for a considerable time with a combined heater and thermostat which, although of brilliant design, had initial teething problems, the well known *Uni-Pet Ltd.* have now produced the fabulously successful Mariner 100,

Combined Heater/Thermostat with a wide range of heater wattages and extremely-adjustable thermostat. In our experience the usage of instruments of this type is the logical and safe way to heat the marine aquarium. Salt water is an extremely good conductor of electricity. It also has an irritating habit of seeping into the most embarrassing places such as the electrical connections between conventional separate heaters and thermostats. Many unfortunates have lost expensive collections of beautiful animals as a result of electrical burn-outs at these junctions. A combined heater/thermostat uses no such connection but plugs straight into the mains point, (which should always be above water level), is easy to hide and is frequently cheaper than a separate heater and thermostat.

ii. Tank Sealant.

Messrs. Trophy Products of Bristol have produced a much-needed silicone rubber glass adhesive called "Trophix". This product is vital for the sealing of the interior seams of old fashioned putty-glazed aquariums for the following two reasons—(a) most putties and the oils which they contain are toxic to marine life and (b) most putties soon crumble and collapse under the corrosive influence of sea-water, quickly reducing the prettiest tank to a leaking shambles. Although we, personally, have not yet had the pleasure of testing this product, we have had many excellent reports of it and also of that Company's splendid free advice service for those persons wishing to construct their own all-glass tanks.

iii. Foods.

Miracle have added freeze-dried Fairy Shrimp to their range of foods but unfortunately this product is not taken by all marines quite so avidly as F/d Brine Shrimp. It is mentioned here because, as exceptions to the rule, many Butterfly fishes will accept F/d Fairy Shrimp greedily.

A British company has produced a broad-spectrum, high-concentrate, vitamin additive for coral fishes which lengthy research has shown to have considerable therapeutic and tonic value in its provision, in really assimilated and palatable form, vital elements missing from the foods currently fed to aquarium animals. The trade name of this product is Sea-Vita.

iv. Disease treatments.

A new product named Caprazin, a compound of four chemicals, has shown itself to be highly effective in the treatment of *Oodinium*, *Ickyophthirus* and *Cryptocaryon irritans* infections. Regrettably it is lethal to all Invertebrate life, except the Crustacea. There is a great need for a treatment which will be effective against these diseases in tanks containing communities of fishes and invertebrates, without destroying the latter.

v. Testing equipment.

The American Rila Company has produced good value for money kits, one for the determination of the pH of seawater

and one for the determination of nitrite levels. However, since both these kits are colourimetric, which involves highly subjective decisions at the best of times, they are not really accurate tools in the hands of the rank beginner who, unfortunately, is the one person who has the greatest need of them. An experienced marine aquarist can tell in most cases simply by looking at the water and the condition of the animals it contains, whether there is anything wrong. He will resent to the usage of such equipment as that described above for periodic checks and will usually make an accurate reading with it. The beginner, on the other hand, will frequently make a wrong interpretation of the undoubtedly difficult-to-determine colour change involved.

vi. Filtration.

The Nuova Power Filter, of German manufacture, has now firmly established itself as a powerful, silent and reliable alternative to the Eheim range of filters. Output for output, it is not significantly any cheaper than its major competitor and the Eheim is certainly easier to service. Also, an unfortunate design feature of the Nuova is that its cooling louvres are on the dorsal surface of the pump-motor casing, making it all too easy for the inexperienced to spill salt-water into the works—never a good thing for electric motors. On the other hand again, the Nuova is much more reliable in operation than the Eheim in our experience so I suppose what are gains on the roundabout is lost on the swings. We all eagerly await the long-rumoured (and long-overdue), British power filter.

The high-performance SeAquariums Under-Gravel Filtration System has proved, at least to the satisfaction of those thousands who have visited our Showroom in the last eight months, that the days when it was necessary to buy £200-month of foreign equipment to maintain £20-worth of fishes are over. Our spotlessly-clean, sparkling tanks, abounding with all manner of long-term residents (many of which were previously labelled "Impossible" by the pundits), have not been cleaned since they were set up some eight months ago, yet the only water-treatment practised is efficient undergravel filtration with one-day per-month charcoal filtration, coupled, of course, with good water management and intelligent animal husbandry for which there is no substitute at any price. Finally, a very recent new development in the filtration field, is a chemically inert micro-fine filtration additive, which when fed into a Nuova or Eheim Power Filter, converts it into a Microfiltration System capable of curing green-water and even taking pathogenic bacteria and protozoans from solution.

vii. Synthetic Sea Salts.

1969 saw the launching of the first all-British sea salt. Tested for almost three years prior to marketing, this very superior product outdoes its competitors on any important aspect, including purity, solubility, price, durability, and, most important, its life-supporting ability. Animals which were previously considered impossible to culture in small home-tanks, e.g., Nudibranchs, Corals, Octopus etc thrive, feed and even, in some cases, reproduce in this amazing preparation.

I was recently amused to see an advertisement by someone called "Kraken" announcing the impending arrival of a "Synthetic Natural Sea Salt". To return to our motoring analogy, one is reminded of the Japanese advertising copy-writers' boob (when, to be fair, may have suffered in translation) in talking about a "manual automatic gearbox".

viii. Prophylactic Apparatus.

When I coined this term, I intended it to mean disease-prevention equipment as opposed to disease-treatments. Using this definition, I am pleased to see Dr. Neville Carrington's Interpret Ultra-Violet Sterilizer back in the market at a very reasonable price, whilst Erwin Sander's Ozonisers continue to find a ready market amongst the "Clinicians", many of whom are remarkably successful in their fish-keeping. The Ozoniser now has a vastly-improved all-glass reaction-vessel which should rule out the occasional premature failures experienced with the perspex and-mica types.

ix. Aquariums.

This year also saw the launching of the first serious new concept in aquariums for a long time. More than a purpose-built marine aquarium and more than the most highly-efficient bio-chemical and mechanical filtration system yet designed, this aquarium is a combination of both these desirable features, and provides prophylactic control, protein-skimming and pH buffering as optional extras at little extra cost. The tank, and its built-in filtration system, are of plastics and glass construction only and are therefore the ultimate in non-toxicity. Apart from the hobby field, those involved in marine biological research have not been slow to avail themselves of the unique culture system opportunities which this invention offers.

The above, then, is a list of what I consider to be the more important developments affecting the marine hobby in 1969. I should state here that there may be many dozens of other excellent products at home and abroad of which I am not yet aware, and to the manufacturers of those products I must apologise for my ignorance at this stage.

Finally, I would like to make a few observations on existing Dealer-Hobbyist Relations, and how in some cases they may be improved in the future.

What the hobbyist wants from his Dealer.—This requirement can be summed up in one word—SERVICE. But this is not an over-simplification. I don't simply mean opening and closing doors and having to say 'Sir' to someone who may be rude and so patently objectionable that under different conditions one might use different appellations than "Sir".

Service means advice, even when this conflicts with one's business interest. I have lost count of the number of customers' who I have sent up the road to the pet shop for tropical fresh water fishes, because having spent in some cases 20-30 minutes discussing the marine aquarium, I secretly reached the conclusion that that person would be unlikely to make the grade as a marine aquarist. We tell our customers that they may 'phone us up at ANY time of night or day for free advice if they're not happy with any aspect of their system. Because of the inherently fool-proof nature of the "SeAquarium System", my sleep has only been disturbed once, but we're quite certain that our many owners of SeAquarium installation enjoy their sleep because of the sense of security this simple service offers them.

Service means knowledge and experience. I never cease to be impressed by the integrity of the many small dealers who come to me and say honestly and openly—"Look, I know nothing about marine tropicals, but my customers' keep asking for them, and I want to learn to keep them myself

before I offer them for sale". I can't help reflecting that if only some of the "get-rich-quick" types who got Marines such a bad name a few years ago had had this attitude, my first eight months in business wouldn't have consisted of an expensive public re-education programme. Of course you've got to have knowledge and experience to sell animals as expensive as many marines unfortunately are. No-one in their right mind would go to a bomb-site car dealer to buy a Rolls-Royce. Many traders have bitterly criticised the "SeAquarium System" booklet, saying that it lost them more custom than they gained by frightening certain potential customers away. But this is precisely what it was meant to do. They (the Traders) cannot realise that the Trade and therefore the Hobby, since the interests of the two parties are inseparable—is better off *without* the customer who would happily throw a *Chelmon rostratus* into a gold-fish bowl and feed it Joe Blogg's Patent Dried Food with a shovel twelve times a day whether it needed it or not.

Service means keeping an open mind and developing intellectual humility and honesty. I cringe when people refer to me as an "expert marine biologist" or "the authority on Tropical Marine Life". There "aint no such animal". I've been studying marine life, native and tropical, for more years than I care to remember. I've spent hours swimming on coral reefs observing and collecting specimens; hours on laboratory-work analysing statistical experimental data concerning different system designs, and yet I feel that I know so little about the sea in relation to what remains yet to be discovered that the rest of my life-time won't be a long enough period of time. I often think that I learn almost as much from some of our experienced customers as they learn from us, although they always politely hasten to tell me that this isn't so.

I was horrified to learn recently that one very well-known trader was no longer going to quarantine his marine stock prior to sale because he had signed a contract with a very good collector who quarantined all fishes prior to shipment. Well, of course, all good collectors do that anyway, but any trader importing his own fishes must clearly understand that the varying degrees of shock-state in newly-imported fishes, created by twelve hours plus in a polythene bag, causes latent oodinium infection to become overt in about 70% of imported marine fishes on arrival in the U.K.

Futhermore, any trader who sells a customer any marine fish and doesn't simultaneously sell him a proven oodinium disease remedy, WITH STRICT INSTRUCTIONS TO USE IT, AS PRESCRIBED, AUTOMATICALLY ON ARRIVAL HOME, is doing his customer a severe disservice in that he is almost certainly selling him a doomed fish. For the same reasons, as explained above, 7 out of 10 marines begin to develop overt oodinium disease in the polythene bag on the way to their new homes. The principal mistake of many dealers is that they wait until oodinium disease is so far advanced in their customer's fish that no treatment, only a miracle, could save *D. Oodinium ocellatum* dinoflagellates are principally gill-parasites, and thus the dermal cysts they create cannot be seen until they have spread onto the body. Unfortunately by the time the small body spots are visible, the fish's gills are almost destroyed. This is why we advise all our customers to treat all their fishes *AUTOMATICALLY* as though they had oodinium disease as soon as they get them home—they thus have everything to gain and nothing to lose.

I would like to pay tribute here to the small band of

Britons, whose determination, skill and perserverance, not to mention colossal financial outlay over several years, has made it possible for me to call 1969—"The Year of the Marine Tropical". I refer, of course to such dealers as Mr. Colin Roe of Shirley Aquatics, Birmingham and Mr. Max Gibbs of The Goldfish Bowl, Oxford, whose personal standards of knowledge, helpfulness and business integrity command such immediate respect. These were the men, who, in the early days, continued to import tropical marine animals, even though they often suffered terrible losses, so that a few British aquarists could be building up the not inconsiderable (but still far from complete), body of information which smooths the path for today's beginner. These were the men who built the Model "T", so that today you could enjoy your Maxi or Viva. These were the men who made specimens available to private collectors of the outstanding courage and will of Roger Aked of Knaresborough (Chinician), Eric Mole of Penge (Chinician), Michael Stinton of Amersham (Naturalist). I used the word "courage" in the preceding sentence not illadvisedly. Believe me, it needed something very akin to courage in the old days to lay out *yet another* £5 note for a marine tropical fish, whose brother had just that moment performed an expensive "dance of death" right in front of your eyes. Roger Aked, has, over the last few years, built up a private collection of tropical marine life which no private individual in Europe can equal and which few Public Aquariums can better. Eric Mole has done exactly the same thing, in smaller tanks, but his collection is no less impressive, whilst Michael Stinton's Natural System is a delight to behold. These are, of course, only three of the twenty or thirty such pioneers in Gt. Britain.

In closing, let me return to my opening analogy and say that I categorically deny that the most advanced motor-car in the world is the French DS19 or ID19. I can think of at least four British motor cars which outpoint Citroën hands down. Let us try to make sure that in the marine aquarium branch of the hobby, we don't see Citroëns (Mercedes and Alfas) through our windscreens, but through our rear-view mirror.

Good fishkeeping,
(Marine, of course).



Seaham (Rock House) and District Aquarist Society

The above society would like to know the names and addresses of all Federation Secretaries in Great Britain, as they are going to stage a Major Aquarist Show in the near future.

Will all interested club secretaries send their names and addresses to Mr. A. H. Coulson, 17 Tempest Road, Seaham, Co. Durham.

If this could be done it would be a great help to the society.

Solution to "Find the Fish"

see page 142

Answer, GIANT DANIO



News from AQUARISTS' SOCIETIES

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

AT the Annual General Meeting of the **Ilford & District Aquarist & Pondkeepers' Society**, reports were received from the Secretary, the Treasurer and the Assistant Show Secretary, stating that the Society had had a successful year both financially and on the show benches. The following members were elected to the principal offices for the coming year:—President: A. Seeborg, Vice Presidents: L. Jarvis, M. Ibrahim, Chairman: J. Sanders, Secretary: R. Ruth, Treasurer: M. Bell, Show Secretary: H. Berger, Press Secretary: N. Reade, Librarian: K. Ellis.

Results of the Table Show were:—**Breeder's Pairs**: 1, J. Foster (Dwarf Goldfish); 2, W. Rowe (American Flag Tetra); 3, W. Rowe (Rosy Barbs); 4, W. Rowe (Velifera Molliis); **Tropical Catfish**: 1, R. Ruth (Plecostomus); 2, W. Rowe (Pangasius); 3, Mrs. P. Reade (Mystus Temarai); 4, J. Foster (Melinistus); **A.V. Coldwater Fish**: 1, R. Ruth (Common Goldfish).

Visitors and new members are welcome to attend the meetings at 8 p.m., second Monday each month, at St. Laurence Hall, Hamilton Avenue, Barking, Essex. Further information can be obtained from The Secretary Mr. R. Ruth, 103 Heath Road, Chadwell Heath, Essex.

EARLY in July the **Gloucester A.S.** held its second meeting when the members were told that the Committee had been very fortunate to secure as the Patron of the Society, Mr. Peter Scott, C.B.E., D.S.C., L.L.D., the well known Naturalist, of the Wildlife Trust, Slimbridge, Glos.

After Club Business was discussed a Film Show was to have taken place but this had to be cancelled at the last minute as the Projectionist was delayed at the Investiture held at Caernarvon. Mr. Peter Treadgold of the **Bishops Cleeve A.S.** who was amongst the Guests filled the breach most admirably by giving a very informative talk 'off the cuff' on "Table Shows".

IN warm and sunny weather **Swillington A.S.** recently held their fourth Annual Open Table Show which proved to be a great success; the entries again increased by more than one hundred over the previous year making a total of 506. The results were as follows: **Guppies**: Mr. Thickboom (Section Winner); 2, and 3, Mr. Duffy; **Mollies**: 1, Mr. and Mrs. Hurrap; 2, Mr. Allsop; 3, W. Payer; **Platies**: 1, Mr. Douglas; 2, J. Whitley; 3, Mr. Derric; **Swordtails**: 1 and 2, Mr. Douglas; 3, Mr. Fledger, A.O.V. **Livebearer**: 1, G. Binka (Section Winner); 2 and 3, L. Kaye; **Characins (Small)**: 1, Mr. Walker; 2, R. Wilkinson; 3, Mr. and Mrs. F. Buckton; **Characins (Large)**: 1, P. Reynolds; 2, N. Turner; 3, G. Monk; **Barbs (Small)**: 1, Mr. and Mrs. F. Buckton; 2, Mrs. I. Bulleyment; 3, W. Payer; **Barbs (Large)**: 1, M. Woodley; 2, M. Allison; 3, D. and R. Standen; **Sharks and Fox**: 1, J. Blamires; 2, Mr. Walker; 3, D. and B. Standen; **Rasbora Danio and Minnows**: 1, Miss S. Gerrard; 2, R. Wilkinson; 3, Mr. Purvis; **Corydoras Cats**: 1, Mr. Walker; 2, P. Booth; 3, R. Strimmer, A.O.V. **Cats and Loach**: 1, Mr. and Mrs. Webb; 2, F. Gates; 3, P. Reynolds; **Toothcarps**: 1, D. Wragg; 2, Mrs. I. Bulleyment; 3, D. and R. Standen; **Fighters**: 1, M. Woodley; 2, Mr. Whoolock; 3, Mr. Asquith; **Anabantids**:

1, Mr. Wilberham; 2, Mr. Megson; 3, M. Woodley; **Dwarf Cichlids**: 1, D. Jackson; 2, S. Brook; 3, L. Kaye; **Large Cichlids**: 1, Mr. Kennedy; 2, Mr. and Mrs. Helm; 3, K. Binn, A.O.V. **Tropical**: 1, Mr. Kennedy; 2, M. Allison; 3, Mr. Derric; **Pairs Livebearers**: 1, Mr. Duffy; 2, W. Horton; 3, H. Gardner; **Pairs Egglayers**: 1, Mr. and Mrs. Helm; 2, D. and R. Standen; 3, Mr. and Mrs. Cohen; **Breeder's Livebearers**: 1, G. Monk; 2, Mr. Duffy; 3, H. Gardner; **Breeder's Egglayers**: 1, Mr. and Mrs. F. Buckton; 2, D. Wragg; 3, Mrs. S. Barry; **Coldwater**: 1, 2, and 3, Mr. Eaden; **Furnished Jars**: 1, Mr. Dunsomson; 2, Mr. Skirrow.

The Best Fish in Show award went to Mr. Kennedy of Bradford, who received the Aquarist Gold Pin and the Longlife Championship Medal. Alfreton A.S. won the Duraleife cup for the society gaining most points (18); Alfreton came second with 15, Sheffield came third with 14 and Dukeries fourth with 12.

The provisional date for Swillington's fifth Annual Open Table Show is 21st June 1970.

THE June meeting of the **Bishops Cleeve A.S.** was well attended. The guest speaker was J. Wheeler of Trowbridge who gave a talk on Show Conditioning and Judging Tropical Fish, followed by a discussion. The table show was for Anabantids. First was a Honey Gourami exhibited by N. Dooley, second and third places going to D. Stevens with an Opaline and Pearl Gourami respectively. Enquiries for meeting place and times are available from N. Binding, 26 Oxbores Caesvan, Station Road, Woodmancote, Cheltenham, Glos.

THE **Brighton & Southern A.S.** annual show was well supported and a total of close on 500 fish were entered including 118 very impressive Guppies, benched on the F.G.A. stand. The results of the various classes were as follows: **Furnished Aquaria**: 1, E. R. Nicoll, 76 pts.; 2, D. C. M. Durrant, 74 pts.; 3, C. W. Mole, 69 pts.; 4, A. K. Massey, 68 pts.; **Barbs**: 1, C. West; 2, W. D. Harper; 3 and 4, J. Cox; **Characins**: 1, P. C. Waring; 2, A. J. H. Smith; 3, P. Abbot; 4, E. Cox; **Cichlids**: 1, J. Bellingham; 2, Mrs. C. Scott; 3, H. Madison; 4, P. Tee; **Dwarf Cichlids**: 1, Mr. Grosvenor; 2, J. A. Pollard; 3, I. T. Marchant; 4, D. W. Ellis; **Swordtails**: 1, K. Dryden; 2, B. F. Mason; 3, C. Walford; 4, D. V. Larder; **Platies**: 1, P. R. Kendrick; 2 and 4, L. G. Little; 3, P. Abbot; **Mollies**: 1, A. M. Kinsey; 2, B. Mason; 3 and 4, K. Williams, A.O.S. **Livebearer**: 1 and 4, Miss M. Scott; 2, M. J. Ellick; 3, K. Dryden; **Breeder's Classes**: **Tropical Egglayer**: 1, Mr. Grosvenor; 2, D. C. M. Durrant; 3, J. Kall; 4, Q. J. Taylor; **Tropical Livebearer**: 1 and 2, L. G. Little; 3, K. Dryden; 4, H. S. Wood; **Labyrinth**: 1, D. Soper; 2, P. R. Kendrick; 3, Mrs. R. Greenhale; 4, L. Ainsworth; **Fighters**: 1 and 2, R. S. Winch; 3, C. Le Maitre; 4, D. C. M. Durrant; **Egg-laying Tooth Carp**: 1, D. W. Ellis; 2, Mrs. C. Scott; 3, D. C. M. Durrant; 4, R. Taylor; **Tropical Catfish**: 1, M. J. Wood; 2, T. J. Summers; 3, G. Lucas; 4, Mrs. P. Tee; **Corydoras and Botia**: 1, G. Greenhalf; 2 and 3, T. J. Summers; 4, N. A. Trulmin; **Rasbora**: 1, E. Cox; 2, J. A. Pollard; 3 and 4, W. D. Harper; **Danio and White Clouds**: 1, W. D. Harper; 2, D. W. Ellis; 3, J. Bellingham; 4, Mr. Grosvenor, A.O.S. **Tropical Egglayer**:

1, L. G. Little; 2, P. Tee; 3, D. Soper; 4, J. Smith; **Guppy Classes**: Best Single, J. Thorne; Best Opposite, T. J. Croucher; Best Breeders, D. Soper.

Coldwater Classes:—Common Goldfish and London Shubunkin: Common Goldfish, J. H. Kempley; Single Tail and Comets: 1, Single Tail, Mrs. M. Dudley; 2, Comet Tail Shubunkin, M. J. Black; **Twin-Tailed Goldfish**: 1, Twin-Tailed Goldfish, R. D. Smith; 2, Pearl Scale, Mrs. M. Dudley; A.O.S. **Coldwater Fish**: 1, Mrs. M. Dudley; 2, I. T. Mathieson; 3, R. D. Smith; 4, I. A. Kettle.

Trophies awarded were as follows:—The Brighton Trophy—Best in Show—Clarius—M. J. Wood; The F.B.A.S. Championship Plaque—Class 'C'—P. G. Waring; The Dea Bryan Trophy—Best Furnished Aquaria—E. R. Nicoll; The J. Pelham Cup—Best Barb—C. West; The T. J. Croucher Cup—Best Single Guppy—J. Thorne.

The June meeting was well attended by the members who came along to see an excellent series of 8mm. and 16mm. movie films shown by Mr. Mason Smith, F.Z.S. These beautifully made films covered just about everything from male Siamese Fighters battling for a mate, to the weird antics of an African Clawed Toad.

THERE was a record number of entries, 369, at the **Salisbury and District A.S.** annual open show. The winners were: **Rasbora Danio** Mr. Minnow; 1, D. Jones (Southampton); 2, R. Harvey (Amesbury); 3, T. Jones (Southampton); **Egg-laying Toothcarps**: 1 and 2, D. Ellis (London); 3, J. West (Salisbury); **Characin Hemigramus and Hyphessobrycon**: 1 and 3, G. Marks (Portsmouth); 2, D. Ellis (London); A.O.V. **Characin**: 1 and 3, M. Foyle (Salisbury); 2, A. Cox (Weymouth); **Platy**: 1, C. Cook (Salisbury); 2, J. West (Salisbury); **Squibs (Weymouth)**, **Guppy (Male)**: G. Orton (Weymouth); 2, J. Turner (Weymouth); T. Jones (Weymouth); **Guppy (Female)**: 1, J. Turner (Weymouth); 2, C. Beets (Portsmouth); 3, C. Cook (Salisbury); **Swordtails**: 1 and 3, G. Carter (Weymouth); 2, T. Dench (Salisbury); **Molly**: 1, T. Jones (Southampton); 2, T. Coombs (Salisbury); 3, M. Sainsbury (Amesbury); A.O.V. (**Livebearer**): 1, A. Blake (Basingstoke); T. Blanchard (Salisbury); 3, R. Brown (Salisbury); **Cichlid**: 1, T. Hutton (Weymouth); 2, K. Willey (Salisbury); 3, A. Cox (Weymouth); **Barb**: 1, A. Blake (Basingstoke); 2, A. Cox (Weymouth); 3, I. Goddard (Salisbury); **Corydoras Cats**: 1, T. Blanchard (Salisbury); 2, A. Blake (Basingstoke); 3, G. Carter (Weymouth); A.O.V. **Cat**: 1, D. Ellis (London); T. Jones (Southampton); 3, T. Blanchard (Salisbury); **Fighters**: M. Sainsbury (Amesbury); 2, Gregory (Bristol); 3, A. Blake (Basingstoke); A.O.V. **Lab.**: 1, D. Jones (Southampton); 2, G. Orton (Weymouth); 3, A. Blake (Basingstoke); **Breeder's Live**: 1, C. Beets (Portsmouth); 2, A. Blake (Basingstoke); 3, M. Sainsbury (Amesbury); **Breeder's Egglayers**: 1, R. Brown (Salisbury); 2, Russell (Southampton); 3, D. Jones (Southampton); A.O.V. (**Tropical**): 1, T. Hutton (Weymouth); 2, A. Blake (Basingstoke); 3, D. Hazenise (Salisbury); **Common Goldfish**: 1 and 2, Mr. Jefferies (Bournemouth); 3, C. Beets (Portsmouth); **Fancy Goldfish**: 1, 2 and 3, V. Collins (Yeovil); **Shubunkin**: 1, 2 and 3, Mr. Russell (Southampton); A.O.V. **Pond or River Fish**: 1, 2 and 3, V. Collins (Yeovil).

MARNES have gained a foothold at the **Baling and District A.S.**; two members have taken an active interest in this side of the hobby, and the rest of the club members are awaiting reports from the two intrepid pioneers.

During May, the Home Furnished Aquarium competition was held and judged. The winner being J. Healey, followed by May Buehler. The next two places went to R. Savage and Rob Sellers. J. Healey also took first and third places in the monthly Table Show, increasing his lead in the individual points total race.

At a recent meeting, various Study Groups were set up, and the newly formed Photography group lost no time in arranging a meeting. A

taped lecture on Fry Feeding, made by a member was played, as an example of what could be done by other groups using tape as a medium for their reports to the club. Table Show Results: Pairs: 1, R. Savage; 2, J. Irvine; 3, J. Healey; 4, R. Mills. Labyrinth: 1, J. Healey; 2, J. Bains; 3, G. Burgin; 4, R. Sellers.

The main item at the June meeting of the New Forest A.S. was an illustrated lecture by Mr. W. Ryder. The slides shown covered a wide range of subjects of interest from a Bog garden in an old bath to the construction and maintenance of indoor aquaria. The results of the table shows were as follows: Guppies: 1, 2 and 3, R. Mossley; 4, D. Tuckwell. Swordtails: 1, 3 and 4, D. Harding; 2, D. Tuckwell. Special: A. Williamson.

The Kingston and District A.S. open show attracted 723 entries, the details being as follows: Main trophy winners—Best in show: R. King. Committee Bowl: B. J. Pawley. Greenhalf Cup: A. Morgan. Illus. Trophy: J. D. Wilson. Norbion Bowl: P. Grosvenor. Hunt Cup: C. Stott. A.V. Swords: 1, J. Stephens; 2, B. E. Mason; 3, P. O'Brian; 4, M. Carter. A.V. Pairs: 1 and 4, L. G. Little; 2, W. D. Harper; 3, Mr. Strudwick. A.V. Molly: 1 and 4, J. D. Wilson; 2, B. E. Mason; 3, B. Funnell. A.O.V. Livebearers: 1, A. Blake; 2, R. Cooper; 3, M. Carter; 4, G. Greenhalf. A.V. Barb: 1, P. Grosvenor; 2, P. Ginger; 3 and 4, C. E. Pike. A.V. Characins: 1, J. Pollard; 2, R. Cooper; 3, C. Beets; 4, Mrs. L. J. Thorne. A.V. Dwarf Cichlids: 1, M. Clarke; 2, Master A. Withers; 3, H. S. Wood; 4, A. Blake. A.O.V. Cichlids: 1, B. Pawley; 2, I. J. Perman; 3, R. J. Thorne; 4, D. C. M. Durant. A.V. Danio etc.: 1, W. D. Harper; 2, B. Cox; 3 and 4, J. W. Goswer. A.V. Toothcarp: 1, C. Stott; 2, D. C. M. Durant; 3, R. Taylor; 4, H. Towell. A.V. Corydoras: 1 and 2, Mrs. M. Nicoll; 3, I. J. Perman; 4, E. Cox. A.O.V. Cat: 1, A. Morgan; 2, F. R. Kendrick; 3, J. Bellingham; 4, W. D. Harper. A.V. Loach and Botia: 1, M. Carter; 2, L. G. Little; 3, P. W. Arnold; 4, P. Ginger. A.V. Labyrinth: 1, J. D. Wilson; 2, F. R. Kendrick; 3, S. Mooney; 4, R. Reed. A.O.V. Tropical Eggs: 1, R. King; 2, L. Smith; 3, R. J. Thorne; 4, R. Kerridge. Breeders Egglayers: 1, J. D. Wilson; 2, C. Stott; 3, R. G. Cox; 4, P. Grosvenor. Breeders Livebearer: 1, R. Russell; 2, L. G. Little; 3, R. G. Cox; 4, R. Russell; 2 and 4, L. G. Little; 3, R. G. Thomas. Goldfish etc.: 1, C. Beets; 2 and 4, R. E. Dudley; 3, Mr. Strudwick. A.V. Singletails: 1 and 4, L. Jones; 2, R. E. Dudley; 3, Miss H. Savage. A.O.V. Fancy Goldfish: 1 and 3, Mrs. G. Longstaff; 2, Stokes Dug; 4, R. E. Dudley. A.V. Native and Foreign: 1 and 3, R. E. Dudley; 2, R. Russell; 4, V. Voysey. A.V. Tropical Pairs: 1, J. Pollard; 2, C. Walford; 3, D. Gollup; 4, P. Ginger. A.V. Plants: 1, 2, 3 and 4, G. Greenhalf.

The June meeting of the Amesbury and District A.S. was supported by 25 members. The Chairman, Mr. Sainsbury, started the evening with a short meeting, during which he informed members of proposals to arrange an "Aquarist Car Rally", an "Auction and Gadgets Evening" and a Public Draw in the near future. He also called for members who would be willing to take a place on the roster for the periodic visit to "Odstock Hospital" for tank maintenance purposes.

The "Bottle Show" had a good entry of 21 fish between the two classes—Barbs and Female Guppies. The judge, C. Letson, praised both the number and condition of the fish entered and gave the following results: Barbs: 1, Mr. Snell; 2, Mr. Barron; 3, Mr. Carnus; 4, Mr. Rose. Female Guppies: 1, Mr. Rose; 2, Mr. Lane; 3, Mr. Mewett; 4, Mr. Elliott.

Three teams, made up from members, entered for the evening's "Aquarist Quiz". The winning team was Mr. and Mrs. Rose, Mr. Lane and Mr. Snell.

The Alfreton and District A.S. held their annual open show recently, and the total number of entries of 372 was slightly higher than the

previous year. Results: Guppies: 1, 2 and 3, Mr. Duffy (Alfreton). Plants: 1, R. F. Senior (Sheffield); 2, M. Allsop (Alfreton); 3, I. G. Shipman (Derby). Mollies: 1, V. Powell (Grantham); 2, M. Harrington (Hucknall & Bulwell); 3, Mr. and Mrs. Burnap (Airlough). Swordtails: 1, N. R. Gibson (Huddersfield); 2, P. Reynolds (Dukeries); 3, N. F. Warburton (Derby Regent). Small Barbs: 1, Miss S. Gerrard (Alfreton); 2, Mrs. Bullyment (Nottingham); 3, J. Wright (Alfreton). Large Barbs: 1 and 2, R. P. Senior (Sheffield); 3, M. Woodley (Sheffield). Small Characins: 1, D. Wragg (Alfreton); 2, J. Wright (Alfreton); 3, R. W. Walker (Alfreton). Large Characins: 1, D. M. L. (Chapelstown); 2, R. T. Bull (Derby R.); 3, E. Smith (Hucknall & Bulwell). Killifish: 1, D. Wragg (Alfreton); 2, S. Dooly (Alfreton); 3, Mrs. Bullyment (Nottingham). Minnows and Danios: 1, Goodwin Bros. (North Staffs.); 2, J. Wright (Alfreton); 3, B. Hickling (Alfreton). Sharks and Foxes: 1, R. Walker (Sheffield); 2, J. Derric (Dukeries); 3, K. Owen (Hucknall & Bulwell). Raboras: 1, S. Hill (Alfreton); 2, A. Webster (Rainworth); 3, D. Wragg (Alfreton). Dwarf Cichlids: 1, J. Derric (Dukeries); 2, W. Brainsford (Sheffield); 3, A. J. Garratt (Hucknall & Bulwell). Large Cichlids: 1 and 2, K. Bains (Sheffield); 3, J. Wright (Alfreton). Angels: 1, E. Mackintosh (Rainworth); 2, T. Power (Hucknall & Bulwell); 3, M. White (Rainworth). Catfish: 1, D. Sewell (Rainworth); 2, C. Cooper (Derby Sh. Gp.); 3, D. M. L. (Chapelstown). Loaches: 1, R. Walker (Sheffield); 2, Mr. and Mrs. Burnap (Aireborough); 3, Mrs. Bullyment (Nottingham). Siamese Fighters: 1, J. Amott (Alfreton); 2, R. F. Senior (Sheffield); 3, Master I. Eyre (Workop). A.O.V. Anabantids: 1, M. Woodley (Dukeries); 2, R. Walker (Sheffield); 3, J. Bramley (Alfreton). A.O.V. Tropical: 1, E. Jackson (Dukeries); 2, C. Cooper (Derby Sh. Gp.); 3, P. Reynolds (Dukeries). Pairs, Egglayers: 1, D. Wragg (Alfreton); 2, P. Reynolds (Dukeries); 3, S. Paver (Grantham). Pairs, Livebearers: 1 and 2, P. J. Duffy (Alfreton); 3, D. H. Lemons (Alfreton). Juniors, Livebearers: 1, Master Gary Senior (Sheffield); 2, Scott Allwood (Hucknall & Bulwell); 3, Denise Parnell (Workop). Juniors, Egglayers: 1, Andrew Bull (Derby R.); 2, Master A. Jackson (Dukeries); 3, Miss C. Severn. Goldfish and Comets: 1, E. W. Eadon (Sheffield); 2 and 3, C. Hill (Nottingham). Shubunkins and Fancy Goldfish: 1, C. Hill (Nottingham); 2, E. W. Eadon (Sheffield); 3, C. Hill (Nottingham). A.O.V. Goldwater: 1, E. W. Eadon (Sheffield); 2, E. W. Eadon (Sheffield); 3, J. Amott (Alfreton). Breeders, Egglayers: 1, D. Wragg (Alfreton); 2, R. Walker (Sheffield); 3, W. Brainsford (Sheffield). Breeders, Livebearers: 1 and 2, P. J. Duffy (Alfreton); 3, N. Fearn (Stokebridge). Novice: 1, D. Moody (Boston); 2, M. Skivinton (Sheffield); 3, K. and M. Wall (Sheffield). Special awards were: Best fish in Show: a Rivulus Holmet owned by D. Wragg (Alfreton). A. Dooly trophy: P. J. Duffy. D. Wragg shield: R. F. Senior (Sheffield). J. Lindley shield: D. Wragg (Alfreton). Wright shield: D. Wragg (Alfreton). Cox shield: J. Derric (Dukeries). Gerrard shield: D. Wragg (Alfreton). M. Lindley shield: D. Wragg (Alfreton).

ANOTHER successful show was held by the Catford A.S. The results were as follows: Individual Furnished Aquaria: 1, S. Mooney (Tottenham); 2, E. Bloss (North Kent); 3, J. Stewart (London Transport). Barbs: 1, W. D. Harper (Kingston); 2, J. Parker (North Kent); 3, M. Jones (Erith). Characins: 1, J. W. Goswer (Bethnal Green); 2, F. R. Kendrick (Freeton); 3, T. W. Arnold (Bethnal Green). Cichlids: 1, A. Jamieson (Catford); 2, J. Parker (North Kent); 3, C. Hunter (North Kent). Angels: 1, P. Todd (East Dulwich); 2 and 3, L. Pickering (Sydenham and Pease). Dwarf Cichlid: 1, J. A. Pollard (Kingston); 2, A. Jamieson (Catford); 3, B. Bloss (North Kent). Labyrinth: 1, F. R. Kendrick (Freeton); 2, F. E. T. Smith (Catford); 3, A. Jamieson (Catford).

Egg-laying Toothcarp: 1, J. Bolton (Erith); 2, K. Owen (Catford); 3, Mr. Snelling (H.K.A.). A.S. Tropical Catfish: 1, G. Greenhalf (Kingston); 2, W. D. Harper (Kingston); 3, G. B. Martin (Bethnal Green). Corydoras: 1, G. Greenhalf (Kingston); 2, S. Mooney (Tottenham); 3, E. Bloss (North Kent). Raboras, Danios and W.C.M.M.: 1 and 2, J. W. Goswer (Bethnal Green); 3, W. D. Harper (Kingston). A.O.S. Tropical Fish: 1, L. Smith (Bethnal Green); 2, G. B. Martin (Bethnal Green); 3, T. W. Arnold (Bethnal Green). Tropical, Sexed (Pairs): 1, Mrs. J. Wilson (Catford); 2, J. D. Wilson (Catford); 3, A. J. McCarthy (Catford). O.S. Guppy: 1 and 3, L. Goff (Bethnal Green); 2, L. Smith (Bethnal Green). Swordtails: 1, F. E. T. Smith (Catford); 2, Mr. Tock (Independent); 3, J. Colben (Catford). Pairs: 1, F. R. Kendrick (Freeton); 2, W. D. Harper (Kingston); 3, J. Parker (North Kent). Molly: 1, J. D. Wilson (Catford); 2, B. E. Mason (Independent); 3, J. Colben (Catford). Singletailed Goldfish: 1 and 3, L. Jones (Catford); 2, A. C. Pawke. Twintailed Goldfish: 1, A. D. Simmons; 2 and 3, W. Iles (Catford). A.O.S. Coldwater: 1, L. Jones (Catford); 2, A. C. Pawke; 3, L. Jones (Catford). Breeders (Egglayers): 1, A. J. McCarthy (Catford); 2, J. D. Wilson (Catford); 3, J. Colben (Catford). Breeders (Livebearers): 1, P. Love (Catford); 2, G. Greenhalf (Kingston); 3, H. S. Wood (Croydon). Best Furnished Aquaria, (Lee Aquarium Cup), S. Mooney. Best Coldwater (Olive Cup), A. D. Simmons. Best Killifish (Iris trophy), J. Bolton. Best Sexed Pairs (Welling Trophy), Mrs. J. Wilson. Best Breeders (A. J. Shield), A. J. McCarthy. Best Mollies (F.B.A.S. Trophy), J. D. Wilson. Highest Pointed Gub (Jamieson Shield), Catford A.S. Best Fish in show was exhibited by F. R. Kendrick with a Combtal he won The Golden Rose Bowl and The Aquarist Gold Pin. P. Todd with his Angel is being recommended by the F.B.A.S. Judges for a Diploma of Merit.

THE results of the Derby Regent A.S. were as follows: Guppies: 1, Mr. Warburton (D.R.A.S.); 2, Mr. Shakespeare (Bedworth); 3, Mr. Warburton (D.R.A.S.). Livebearers: 1, D. T. Delves; 2, Mr. and Mrs. Ball (Aderstone); 3, P. Ledger (Top Ten). Danios, W.C.M.M. and Raboras: 1, S. Hill (Alfreton); 2, Mrs. Delves; 3, F. Wright (Alfreton). Barbs (up to 3 in.): 1 and 2, J. Wright (Alfreton); 3, S. Hill (Alfreton). A.O.V. Barbs: 1 and 2, Mr. Haynes (D.R.A.S.); 3, S. Hill (Alfreton). Dwarf Cichlids: 1, Mr. Hiron; 2, Mr. Todd; 3, K. Bains (Notts.). Angels: 1, Mr. Kendrick (D.R.A.S.); 2, Mr. Nightingale (Birmingham). Characins (up to 3 in.): 1, Mrs. Delves; 2, R. T. Bull (D.R.A.S.); 3, Mr. Newman. A.O.V. Characins: 1, Mr. and Mrs. Pearson (Rugby); 2, S. Hill (Alfreton); 3, T. Jerram (D.R.A.S.). Fishers: 1 and 3, J. D. Fellows (M.A.P.S.); 2, L. Kaye (Top Ten). A.O.V. Anabantids: 1, Mrs. Davies; 2, Mr. Warburton (D.R.A.S.); 3, W. Selby (Notts.). Catfish and Loaches: 1, Mr. Shakespeare (Bedworth); 2, Mr. Hunt (Barnes); 3, Mr. Showny (Coventry). Sharks and Flying Foxes: 1, Mr. Moss (D.R.A.S.); 2, Master Deakin (D.R.A.S.); 3, J. D. Fellows (M.A.P.S.). Livebearers Pairs: 1, Mr. Nightingale (Birmingham); 2, Mr. and Mrs. Simpson (Bedworth); 3, Mr. and Mrs. Pearson (Rugby). Egg-layers Pairs: 1, Mr. Showny (Coventry); 2, A. Smith (Stone); 3, J. Wright (Alfreton). Breeders Livebearers: 1, D. T. Delves; 2, Mr. Scally (Bedworth); 3, Mr. Hubert (D.R.A.S.). Breeders Egg-layers: 1, 2 and 3, J. Wright (Alfreton). A.O.V. Tropicals: 1, Mr. Cooper

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BE SURE** 
Hillside Aquatics London N12

(Derby); 2, W. A. Selby (Notts); 3, Mr. Whitmee (Rugby). A.V. Coldwater: 1 and 3, Mr. C. Hill (Notts); 2, Mrs. B. Wright (Alfreton). Killie Fish: 1, Mr. Hudson (D.R.A.S.); 2, Mr. and Mrs. Simpson (Bedworth); 3, M. W. Plant (Stone). Decorative Aquaria: 1, Mr. Kendrick (D.R.A.S.); 2, Mr. Holmes (D.R.A.S.). Juniors Livebearers: 1, T. Warburton (D.R.A.S.); 2, R. Shakespear (Bedworth); 3, J. Kendrick (D.R.A.S.). Juniors Egglayers: 1, R. Shakespear (Bedworth); 2, R. Holmes (D.R.A.S.); 3, Master Proctor (Top Ten). The trophy for the Best in the Show was won by Mr. Haynes (D.R.A.S.).

A CANADIAN aquarist was the guest at the **Horsforth A.S.** June meeting. He showed some slides of their fish, which were very much the same as in this country. The showing lasted an hour and the members were very interested. Table Show Results: Special Class: 1, M. Parker; 2, S. Greaves; 3, J. Girdham. A.O.V. 1, J. Girdham; 2, C. Coers; 3, Mrs. J. Dickinson. Junior A.O.V.: 1, Master J. Dugdale; 2, Master J. Dugdale; 3, Miss D. Holmes. Best in Show: J. Girdham.

THE Uxbridge & District A.S. held its annual open show in May and four hundred fish made up the twenty-three classes. While the judging was in progress exhibitors were entertained to an interesting lecture by Mrs. Monica Green, Secretary of The British Herpetological Society.

Principal prize winners were: Individual Furnished Aquaria: R. Forder (Uxbridge). Club Furnished Aquaria: Tottenham and District A.S. A.V. Tropical Plant: G. Greenhalf (Kingston). A.V. Goldfish: Mr. Vasey (Salisbury). A.O.V. Coldwater Fish: H. Thompson (Uxbridge). Guppy: M. Bradford (Hampton). Molly: B. E. Mason (Independent). Platy: L. G. Little (Bracknell). Swords: J. Stebbins (N. Kent). Characins: R. Smith (Tottenham). Labyrinth: F. Kendrick (Frelance). A.V. Corydoras: R. Cox (High Wycombe). A.O.V. Catfish: B. E. Mason (Independent). Cichlids: B. J. Powley (Kingston). Dwarf Cichlids: P. Grosvenor (Runnymede). Danios Rasbora: W.C.M.M.: P. Grosvenor (Runnymede). Barbs: P. Grosvenor (Runnymede). Egg-laying Tooth Carps: S. G. Tarrant (Hendon). A.O.V. Tropical Livebearer: J. Lamb (Basingstoke). A.O.V. Tropical Egg-layer: L. G. Little (Bracknell). Breeders (Egg-layer): P. A. Grosvenor (Runnymede). Breeders (Livebearer): L. G. Little (Bracknell). Special Class—Two pairs of A.V. Tropical fish: Mr. Beavis (High Wycombe).

P. Grosvenor took best in show with his Schuberti Barb, winning the rose bowl and the Pete Ginger Cup awarded annually for best barb. The Commemorative trophy went to Mr. Beavis for his win in the special class. The Ken Parry cup was won by B. E. Mason for best fish over nine inches long the *Loricora Parva*. Uxbridge A.S. won the trophy for highest points, 14; Runnymede being runners up with 12 points, a fine single handed effort by P. Grosvenor.

A MESSAGE from the Association of Yorkshire A.S. states "It is with profound sorrow that we hear of the tragic sudden death of Mrs. H. Dornie of Worsop. The Association wishes to extend their deepest sympathies to Mr. Dornie and to the Dukeries A.S. Her loss will be felt throughout the Association both as an aquarist and as a friend. K. J. Bateman, President Association of Yorkshire Aquarist Societies."

MEMBERS of Tombridge and District A.S. were given a talk recently on judging by C. A. T. Brown, "A" Class F.B.A.S. judge. In the course of his talk Mr. Brown pointed out many pitfalls to be avoided and gave some very useful tips to would-be exhibitors. Mr. Brown also judged the table shows with the following results—Corydoras: 1, I. T. Mathieson; 2, R. Taylor; 3, I. Bellingham. Killifish: 1 and 2, R. Taylor; 3, I. T. Mathieson.

AT the June monthly meeting of the **Castleford and District A.S.** the table show results were

as follow: Breeders (livebearers): 1 and 3, G. Thickbroom; 2, Mr. and Mrs. F. Gates. There were no entries in the Breeders Egg-laying class. A short but pleasing lecture was given by A. Town on Fancy Goldfish.

THE first annual general meeting of **Wales and West Federation of A.S.** was recently held in Bristol. Officers re-elected were—F. Brown, Chairman; L. Nighingale, Treasurer; F. Barry, Secretary, 18, Foscoote Rd., Ashton, Bristol, BS3 2BZ.

During the inaugural year the society met six times. Many items were discussed and decided upon to the mutual benefit of clubs in the area. One of these times was the formation of a new set of Inter-Club show rules. A panel of speakers and judges was formed whose services have been in great demand. It has been decided that the Society shall not be entirely Bristol based. This will be beneficial to clubs in South Wales and the South Coast area, enabling them to have a greater interest in the Society without having to travel possibly a distance of 200 miles.

The first of these Regional meetings will be held at—Palk Arms, Teignmouth Road, Torquay, on Sunday 10th August commencing at 2 p.m. Any club wishing to know more details of the Society please contact F. Barry, Secretary.

THE results of the **Boreham Wood and District A.S.** for the two table shows held in the club in the month of June were as follows: Swordtails: 1 and 2, R. Woolveridge; 3, P. Abbott; 4, J. Burrows. A.O.V. (egg-layers): 1 and 2, D. Roach; 3, J. Burrows; 4, N. Toulmin. Labyrinths: 1 and 3, R. Woolveridge; 2, N. Toulmin; 4, R. Rumsey. Fighters: 1, 3 and 4, P. Abbott; 2, R. Woolveridge. Platy: 1, 3 and 4, P. Abbott; 2, R. Woolveridge. Corydoras: 1, 3 and 4, D. Roach; 2, N. Toulmin. A.O.V. Cats: 1, D. Roach. Loaches and Botias: 1, P. Moriarty; 2 and 3, R. Woolveridge; 4, D. Hounsell. Best Fish in Show: P. Moriarty Botia Horae, 88 pts. The result of the six monthly club trophy was as follows: 1, R. Woolveridge, 42 pts.; 2, P. Abbott, 32 pts. 3, D. Roach, 25 pts.

AT the June meeting of the **Taunton and District A.S.** a very interesting talk on "Pond Life" was given by E. Eggleston, with numerous living specimens on view. Emphasis was given to the species most likely to give trouble to the aquarist. A new scheme, by which members can submit written questions for discussion after the talk, proved very successful.

The table show results were as follows: Cichlids: 1, N. Larcombe. Novice: J. Leam Angels: 1, 2 and 3, W. Corrick. Novice: 1, Master R. Knowles; 2 and 3, E. Ermslow. Dwarf Cichlids: 1, J. Leam.

The first annual open show was held in May and there were 29 classes. Awards were as follows—Angels: 1 and 4, W. Corrick; 2, A. Nicholls (Yeovil); 3, A. G. Cox (Weymouth). A.O.V. Tropical Freshwater Fish: 1 and 3, A. Cavill; 2, J. Turner (Weymouth). Barbs (3 in. and under): 1, A. Cavill; 2, Mrs. King (Bristol); 3, T. Hatton (Weymouth); 4, W. Corrick. Barbs (over 3 in.): 1, A. Cavill; 2, N. Larcombe; 3, J. Turner (Weymouth); 4, Mr. and Mrs. A. Cavill. Breeders (egg-layers): 1, Mrs. King (Bristol); 2, D. Rumsey; 3, G. P. Carter. Breeders (Livebearers): 1, W. Corrick; 2 and 4, M. Binding (Cheltenham); 3, J. Turner (Weymouth). Characins, H. and H.: 1, B. Hancock; 2, Mrs. King (Bristol); 3, C. T. Orton (Portland); 4, Mr. and Mrs. A. Cavill. Characins A.O.V.: 1, T. Hatton (Weymouth). Cichlids: 1, T. Hatton (Weymouth); 2, Mr. and Mrs. A. Cavill. Dwarf Cichlids: 1, T. Hatton (Weymouth); 2, G. P. Carter; 3, G. Milton; 4, J. Leam. Corydoras: 1 and 4, G. P. Carter; 2, A. Cavill; 3, Mrs. King (Bristol). A.O.V. Catfish: 1, Mr. and Mrs. A. Cavill; 2, R. Hancock; 3, J. Leam. Danios: 1, 3 and 4, W. Corrick; 2, A. E. Rendell (Yeovil). Rasboras and Minnows: 1, I. D. L. Fleetwood; 2 and 4, R. Cummings; 3, W. Corrick. A.V. Male Guppy: 1, Mr. and Mrs. A. Cavill; 2, G. Butt; 3, M. R. Gaylard (Yeovil); 4, M. C. Smith. A.V. Female Guppy: 1, C. T. Orton

(Portland); 2, Mrs. King (Bristol); 3, J. Turner (Weymouth). Siamese Fighters: 1 and 3, Mrs. King (Bristol); 2, M. J. Hulbert (Yeovil); 4, Mrs. R. Gregory (Bristol). A.O.V. Labyrinth: 1 and 3, G. Butt; 2, B. Hancock; 4, Mrs. A. Nicholls (Yeovil). Mollies: 1, M. R. Gaylard (Yeovil); 2, G. Butt; 3, A. Nicholls (Yeovil); 4, G. Milton. A.V. Platy: 1, W. Beavis; 2, A. E. Rendell (Yeovil); 3 and 4, W. Corrick. Swordtails: 1, 3 and 4, W. Corrick; 2, Mrs. R. Gregory (Bristol). Loaches, Botias and Sharks: 1 and 2, Mrs. King (Bristol); 3, G. P. Carter; 4, G. Milton. Egg-laying Toothcarps: 1, N. Larcombe; 2, 3 and 4, D. Rumsey. Pairs (livebearers): 1, G. Milton. Pairs (Guppies): 1, G. Butt; 2, G. Milton; 3, J. Turner (Weymouth). Pairs (Egg-layers): 1, D. Rumsey; 2, Mrs. King (Bristol); 3, M. J. Hulbert (Yeovil); 4, W. Corrick. Shubunkins: 1, 2 and 3, D. S. Langdon (Yeovil); 4, R. J. King (Newton Abbot). Goldfish varieties: 1, 3 and 4, R. J. King (Newton Abbot); 2, V. Collins (Yeovil). A.O.V. Coldwater: 1, C. Holmer; 2, R. J. King (Newton Abbot); 3, V. Collins (Yeovil). Best fish in show: *Barbus semifasciatus*, A. Cavill.

AT the annual general meeting of the **Goldfish Society of Great Britain** the retiring Officers were re-elected, and the committee now stands as follows: Capt. R. C. Betts, M.B.E., President; Major G. H. O'Neill, Chairman; W. L. Wilson, Secretary; G. A. Fleming, Assistant Secretary; W. F. Walters, Treasurer; Mrs. P. Whittington, Show Secretary; J. Linale, Public Relations Officer; R. Whittington, Bulletin Editor; J. H. Bundell, Technical Co-ordinator; A. R. Sutton, Lay Member; E. Palfrey, Lay Member; Mrs. W. Wilson, Lay Member. The Vice Presidents are: M. D. Cuss, O. D. Taylor, B. J. Upchurch. Details regarding the objects of the Society and membership may be obtained from the Hon. Secretary at 57 Constable Gardens, Edgware, Middlesex.

THE results of **Bradford and District A.S.** open show: Livebearers: Guppies: 1, Mr. and Mrs. Wells (Sunnybrow); 2, A. Manser (Beadford); 3, G. Thickbroom (Castleford). Swordtails: 1, T. Douglas (Hull); 2, P. Reynolds (Swillington); 3, F. Ledger (Top Ten). Mollies: 1 and 2, T. Collinswood (Hull); 3, Mr. and Mrs. Burnapp (Aireborough). Platies: 1, W. Fletcher (Bradford); 2, T. Douglas (Hull); 3, H. Gardner (Aireborough). A.O.V. Livebearers: 1, D. Kennedy (Bradford); 2, H. Gardner (Aireborough); 3, A. B. White (Keighley). Section Winner: T. Douglas (Hull). Barbs up to and including Rosy: 1, Mrs. S. Batty (Swillington); 2, J. A. Whiteley (Aireborough); 3, Miss B. Kaye (Huddersfield). Barbs over Rosy: 1, Mr. and Mrs. Howard (Barnsley); 2, Mr. and Mrs. Brown (Mixenden); 3, J. A. Whiteley (Aireborough). Section Winner: Mr. and Mrs. Howard (Barnsley). Characins up to and including Bleeding Heart: 1, Mr. and Mrs. Firth (Bradford); 2, R. Johnson (Independent); 3, D. Kennedy (Bradford). Characins over Bleeding Heart: 1, J. A. Whiteley (Aireborough); 2, N. Turner (Mixenden); 3, G. Monk (Aireborough). Section Winner: Mr. and Mrs. Firth (Bradford). Carps and Minnows: 1, A. B. White (Keighley); 2, G. Monk (Aireborough); 3, C. Asquith (Castleford). Sharks and Flying Foxes: 1, A. B. White (Keighley); 2, J. Scarf (Selby); 3, W. Batey (Bradford). Toothcarps: 1, K. Dixon (Mixenden); 2, W. Batey (Bradford); 3, Mr. and Mrs. Brown (Mixenden). Section Winner: A. B. White (Keighley). Fighters: 1, N. Spencer (Halifax); 2, D. Kennedy (Bradford); 3, C. Asquith (Castleford). A.O.V. Anabantids: 1, Mr. and Mrs. Firth (Bradford); 2, P. Booth (Wakefield); 3, A. Stretton (Aireborough). Section Winner: Mr. and Mrs. Firth (Bradford). Dwarf Cichlids up to and including Kribensis: 1, J. A. Whiteley (Aireborough); 2, J. Brook (Wakefield); 3, P. Booth (Wakefield). Cichlids (over Kribensis): 1, D. Kennedy (Bradford); 2, A. B. White (Keighley); 3, I. M. Todd (Independent). Angel Fish: 1, B. Tate (Aireborough); 2, D. Kennedy (Bradford); 3, L. Taylor (Privateers). Section Winner: D. Kennedy (Bradford). Catfish, Corydoras Species: 1,

A. G. Esteves (Top Ten); 2 and 3, P. Reynolds (Swillington); Loaches and Bettas: 1, D. Kennedy (Bradford); 2, G. Holdsworth (Privasiers); 3, M. Ward (Mizen), A.O.V. Catfish: 1, T. & W. (Sunnybrow); 2, D. Fryer (Halifax); 3, Mr. and Mrs. Bone (Huddersfield). Section Winner: T. and W. (Sunnybrow). Tropical: 1, D. Kennedy (Bradford); 2, P. D. Robinson (Bradford); 3, M. Middleton (Sunnybrow). Breeders (Livebearers): 1 and 2, H. Gardner (Aireborough); 3, G. Monk (Aireborough). Section Winner: H. Gardner (Aireborough). Breeders (Egglayers): 1, Mr. and Mrs. Firth (Bradford); 2, K. Dixon (Mizen); 3, Mrs. S. Barry (Swillington). Section Winner: Mr. and Mrs. Firth (Bradford). Pairs (Livebearers): 1, Mr. and Mrs. Bone (Huddersfield); 2, H. Gardner (Aireborough); 3, G. Thickbroom (Castleford). Pairs (Egglayers): 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, P. Reynolds (Swillington); 3, L. M. Todd (Independent). Section Winner: Mr. and Mrs. Grimshaw (Sunnybrow). Fancy Goldfish: 1 and 2, Mr. Eadon (Sheffield); 3, P. Moorhouse (Bradford). Common Goldfish: 1 and 3, Mr. Eadon (Sheffield); 2, Mr. Kaye (Huddersfield). A.O.V. (Goldwater): 1 and 2, Mr. Hooper (Bradford); 3, Mr. Eadon (Sheffield). Section Winner: Mr. Eadon (Sheffield). Best Fish in Show: D. Kennedy (Bradford).

TO celebrate their 21st year the Goldfish Society of Great Britain held a dinner and dance at the Windsor Rooms, Vauxhall Bridge Road, London, in May. The guest of Honour was Mr. Jessop, Chairman of the F.B.A.S., who remarked on the very close and friendly liaison existing between the two Societies. Many notable members were among the seventy-three members and guests, who travelled from afar (even from America) for this most enjoyable evening.

TWENTY members attended the June meeting of the Barnsley T.F.S. J. Brown from Mizen visited the Society and organised a quiz which proved very enjoyable. He also presented the plaque for furnished aquaria and medallions for the table show. The plaque was won by J. Howard. The table show was for Catfish and Loach and this was won by Mrs. B. Deaves, J. Howard being second with Mr. Claypole third. There was also a film slide on Killifish shown by Mr. F. Buxton. At this meeting it was decided to hold a fortnightly meeting in future.

RECENTLY the British Aquarist Study Society held its Second Spring meeting which was held at the Haslemere Museum in Surrey. Mr. H. L. Jones (Ass. Curator) gave an excellent informal talk and demonstration on "Water Life Under the Micro-projector". The Society was given the run of the Laboratory and all the microscopes. Samples of aquatic life were taken from the ponds in the Museum Grounds, and many varied forms studied. The Museum's excellent new Micro-projector was shown to its full advantage, and the keen interest in this aspect of fishkeeping ensured a most lively meeting.

DUE to increase in membership, the Hampstead and District A.S. has moved to a new venue at Bacon Residents Hall, Lismore Circus, London, N.W.5. At recent table shows benching has been exceptional with many members taking awards and a very interesting series of lectures on genetics, given by R. Eason, Iqg. F.R.A.S., has been very well attended. Mr. Katriusz, President of the F.B.A.S., has agreed to Honorary Membership of the Hampstead and District A.S.

THE Fourth International Guppy Show organised by the Fancy Guppy Association of Great Britain was held in June, when over four hundred Guppies were on display, entries being received from England, Scotland, Wales, Sweden, Austria and Germany. All First award winners received Top Class Trophies and Second and Third winners received Silver and Bronze Medals respectively. Best in Show, Best Opposite Sex, Best Breeders and Master

Breeder winners were given an additional prize, in the form of Aquarama Living Lamps. The Birmingham section of the F.G.A. received the Calgary Aquarium Society Trophy which was brought over from Canada by Mr. Graham Wood (who presented the Trophies and prizes) and was one of the finest and most impressive Trophies ever to be presented to the F.G.A. This is a section award Trophy and will be presented annually to that section which acquires the most overall points in the Show. The Show results were as follows: Deltatails: 1 and 3, P. J. Duffy; 2, R. Cheshire. Fantails: 1, H. Brachet; 2, M. Delingpole; 3, C. W. Parker. Original Veiltails: 1, M. Delingpole; 2, M. Kahrer; 3, D. Curry. Short Dorsal Veils: 1, R. Cheshire; 2 and 3, J. Wynn. Long Dorsal Veils: 1, C. W. Davies; 2, P. J. Duffy; 3, M. Delingpole. Scartails: 1, Mrs. J. Croft; 2, P. Scott; 3, N. and D. Court. Cofertails: 1, P. Jinks; 2, K. Rugby; 3, C. W. Davies. D. Fairhurst. Lyretails: 1, G. Fletcher; 2, Dr. W. Tritts; 3, P. Jinks. Top Swordtails: 1, P. Walker; 2 and 3, A. Charlton. Bottom Swordtails: 1, T. Hallett; 2, G. Fletcher; 3, N. and D. Court. Double Swordtails: 1 and 2, M. Delingpole; 3, W. Goldschmidt. Roundtail Males: 1, D. Becham; 2, M. Delingpole; 3, Dr. W. Tritts. Speartails: 1, P. J. Duffy; 2 and 3, M. Delingpole. Pintails: 1, J. Croft; 2 and 3, M. Delingpole. Colour Males: 1 and 2, D. Becham; 3, M. Delingpole. Superbs: 1, L. Smith; 2 and 3, M. Delingpole. Wedgetails: 1, A. Swain; 2, P. J. Duffy; 3, D. Becham. Metropolitan: 1, A. Charlton; 2 and 3, M. Delingpole. Roundtail Females: 1, Fowles & Vinal; 2, E. Royal; 3, R. Young. Scalloped Females: 1, Fowles & Vinal; 2, M. Delingpole; 3, G. Goodall. Colour Females: 1, B. Preston; R. Holt; 3, Fowles & Vinal. Experimental Males: 1, W. J. Geron. Experimental Females: 1, K. Rugby; 2 and 3, Fowles & Vinal. Breeders Males: 1, P. J. Duffy; 2, M. Delingpole; 3, C. W. Parker. Breeders Females: 1, M. Delingpole; 2, R. Holt; 3, N. and D. Court. Breeders Pairs: 1, T. Hallett; 2, D. Curry; 3, C. W. Parker. E. Royal. Master Breeders: 1, D. Curry; 2, Mrs. J. Croft; 3, A. Fish. Juniors, any standard variety: 1, Master P. J. Duffy; 2 and 3, Miss L. Hindley. Juniors, Breeders: 1, Master B. Parker; 2, Master P. J. Duffy. Ladies, any standard variety: 1, Mrs. E. Duffy; 2, Mrs. M. Cobb; 3, Mrs. G. Parker. Best in Show: Metropolitan Female, A. Charlton. Best Opposite Sex: Bottom Swordtail, T. Hallett. Best Breeder: Breeders Males, P. J. Duffy. Master Breeder: D. Curry.

THE Best Fish in the Show at the Coventry Pool and Aquarium Open Show was a Neon Tetra owned by Mr. B. C. Roberts of Solihull. This fish qualifies for the British "Champion of Champion Fish" contest to be held at Belle Vue, Manchester, later in the year. Full Table Show results were as follows: Guppies: 1, S. Dean (Tamworth); 2, Mr. and Mrs. Cox (Nuneaton); 3, Mr. Edkins (Nuneaton); 4, Mr. Whitmore (Rugby). A.O.V. (Livebearers): 1 and 4, Mr. and Mrs. Delves (Buckington); 2, L. Ball (Atherstone); 3, R. Roberts (Solihull). Danios, Rasbora and W.C.M.M.: 1, Mr. Trocmax (Atherstone); 2, Mr. and Mrs. Delves (Buckington); 3, R. Roberts (Solihull); 4, Miss B. Ball (Atherstone). Barb (up to 1 in.): 1, Mrs. J. Smith (Leamington); 2, Mr. and Mrs. Simpson (Bedworth); 3, D. Basingwood (Coventry); 4, S. Woodbridge (Coventry). Barbs (over 1 in.): 1, R. J. Hough (North Warwick); 2, Mrs. S. Leigh (Nuneaton); 3, Mrs. Hiron (Long Eaton); 4, E. Sheehy (Coventry). Dwarf Cichlids: 1, Mr. and Mrs. Simpson (Bedworth); 2, Mr. and Mrs. Winter (Northampton); 3, Mrs. S. Leigh (Nuneaton); 4, R. Simpson (Coventry). Cichlids: 1, R. J. Hough (North Warwick); 2, S. Dean (Tamworth); 3, Mr. Hiron (Long Eaton); 4, Mr. Trippas (North Warwick). Characins (up to 3 in.): 1, B. C. Roberts (Solihull); 2, Mrs. S. Leigh (Nuneaton); 3, B. and F. Hurst (Coventry); 4, Mr. Edkins (Nuneaton). Characins (over 3 in.): 1, R. J. Hough (North Warwick); 2, Mr. Edkins (Bedworth); 3, Mr. Whitmore (Rugby); 4, Mr. Treadgold (Cheltenham).

Anabantids: 1, Mr. Shakespeare (Bedworth); 2, B. Freeman (Nuneaton); 3 and 4, C. and R. Bates (Coventry). Killifish: 1, Mr. and Mrs. Cox (Nuneaton); 2, Mr. Trippas (N. Warwick); 3 and 4, Mr. and Mrs. Auccot (Nuneaton). Corydoras Catfish: 1, Mr. Shakespeare (Bedworth); 2, Mrs. J. Smith (Nuneaton); 3, R. Roberts (Solihull); 4, Mr. Mawby (Wednesbury). Catfish: 1, G. Steed (Tamworth); 2, E. Sheehy (Coventry); 3, Mr. Shakespeare (Bedworth); 4, Mr. Highfield (Wednesbury). Loaches: 1, Mr. Hiron (Long Eaton); 2, Mr. Dean (Tamworth); 3, Mr. Scally (Bedworth); 4, Mr. Sheehy (Coventry). Livebearers (Pairs): 1, Mr. Davies (Bedworth); 2, Mr. Walker (Loughborough); 3, Mr. and Mrs. Cox (Nuneaton); 4, Mr. Glover (Bedworth). Egglayers (Pairs): 1, Mr. Hiron (Long Eaton); 2, Mr. Padgett (Bedworth); 3, Mr. and Mrs. Auccot (Nuneaton); 4, Mr. Winter (Northampton). Breeders (Livebearers): 1 and 4, Mr. and Mrs. Delves (Buckington); 2, Mr. Walker (Loughborough); 3, Mr. Trippas (N. Warwick). Breeders (Egglayers): 1, L. Ball (Atherstone); 2, Mr. Walker (Loughborough); 3, Mr. and Mrs. Cox (Nuneaton); 4, Mr. and Mrs. Hurst (Coventry). Any other Tropical (under 4 in.): 1, S. Woodbridge (Coventry); 2, D. Basingwood (Coventry). Any other Tropical (over 4 in.): 1, P. Skinner (N. Warwick); 2, R. Shakespeare (Bedworth); 3, S. Blotman (Nuneaton); 4, A. Mawby (Wednesbury). Bristol Shubunkin: 1, 2, 3 and 4; B. Bromfield (Coventry). A.O.V. (Coldwater): 1, Mrs. S. Leigh (Nuneaton); 2, Mr. J. Hough (N. Warwick); 3, B. Bromfield (Coventry); 4, Mr. and Mrs. Simpson (Bedworth).

THE Members Show of the Aireborough and District A.S. attracted a total of 89 exhibits. Best in Show: High-fin Swordtail (Female of Pairs), owned by Mr. H. Gardner.

Other results were as follows: A.V. Guppy: 1 and 3, H. Gardner; 2, A. J. Marshall. A.O.V. Livebearer: 1, B. Megson; 2, H. Gardner; 3, E. Hunt. A.V. Barb: 1, J. Whitley; 2, C. Thompson; 3, R. Taylor. A.V. Characin: 1, G. Monk; 2, K. Bateman; 3, P. Hirst. A.V. Cichlid: 1, R. Taylor; 2, C. Thompson; 3, G. Monk. A.V. Fighters: 1, R. Taylor; 2 and 3, P. Iveson. A.O.V. Anabantid: 1, J. Whitley; 2, B. Megson; 3, A. Stretton. A.V. Flying Foxes and Sharks: 1, J. Whitley; 2, R. Taylor; 3, H. Hunt. A.V. Catfish and Loach: 1, J. Kay; 2, P. Iveson; 3, P. Hirst. A.V. Novice: 1 and 2, J. Stretton; 3, Mr. Skirrow. A.V. Junior: 1, D. Shaw; 2 and 3, A. Fletcher. A.V. Coldwater: 1, R. Lister; 2, J. Kay; 3, P. Hirst. Any Other Variety: 1 and 3, J. Kay; 2, R. Taylor. A.V. Pairs: 1, H. Gardner; 2, K. Bateman; 3, R. Taylor. A.V. Breeders: 1, G. Monk; 2, H. Gardner; 3, J. Whitley. Furnished Mini-Jars: 1, B. Megson.

IN June there were 76 entries for the Third Table Show of the year of the Merseyside A.S. The meeting was well attended and whilst judging was in progress members asked questions of the guest from Canada, Graham Wood. Naturally these mostly concerned differences between practices in Societies in Canada and here in Britain. Members were also eager to learn how prices of fish compared. Graham answered questions merrily for quite some time and he hopes when he returns home to put into practice some of the procedures which have

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impressed him at Society meetings which he has attended here. He also hopes to introduce some of the Open Show ideas.

At the close of the evening, the Chairman thanked Graham for taking the floor and asked him to accept honorary membership of the Society. He was presented with a Society badge, and on behalf of members, the Chairman wished him Bon Voyage on his journey home.

The award for the Best Fish in the Show went to Mr. Pugh.

LATEST Table Show results from Leamington and District A.S. Pairs (Livebearers): 1 and 2, P. Taggart; 3, E. Clarke; 4, J. Beard. **Egglayers (Single Fish):** 1 and 4, P. Underwood; 2, Mrs. C. Beard; 3, D. Beard.

RECENT Nottingham and District A.S. show successes at the Rainworth A.S. show: K. Binns was again successful with his Blue Acara's and received first and second cards. He was also second with a small barb and second in the Dwarf Cichlid class with a *Ramirezii*. W. Selby was first in the Gourami class with a thick lip, and first with a pink tail rainbow; and to round the awards off for Nottingham Mr. Pearson was second in the Goldwater class with a Black Moor. At Boston Society show two of the members obtained three first cards, K. Binns first, large Cichlids (Acara) first, Breeders (Livebearers), second Dwarf Cichlids and third small Barbs. The other winner was Mrs. Ivy Bullyment with a first card for a Loach in the Catfish and Loach class.

Table Show results: Barbs (over 3 in.): 1 and 2, W. Selby; 3, N. Kenney; 4, K. Binns.

THE latest journal of the Southend, Leigh and District A.S. contains quite a number of interesting articles on a wide variety of subjects of interest to all aquarists. The secretary of this enterprising Society is Mr. R. Wallings, 93 Salisbury Avenue, Westcliff-on-Sea.

THE June issue of the Wellingborough and District A.S. Newsletter contains quite an imposing list of new members bringing the total membership to about ninety. The table show was for Anabantids and the results was: 1, S. Priest; 2, Mrs. Ada Tupman; 3, C. Wright.

A TABLE show for Danios, Tetras and Anabantids was held at the June meeting of Hinckley and District A.S. Result: Tetras: 1 and 3, D. Sparrow; 2, M. Bishop. Danios: 1, M. Bishop; 2, D. Sparrow; 3, N. Pywell. Anabantids: 1, P. Morris; 2 and 3, C. Watkins. Also at this meeting a secretary change was made, the new official being D. Sparrow, 172 Brookside, Burbage, Leics.

New members are very welcome.

CHANGE OF VENUE

Cambridge and District A.S.: The new meeting place will be the Working Men's Club, Fitzroy Street, East Road, Cambridge. Meetings will continue to be held on the first Tuesday in each month, beginning at 7.30 p.m. Visitors welcome.

SECRETARY CHANGE

West Cumberland A.C.: J. Parker, 2 Southey Avenue, Orpington, Epsom, Surrey.

NEW SOCIETY

A NEW club has been formed in the Gateshead area called The Mount Pleasant A.S. The meetings are held at The Mount Pleasant Club, Split Crow Road, Gateshead, on the second and fourth Thursdays in each month at 8 p.m.

THE newly-formed South Derbyshire and District A.S. met recently and twenty aquarists within the Swadlincote and South Derbyshire area were present. Officers appointed were: Chairman: A. Hunt; Secretary: A. Clarke; Show Secretary: H. R. Brabbins; Treasurer: J. Hunt; Trustees: N. Fearn and T. Bowler. The Society meet on the first Wednesday in every month at 7.30 p.m. at the Gosminers Arms, Midland Road, Swadlincote. Full details may be obtained from the Secretary A. Clarke 13, Vale Road, Midway Burton-on-Trent. All new members are cordially invited.

AQUARIST CALENDAR

2nd August: Hull Show, Aquarist Open Show at East Park, Holderness Road, Hull. Details from P. M. Stephenson, 11 Beech Grove, Beverley Road, Hull.

2nd August: Stroud and District A.S. Open Show, Archway School, Paganhill, Stroud.

9th August: East London Aquarist and Pondkeepers' Association, Annual Open Show, Ripple Road School, Barking, Essex. Show schedules from G. Green, 70 Barton Avenue, Romford.

9th-10th August: Portsmouth A.S. Open Show, Portsmouth Community Centre, Twyford Avenue, Portsmouth. Open to the public from 11th August. Show schedules and information obtainable from Mr. J. Stillwell, Show Secretary, 34 Salcombe Avenue, Copnor, Portsmouth.

12th-16th August: Midland Aquatic Open Show at Bingley Hall, Broad Street, Birmingham. Show Secretary, J. Wirtz, 120 Franklin Road, Kings Norton, Birmingham, 30.

17th August: North Staffs A.S. First Open Show, Details from G. Stott 1, Oldmill St., Vennon, Stoke-on-Trent, Staffs.

17th August: Bedworth A. & P.S. First Open Show at St. James Parish Hall, Bulkington, Nuneaton, Warwickshire. Schedules from M. Lee, 57 Grant Road, Ebball, Coventry, Warbs.

24th August: Ocean A.S. Open Table Show, Recreation Hall, Refuge Street, Shaw, Oldham.

28th August: Cleveland A.S. Annual Open Show, British Legion Club, Guisborough, Yorks.

30th-31st August: Harlow A.S. Open Show at the Harlow Town Show. Schedules from M. J. Jarvis, 143 Carters Mead, Harlow, Essex.

31st August: Rochdale and District A.S. Second Open Show at the Kirkholt Community Centre, Kirkholt, Rochdale.

6th September: Bethnal Green A.S. Annual Open Show. Schedules can be obtained from J. Coombes, Show Secretary, Bethnal Green Institute, 229 Bethnal Green Road, London, E.2.

6th September: Rhondda A.S. Open Show. Full details available later.

6th, 7th September: Mid-Herts A.S. Open Show. Show Secretary Charles S. A. Withers, 15, Charmouth Road, St. Albans, Herts.

7th September: Seaham (Rock House) and District A.S. Sixth Annual Table Show, Rock House Community Centre, 17 Tempest Road, Seaham, Co. Durham. Show Secretary: A. H. Coulson, 17 Tempest Road, Seahaven, Co. Durham.

7th September: Barnoldswick, Earby and District A.S. Annual Open Show, Albion Hall Earby, J. Wiseman, Hon. Secretary, 20 Frederick Street, Barnoldswick, nr., Colne, Lancs.

7th September: Midland Aquarist League Table Show, St. James' Parish Hall, Bulkington, Nuneaton. Open Classes. Schedules from M. Lee, 57 Grant Road, Ebball, Coventry, Warbs.

12th September: South Park Aquatic (Study) Society, Open Coldwater Show at Sutton Adult School, Benhill Road, Sutton, Surrey.

14th September: Ealing & District A.S. First Open Show. Schedules from R. Barrett, 8 Grove Court, The Grove, Ealing, W.5.

14th September: Oldham and District A.S. Open Show, Wezeneth Park, Oldham.

14th September: The Nottingham and District A.S. Open Table Show, at the Drill Hall, Triumph Road, Nottingham. Schedules now available from Show Secretary, N. B. Kenney, 34 Leonard Avenue, Sherwood, Nottingham.

20th September: Hounslow and District A.S. Annual Open Show. Show schedules available from P. Smith, Anafra House, 7 The Greenway, Hounslow, Middx.

21st September: Stone A.S. Annual Open Show at Walton Community Centre, Walton, Stone. Show Secretary, M. Dale, 14 Lavender Close, Great Bridgeton, nr. Stafford.

27th-28th September: Cambridge and District A.S. Open Show at the Guildhall, Market Square, Cambridge. Schedules and enquiries to L. Geoghegan, 16 Leys Road, Cambridge, CB4 2AT.

28th September: Northampton and District A.S. Open Show at Kingsthorpe Community Centre. Schedules are available from R. Memory, 121 Booth Lane South, Northampton.

28th September: Hucknall and Bulwell A.S. Second Open Show to be held at Bulwell Youth Club, Coventry Road, Bulwell Road, Nottingham. Further details from T. E. Smith, Show Secretary, Longmead Drive, Daybrook, Nottingham, NG5 6DP.

28th September: Medway A.S. Convention. A new venture for this club with an interesting speaker and a chance for an aquarist get together. Details from Secretary, A. Clack, 6 Holland Road, Chatham, Kent.

5th October: Castleford and District A.S. First Open Show.

18th, 19th October: British Aquarists' Festival, Belle Vue, Manchester.

8-9th November: Heywood Horticultural Society/Heywood and District A.S. Joint Two Day event, Open Show, Sunday, 9th November, 1969.

9th November: Hartlepool A.S. Eleventh Annual Open Show, Langdon Hall, Seaton Carew. Schedules available from J. D. Watson, 42 Sydenham Road, Hartlepool, Co. Durham.

14th December: Horsforth A.S. First Open Show. Further details to follow.

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