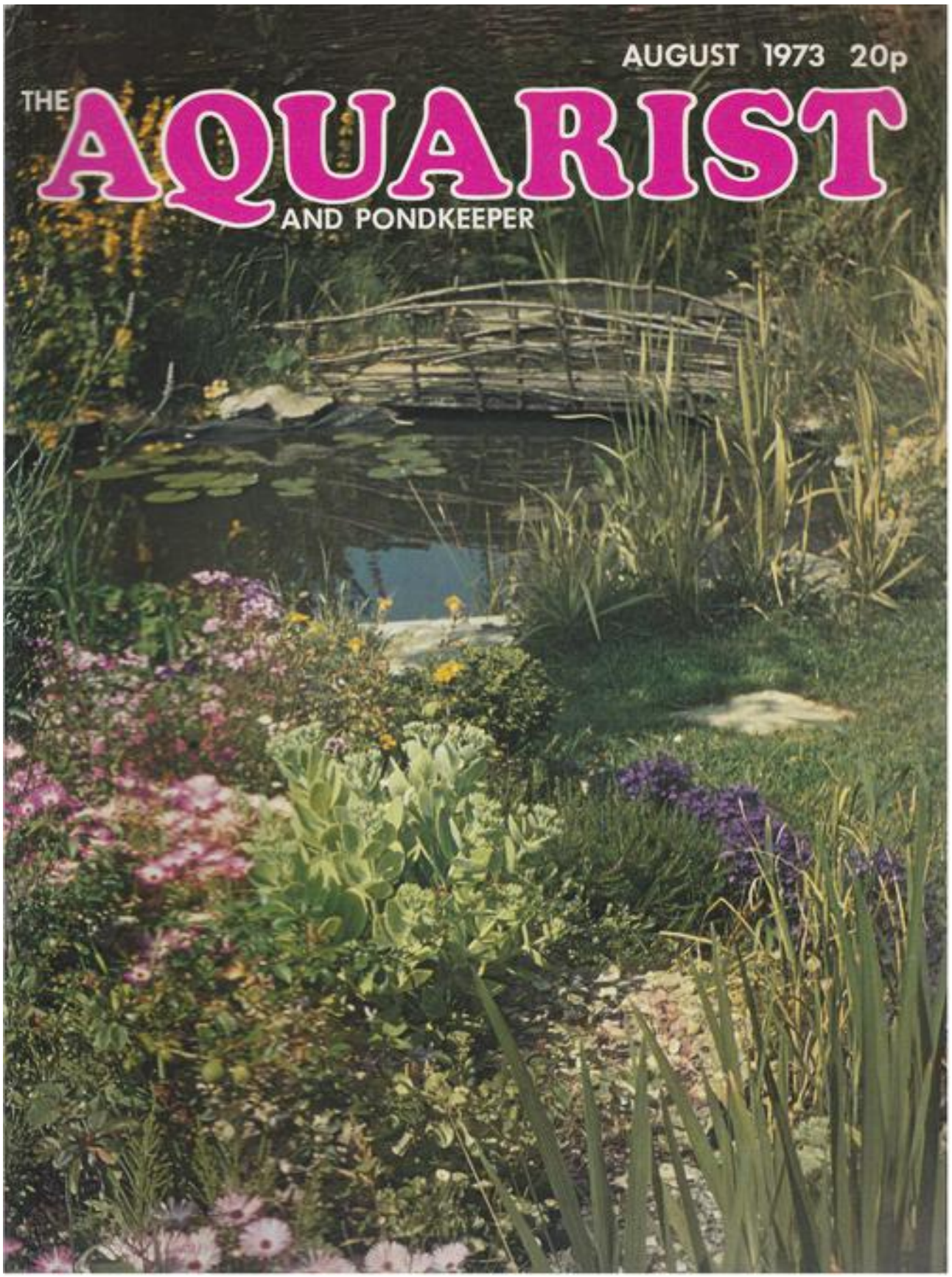

AUGUST 1973 20p
THE
AQUARIST
AND PONDKEEPER

THE AQUARIST AND PONDKEEPER

Published Monthly 20p

Printed by Buckley Press,
The Butts, Half Acre,
Brentford, Middlesex.
Telephone: 01-568 8441

Subscription Rates:
The Aquarist will be sent post free for one year to any address for £3·06. Half-yearly £1·53

MSS, or prints unaccompanied by a stamped addressed envelope cannot be returned and no responsibility is accepted for contributions submitted.

Founded 1924
as "The Amateur Aquarist"
Vol. XXXVIII No. 5, 1973

Editor: Laurence E. Perkins
Advertisement Manager:
J. E. Young

Contents

WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author

BEFORE I BEGIN on this month's letters, I feel that I should again point out that I do not necessarily agree with the opinions expressed by writers of letters to this feature; in fact, I often disagree strongly. However, as everyone is entitled to hold their own personal opinions, and as the feature is open to any letter writers, I like to include as wide a variety of views as possible. I have found it necessary to make this point clear as a very few recent letter writers seemed to think that the views expressed by contributors to the feature were views which I, too, held. Very often this is not the case at all. I don't write the letters; I only edit them and compile the feature!

Having made this point clear, I'll begin with a tip which was sent in by Mr. J. Davidson, of 16 Woodlands Crescent, Turriff, Aberdeenshire. He writes: "Recently I had to remove some silicone sealer from a tank in which I had to repair a leak, and I found out by accident that an excellent tool for removing sealer is an *algae* scraper fitted with a razor blade." (Do any other readers have tips which would be useful to aquarists?)

The postcard which I received from Mr. C. Codman, of 5 Whitmore Hill Cottages, Grayshot, Hindhead, Surrey, bore a brief message: " 'Yes please!' to an index for *The Aquarist and Pondkeeper*. Enjoy your column very much—I leave it until last, like dessert!"

Mr. L. McCourt is the proprietor of City Pets, Low Friar Street, Newcastle upon Tyne, and he writes: "Your wariness and lack of confidence in all glass aquaria is possibly unjustified." (I assume that Mr. McCourt is referring to Mr. P. S. Croft's opinions, on page 81 of the June edition. I did state clearly that " . . . *he* would be wary . . ."; not, that *I* would be wary!) Mr. McCourt continues: "I have been making these frameless tanks for my own use, and to customers' specification, for a number of years, and have one in use in our own shop containing 222 gallons, with dimensions of 10 ft. × 2ft. 2 in. deep × 18 in. wide. Four foots and six foots are standard lines, and other much larger sizes are no problem, providing care and commonsense are used. I must repeat that these are normal, all-glass aquaria, with no frame or support of any kind, but I must emphasise that certain mixes of so-called aquarium sealer are most unsuitable, cannot take large pressures, and are highly toxic to freshwater and marine aquarium inhabitants; in particular, the sealers used by glaziers and glass merchants who offer all-glass tanks for sale. The only two sealers that I can recommend, of the many I have tried, are Dow Corning and English Electric.

"I admire your column, being a staunch hobbyist, but feel that you do decry dealers in general too much, and should bear in mind that many dealers over the years have supported, lectured, judged, written and experimented on behalf of the aquarist, to make the aquarium hobby what it is today. Re 'Tropical Queries'—just a point: the tiger shovelnose catfish is correctly named *Sorubim lima*." (I am honestly unaware of decrying "dealers in general too much." As an ordinary hobbyist myself, who has "supported, lectured, judged, written and experimented" over the years, I have the greatest respect for the majority of dealers. In fact, one of my greatest disappointments at the present time is that I have been unable to visit a single dealer's shop since December of last year! If you would care to be more specific about my decrying of dealers, I should be pleased to attempt to supply an honest answer. After all, without dealers there would be no hobbyists—and without hobbyists there would be no dealers!)

The next letter, which comes from Mr. H. W. Stephenson, of Buxey, Oldhill Wood, Studham, Nr. Dunstable, Beds. LU6 2NF, concerns his attempts to join the B.K.A. He writes: "With reference to your article of June, where you gave addresses and subscriptions for the B.K.A.—like Mr. Leighton I joined the B.K.A. in 1966 but had to give up the hobby two years later. I am now setting up some tanks and as a result of your article decided to rejoin the B.K.A. I wrote to Mr. B. Devison, the Registrar, enclosing £1·25 as subscription from 1st April. Imagine my amazement to get back a note from someone signing p.p. Mr. Devison, saying that there is no half-yearly subscription. The note was on the back of my letter. This, to me, is the ultimate rudeness in correspondence as it leaves the B.K.A. with no record of my existence. Would you please warn your readers that they can join the B.K.A. only from 1st September, and to treat the friendly association myth with suspicion." (I obtained the information from a leaflet entitled: "Introduction to the British Killifish Association,"

which was sent to me. The relevant paragraph states: "The Yearly Subscription from 1st September is £1 10s. 0d. From 1st April to 31st August 17/6 new members only." Further down the leaflet, on the application to join section, the sums of £1 10s. 0d and 17/6 have been changed, in pen, to £2·50 and £1·25. Perhaps one of the officials of the B.K.A. would let Mr. Stephenson, and me, know exactly what the present position is regarding half-yearly membership).

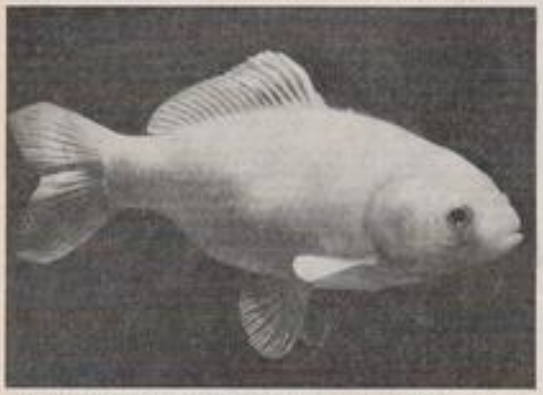
Photograph 2 shows the standard "old faithful"—the common goldfish—which must have played a big part in attracting many of us to the hobby. What have been your experiences with the breeding of goldfish this year?

This photo (which was omitted from the May issue) shows one of my tanks with an airstone, not normally used in my tanks.

Mr. M. Hemmings lives at 4 The Templars, Oldbury, Birmingham, B69 1EU, and he writes: "I would like to say that I think the monthly publication is just fine, but I would like to see an index of articles published for easy reference." Mr. Hemmings goes on to say that he keeps a 6ft. tank at home, but due to lack of extra space in his home he has no room for other tanks; however, he looks after tanks for relatives, schools, social service homes, etc., and this has many advantages in that he can experiment with a variety of permutations of lighting, filtering, fishes, plants, etc. He thus obtains a variety of results which he finds most useful. His "guinea pigs"—for want of a better term—are all quite happy with the results as they have only to feed the fishes. Mr. Hemmings has found that if the fishes in a tank which has been aerated using an airstone are suddenly deprived of the extra aeration, they gasp at the water surface—even in a tank which is not over-crowded. Mr. Hemmings once kept three small terrapins in his community tank, with no ill effects on any of the fishes. The terrapins were very fond of dried *tubifex*; and they often climbed out on to the top glass to "sun" themselves under the Gro-Lux light—despite a plastic landing stage being built for them. They sometimes tended to wander too far, and fell down the back of the tank—but they never harmed themselves. Mr. Hemmings got his biggest fright when the terrapins appeared to have fungus "hanging off them"; but it turned out to be only their skin peeling off and hanging in threads. This happened about once every six months. His wife and child often played with the terrapins on the floor, and it appeared not to harm them. He got rid of them when he heard on TV that a killer disease was being brought into the country by terrapins—but he now feels that his would have been safe after having spent twelve months in his tank.

More news about terrapins comes from Mr. M. Waller, whose home is at 2 All Saints Road, Lowestoft, Suffolk. He kept three red-eared terrapins in a 2 ft. tank, with temperature set at 70°F. The tank contained only two pieces of standstone, a corner filter and some floating plants. The water was about 9 in. deep, and a piece of floating cork bark provided a sun bathing platform. When two Spanish terrapins were added, it became necessary to change the water at least once per week—depending upon what food

had been fed to the creatures. One evening, only two red-ears appeared at feeding time, and Mr. Waller found the missing one trapped under one of the sandstone slabs. It was fished out, declared dead, and placed on the tank cover. Half an hour later the "dead" terrapin was wrapped in a piece of damp cloth—which was covered in wax paper and placed in a paper bag. The package was placed in a duffle bag to be taken to work next day, the aim being to see if a friend of Mr. Hemmings, who does plastic casting, could use the terrapin to make a paperweight. At 1.40 the following afternoon, the surprised friend was handed the package. "I can't do anything with this," he said, "it's not even dead!" It wasn't! Even after twenty hours of inappropriate treatment, a "taxi" had to be arranged to take the terrapin home. That night it was swimming happily in the tank. Mr. Waller considers that his experience shows that the keeping of terrapins should present no problems—even to inexperienced aquarists.



Mr. Waller has kept and grown most of the popular plants—e.g., *Cryptocoryne*, *Vallisneria*, *Hygrophila*, water lettuce, swords, etc. He finds they all do well if given time and plenty of light. His water lettuce grew to approximately 1 ft. in diameter, and flowered. Originally he bought five plants, and in the end had to give many young plants away as the adults multiplied so frequently. His tanks received about 12 hrs. of light per day, from two 60 watt bulbs over 15 in. deep tanks. Mr. Waller offers the following tip which saves him money on food for baby fishes. He places some flakes of fish food in the palm of his hand, adds a few drops of water, and mixes a paste. A paste can be mixed such that it does not float on the water surface when washed from the fingers. He wonders if readers could give him some advice on a problem with which he has had to contend. He purchased a culture of micro-eels and fed them to young keyhole cichlids on two occasions. He lost both spawnings, although he did not over-feed them. He wonders what other readers' experiences have been with the use of micro-eels. Mr. Waller ends by making one complaint about *The Aquarist*. He says that, compared with other hobby magazines, e.g., hi-fi, cars, etc.—ours is not such good value for money. He says that pages number fewer, and are rather smaller in comparison with magazines costing the same price. (I have no authority to speak on this subject, but as one who was recently bitten very badly by the hi-fi "bug", I have consumed large numbers of various hi-fi magazines. They are certainly bigger, and have more pages—but they do contain a vast amount of advertising material. Some of the largest discount houses have as many as seven pages of advertisements—and editorial pages are often shared with, or interspersed with, advertising materials. Many more people have hi-fi than have fishes, and, hence, there are many more advertisers—and remember, advertisers assist greatly in keeping magazine costs down. I still think that *The Aquarist* is good value for 20p—and one usually gets a full run of editorial pages without commercial advertisements being included on them or between them. In some foreign aquarium magazines one often has to search to find the editorial matter among the advertisements—with or without coloured plates! Do any readers have any idea—even a rough one—of about how many aquarists there are in the U.K.? I'd be interested to hear.)

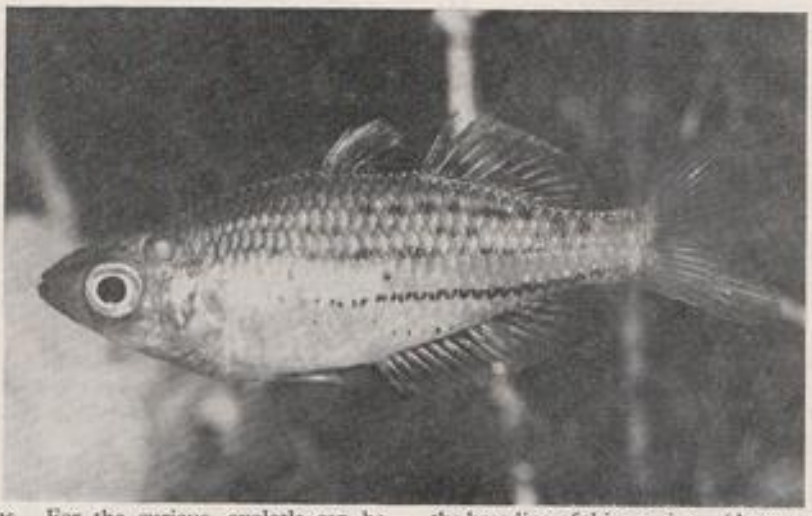
In the June edition I included some comments about tortoises—although someone along the line obviously decided to remove my letter "s" from tortoises, making the singular and plural the same. This brings me to a letter from Mr. S. Polley, who lives at Sherburn House, Buckton, Bridlington, East Yorkshire, YO15 1HU. In November, 1971 he had three spur-thighed tortoises, and he put them in a well packed box in a cool outhouse; but every week one of them woke up for a while. Every time they were checked, one had climbed to the top of the hay. Eventually they had to be brought into the house and kept awake. They wouldn't eat—and Mr. Polley spent the winter retrieving tortoises from the landing and from under cupboards, etc. They were finally persuaded to eat wet lettuce. They spent most of the winter nights scratching their nails against the skirting boards! When spring came, the tortoises developed a mouth disease—a spongy, yellow growth which could be fatal. With the vet's help they were cured; but later one of the three died of an unknown cause. He was replaced by another. The three got through the summer of 1972, with only a few minor problems, and were placed in a box to hibernate. After sleeping for one and a half months, Mr. Polley was forced to take them into the house again. Scratch! Scrape! Creak! —and more soggy lettuce! Now, at last, they are out in the sun again—and Mr. Polley wouldn't

sign anything about their going to sleep *at all* in the last two years. (At the moment—mid-June—my own tortoise is poised on the top of a pile of your letters on the centre of the dining room carpet. I just hope that he has no plans to eat them!)

Mr. Polley wonders how I can consider axolotls to be ugly. "Fluffy gills, flatish friendly faces, sleek bodies—how could you call them ugly?" he asks. (Quite easily, would be my reply—without being too serious!) He continues: "For the person who wants little to do in the way of upkeep, axolotls are fairly undemanding, using either unheated or slighlty warm water only, and eating any garden worms or white worms or pieces of meat. For the breeder, axolotls are one of the few amphibian species that have been bred successfully and easily in Britain, and it should be possible to pair them after collecting a few specimens. For the curious, axolotls can be induced to change into salamanders by very gradually lowering the water level until they are forced to use gills less, and change to using lungs." Mr. Polley ends his letter by saying that axolotls can be cooked and eaten, and are sold in the Mexican fish markets. (No thanks!)

Mr. J. Hammond's address is 19 Rae Avenue, Kings Estate, Wallsend on Tyne, Northumberland NE28 9JP, and he is a cichlid fanatic. In reply to Mr. R. Loten's query (May edition) regarding *Chaetobranchopsis bitaeniatus*, Mr. Hammond says that the fish is very quarrelsome and is also a digger —the opposite to Sterba's descriptive details. (In Sterba's defence I would point out that he states: " . . . said to be very peaceful . . . ".) Mr. Hammond enclosed a fine photograph of his fish—which has since "got the boot as it was interrupting a pair of *G. jurupari* which has since spawned". He also sent me two other high quality photographs—one of his eight female severums, and one of a male *G. acuticeps*. Mr. Hammond also asked me to inform readers that he has taken over the post of Northern Representative of the British Cichlid Association, and that all letters from Northern readers, to his address, will be welcomed and promptly answered.

15 years old John Evans's home is at 22 Church Street, Up-Holland, Nr. Wigan, Lancs. WN8 0ND, and he writes to say that he has had an unusual spawning of the opaline gourami. The male didn't build a bubble nest, but just kept the eggs in a corner of the breeding tank in a mass of *Cabomba*. John has bred convict cichlids twice, and the fry were well guarded. They are now 1 in. long. He asks if the dwarf cichlid, *Apistogramma steindachneri*, is rare, and would like to know of readers' experiences with the breeding of this species. (An account of the breeding of this fish appeared in our February issue, 1973 [Ed.]).



Photograph 2 shows the Australian rainbow. I'd be pleased to hear of your experiences with the keeping and breeding of this fish.

Mr. Terry Green, who lives at 12 Greenwood Meadow, Chinnor, Oxford, thinks that W.Y.O.? is a good way of "cramming a good deal of information into a very small space", and for this reason it is part of his priority reading each month. He doesn't agree with everything said in these columns, and finds much pleasure in soundly condemning some opinions. He writes: "I have a suspicion that I'm not the only one who indulges in this pleasure! If this 'contributor bashing' is undertaken in the proper spirit I am sure that no harm is done; indeed much necessary discussion, and therefore good, may come of it." He goes on to say that he is very much 'anti community tanks', and he condemns

undergravel filters as useless and dangerous—from a pollution angle. This leaves him with "the box type, either in or out of the tank". He finds that such filters need to be changed every two days, and not every two weeks as some people advocate—but he does admit that he keeps cichlids. He feels that most people put too much filter medium in their filters, thus preventing a good flow of water. Mr. Green says that he was interested to note that one correspondent thought that his filters were to blame for the death of his Anabantids; Mr. Green has a sneaking suspicion that the cause of death might have been a species of *Ichthyosporidium*. He says that this infection is endemic to these fishes, and only requires a lowering of water temperature, by filters running at night, to spark it off. He states that the moral is that filters should be switched off at night—unless one has 24 hour heating. Mr. Green says that if one experiences mass deaths over a short period, it always pays to examine one's tank layout closely. He lost endless fishes from one of his tanks—all dwarf cichlids, and all from bacterial infections. When his purse had run dry, he examined his tank—and found that "a mountain of filth" had built up, unseen, behind the rocks in the rear corners of the tank. He then used his siphon, and had no further trouble since.

He says that we are always urged to use live foods, yet when it comes down to it the usual ones, i.e., *Daphnia* and *Tubifex*—seem to bring more troubles from infections than they alleviate by dietary correction. He has solved this problem to his satisfaction by feeding small quantities of dried foods, and chopped liver and larger quantities of chopped earthworms. He keeps the worms in his freezer—much to his wife's disgust—as he finds that this makes them easier to chop; he can also have a winter supply using the freezer method. His source is a small portion of flower border, untreated with any chemical sprays, etc., but liberally dosed with used tea leaves. He wonders if aquarists are too fussy about hardness and temperature, and points out that surely, in those parts of the world where monsoons are the major source of water, the evaporating ponds will become gradually harder—only to be suddenly softened by a downpour of rain. He accepts that lower temperatures appear to trigger off diseases—indeed accepts it as a proven fact—yet when he walks along a river bank on a very hot day, he often sees fishes in the inch deep shallows sunning themselves. When startled they dash into cold, deeper water. "Surely this temperature gradient is much greater than anything we have to offer at home," he says. He ends his five page letter by asking for readers' opinions on the keeping and breeding of the chessboard cichlid—*Crenicara maculata*. (Any advice, please?)

My thanks to the Federation of British Aquatic Societies for the latest copy of their stimulating Bulletin. It's a very well produced magazine, considering that most of it seems to be duplicated.

Well, those are all the letters for which I have space this month. If you are writing to me, please try to keep your letters down to a couple of pages, if possible; print your name and address—and any correct names of fishes or plants; date your letter; and address it to me c/o. *The Aquarist*. I would like to have your opinions on the following subjects for next time: (1) Details on how you grow your favourite species of *Cryptocoryne*; (2) Your experiences with different brands of commercial "cures"; (3) Details of the type of aquarium background which you use; (4) Any further news or views on keeping Discus; (5) Your views on aquarium "ornaments"; (6) Your design for a planting stick which works! I look forward to receiving your letters.

PRODUCT REVIEW

Reliant Nitrite Level Test Kit, manufactured by Reliant Products, Basildon, Essex, and distributed by C. J. Skelton, Aquarist, Chelmsford, CM2 7TR; price unknown at time of writing.

This new Reliant Nitrite level test kit is "for determining the presence and concentration of nitrites in in aquarium water", and is equally suitable for fresh or salt water testing. The kit consists of a clear plastic container, with white lid, for the test sample of water; a plastic dropper bottle containing the indicator solution: and a colour/instruction chart. An advertising leaflet supplied to me, gave the advantages as being: "1. A new indicator. The first available which is not carcinogenic. 2. A stable indicator. 3. A wider range of nitrite level readings. 4. More sensitive. 5. Very smart updated coloration chart and instructions." (For those who may not know, carcinogenic means something which produces cancer.)

The technique used is to half fill the testing phial with a sample of water; add three drops of indicator solution; replace lid on phial and shake once; and compare resulting colour produced with those on the colour chart. Five grades of "colour" are given: from colourless, through pale yellow, to deep yellow, and the five "colours", in order, represent 0, 10, 20, 30 and 40 p.p.m., approximately. The instruction chart gives clear details of the possible causes of raised nitrite levels, and states the steps which should be taken if the levels found by testing are excessively high.

I tested samples of water from a number of my tanks —all freshwater—and found that, fortunately for my fishes, there was very little or no nitrite present in the water. (This test, of course, is one where one hopes to obtain a negative result—and the results of my own use showed that no action was required to adjust my tanks' water condition.)

My only complaint about the kit which I received was that even after trying for five solid minutes to fit the white plastic lid on the water sample phial, I totally failed to do so. Two friends were no more successful than I was at getting the lid on; however, I found it quite simple to cover the open top of the phial with the flat of my hand and then shake the phial once.

This simple kit should prove to be useful to aquarists who need to test the nitrite level of their tanks' water —particularly if they keep marine fishes.

Mini-Long Diffuser Stone, made in Germany and carrying the Hobby label, is distributed by Hillside Aquatics, 29 Dixons Hill Road, Welham Green, Nr. Hatfield, Herts. Price unknown at time of writing.

Some months ago I reviewed Hobby's "Long-Long" diffuser stone; the "Mini-Long" is almost identical, except that it is 5in. long—making it particularly suitable for the smaller tank, whether marine or freshwater. Another interesting feature is that a series of "Mini-Long" stones can easily be slotted together to make any length of diffuser stone that is a multiple of 5in.

Like the "Long-Long", the "Mini-Long" produces an exciting stream of fine bubbles along its length—resulting in a delightful "mist" effect rather like a waterfall in reverse. One "Mini-Long"—or several in combination—placed at the rear of a tank, can provide an aesthetically pleasing feature in an aquarium —as well as good aeration and water movement.

If you use air stones, try one or several "Mini-Long" diffuser stones. I think you'll like the effect produced!

Kenray: Multi-purpose Filter, 6ft. Siphon Set, and **Inside Filter,** manufactured by Kenray (Patented) Products Ltd., Commercial Place, Lake Road, Portsmouth, Hants. PO1 4DT.

I don't know how many times, during the years in which I've kept fishes, that I've sucked a siphon tube and got a mouthful of none too clean aquarium water but with the introduction of the Kenray 6ft. Siphon Set it would appear that I will no longer have to contend with this problem. The new siphon set consists of two lengths of clear plastic tubing, with a white plastic bellows situated in the centre.

The operating instructions given are: "1. Place hose into tank and bring bellows below water level. 2. Depress bellows, pinch fold outlet tube just below bellows or place finger over end of outlet tube. 3. Release bellows and as water enters the bellows release outlet tube. 4. As siphoning starts depress bellows once more to exclude air."

It may sound a little complicated on paper, but in practice it takes but a few seconds—and behold the siphon is operating at full power, the tank is emptying, and one's mouth has not been involved in any way! I feel that this new product should prove to be very popular with any and every aquarist—particularly as the cost is only 45p plus V.A.T.—and it can deliver 60-80 gallons per hour, depending on the height of tank to outlet!

The Kenray Inside Filter costs 60p plus V.A.T., and is a sturdily constructed cylindrical unit which is attached to the inside glass of the aquarium by two clear plastic "suckers". The design of the filter is rather complicated; in fact, it would take a great many written words to try to describe it; but its working method can be understood fairly easily if one sees the product—or a drawing of it. (Possibly an advertisement showing a drawing of the product may appear at the same time as this review appears on *The Aquarist*.) The claimed advantages of the filter, as given in a printed leaflet, are: "1. Reduces the cold spot at the bottom of the aquarium. 2. Can be positioned to draw the water over the heater. 3. Greater water circulation area. 4. Filters efficiently for very long periods even when the filter medium appears to be clogged."

The unit is about 6in. high, by about 2¼in. in diameter, and thus would require to be concealed at the rear of the tank by those aquarists who, like myself prefer "hardware" to remain unseen in decorative aquaria. This point would not arise if the filter were to be used in a non-decorative tank. This robust filter should suit those who like inside filters.

The Kenray Multi-Purpose Filter seems to be not so much a filter as a way of life! You name it, and this outfit seems to be able to do it. It costs £1.50 plus V.A.T., and is supplied with an extensive instruction booklet—written in English, French and German. The booklet is well illustrated—which is most useful, considering the uses to which the filter outfit may be put. Again, the complete system is too complex to describe. The basic filter "component" is virtually identical to the previously mentioned inside filter, but the pack also contains other items—such as a siphon unit, securing straps, extension tube etc.

If you require a versatile outfit which may be used as inside filter, outside filter, "ordinary" siphon or aquarium "vacuum cleaner", then the Kenray Multi-Purpose Filter could well fulfil your needs. If possible, see an illustration of both this and the previous filter; better still, examine them at your dealer's shop.

Kenray Products are distributed by Peterama Ltd. Church Road, Harold Wood, Romford, Essex.

B. WHITESIDE.

OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE
All queries MUST be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

COLDWATER QUERIES

by Arthur Boarder

Are male toads likely to cause the death of three fair sized three-year old Koi? We found them in the pond bruised on their sides. We have toads in the pond

Male toads can kill fishes and are likely to do so if they cannot find a female with which to breed. The males have a tendency to grasp anything with which they come in contact when ready for breeding. Their front legs are very powerful and once they get a grip on anything alive they are most difficult to release. I have seen male frogs in a natural pond with one clasping another and then a third one clasping that one. Once a male toad pairs with a female it is very unlikely that it will release its grip until the female has laid her eggs. This is when the male releases the milt which fertilises the eggs. If unattached toads are seen in the pond it is advisable to remove them to a pond a good distance away.

The same danger can be experienced with frogs, and I have had this trouble on two occasions although I never get toads in my pond. Toad tadpoles make good scavengers as they can eat most types of food. They are not likely to be eaten by goldfish as once they get about half-grown they appear to have a type of poison on them and are rejected by goldfish, whereas frog tadpoles are eaten avidly.

We have two seven-inch golden orfe which have large white blisters on their fins. This is not fungus and an immersion in a fungus cure for three weeks brought no improvement. What do you think it is, the fins are rather torn?

I have not come up against this trouble and am not sure what it can be. The fact that the fins are torn can mean that the fish have been suffering from a form of fin-rot. The trouble is not white spot as this appears as tiny white raised dots. You state that this is only on the fins and not on any part of the body. The torn fins could be the result of an attack by a cat, but usually orfe are too fast for a cat to catch. I wonder if the blisters are filled with water or pus? It might be a good idea to prick one of the blisters and then keep the fish in a salt solution for a few days to see if any improvement takes place. I suppose that I am old fashioned in my cures but I have yet to find anything better than salt for most of the external injuries on goldfish. My method is to place the fish in a shallow container such as a plastic washing-up bowl. Put the fish in the water and add a tablespoonful of sea salt to each gallon of water. Do not stir but allow the salt to dissolve gradually. Tidmans sea salt has always done the trick for me. In bad cases of fin congestion it will be found that it is better to raise the temperature of the water to about 65°F., and use slight aeration. The fact that the blisters run practically the length of the fins make it more difficult to explain, as most blisters I have come across would be compact and contain some form of parasite and pus.

I have six goldfish which measure (without tails) 16 ins. in a tank 24×12×12 in. Is it overcrowded and is it possible that these fish might breed? I have a filter.

The tank should not have more than twelve inches of fish. It is possible to keep alive more fish than this with aeration but I still would not recommend anyone to try this. It is one thing to keep fishes alive but another to keep them healthy. Although your fish could breed in the tank, assuming that the two sexes are present, the chances of rearing any fry are rather remote. Most goldfish will eat their eggs soon after they are laid, especially if one or more of the fish are not interested in the actual spawning. Also, if any fry hatch out they would be also eaten. One good method of breeding would be to remove the fish to another tank once some eggs are seen. This is a better method than to try to remove the eggs from

a furnished tank. Although some eggs could be removed it is almost certain that many more could be left behind.

I have some young lionheads which are nine months old. They are being attacked by red pest disease. Can you offer me a cure please?

If this is what I suspect it is the trouble is caused by a bacterial infection. It may have been caused by impure water or conditions which are not to the liking of the fish. I have heard of this trouble being caused by too cold water. The young lionheads appreciate a warm temperature and if they are not given any artificial heating at all, this could be the cause. Try the fish which are affected in a sea salt solution of a desert spoon to the gallon of water and raise the temperature to 65°F. Do not fed the fish whilst under treatment and it is probable that the red will clear up.

I recently purchased some *daphnia* and soon feeding them to my fish they all developed white spot disease. If I keep the *daphnia* in a small pond for a few weeks will the white spot parasites die off or would they use the *daphnia* as hosts?

I am constantly warning readers about the danger of feeding *daphnia* to fishes if you are not sure that the source of them is safe. It is probable that the *daphnia* were caught from water which contained fishes and these could have been infested with the parasites. Freshly hatched parasites are very tiny and could have been missed by you when feeding with the water fleas. If the *daphnia* could be kept in a pond which had no fish or water snails in it, it is probable that the parasites would soon die as they must find a host or perish in a matter of hours. You would have been wiser to have placed the *daphnia* in the spare pond for a few days before feeding with them. If they could be carefully sorted out with the aid of a strong magnifying glass it is possible to collect some *daphnia* without including any pests. Home bred *daphnia* could be a very useful food especially for young fish and if two small ponds or large tanks could be used, one could be kept free of them whilst plenty of infusoria was cultured to be used later.

I have an adult bubble-eye goldfish which has suddenly developed some kind of trouble which prevents it from closing its mouth. It appears to be quite healthy otherwise and swims with erect dorsal fin. It cannot eat as it seems unable to swallow anything it takes into its mouth. Is there any cure?

I have heard of this trouble with bubble-eyes before and I am sorry to say that I do not know of any lasting cure. In one case I knew, massaging of the jaws was tried and also the bubbles were pricked. However, this form of lock-jaw seems impossible to cure. It is possible that if the locking of the jaws was noticed in the early stages and the mouth was forcibly closed it may have been of help. It appears that this trouble can affect adult bubble-eyes and it may be something in their make-up which makes them liable to such conditions. I have thought that the unnatural formation of the bubble near the muscles of the jaw has encouraged some weakness there. It may be that the fish have not been kept in warm enough water although these fish are recognised as coldwater fish, it is a fact that they appreciate a warm water and to rear them successfully I suggest that a temperature of not less than 65°F., should be used. One of 70°F., is best for hatching and rearing for the first three months and then a slight reduction in temperature will tend to keep the fish healthy. It must always be realised that when warm temperatures are being used it is important to use some artificial aeration.

One of my home-bred goldfish keeps darting up to the top of the water to take in a bubble of air. It then descends and blows out the bubble. It is the only fish which does this and it appears otherwise healthy. What is the cause of this action?

I have known goldfish in a garden pond act in this manner. There does not appear to be any particular reason why a fish should do this. It is not because the water is lacking in oxygen or all the fish in the tank would act in the same way, although when water is so lacking, the fish will mouth at the surface and remain there for most of the time. I suppose that one must expect individual fish to act in different ways to the majority as in most animals one usually finds one which has some peculiar trait. I have occasionally noticed one of my fantails in the pond act in a similar manner and have known this to happen when the weather is warm, which would indicate that the water might lack oxygen, but as only one or two fish do this the reason still seems obscure.

We had a lot of frog-spawn in the pond and plenty of tadpoles emerged. After a time they all disappeared. Do you think that the goldfish could have eaten them as we saw them swimming about near where the tadpoles used to be?

Goldfish will eat frog tadpoles as fast as they can and it is probable that your goldfish ate the frog tadpoles as soon as they were free-swimming. However I have seen blackbirds eating them in my pond. They did so when the tadpoles were small and kept to the edge of the pond where they were eating *algae* from the sides. Later on I found the blackbirds eating my fantail fry from tanks in an outdoor frame. This frame had been opened to let in more air and so the birds had a fine feast, quite clearing some tanks of the fry. If you wish to raise some frogs from the spawn it is necessary to collect some of the spawn just before

Embryo of common frog showing elongation of egg on right.

it is due to hatch. Soon after being laid the embryo show up quite round but near the time of hatching they take on a shape more elongated. Take up the spawn with a saucepan by pressing it into the water by the spawn. It will then run into the saucepan. Keep in a shallow container and give plenty of space as each bunch of spawn can contain hundreds of tadpoles.

The water in my garden pond has become quite opaque and smelly. I have fed the fish every day with dried food but as I cannot see the fish I do not know if they have eaten it or not. What can I do to improve matters?

You should not have fed so much dried food. This has not been eaten by the fishes and so it has polluted the water. The pond water must be changed or you will find that the goldfish will die. In my pond the goldfish have not yet come on to feed and it is already well into the latter half of May. The fish are not yet active enough to feed well as the water has been so very cold. There have been many cold nights in my district and I expect that it has been the same where you live. In one of my ponds I have a few breeding ribbon-tails and they have not been seen by me for some weeks. They are well down in the water plants and cannot be seen. In the larger pond where the ordinary fantails are I only see the fish when the sun is shining and they laze under some bunches of duck weed. They are not swimming about and so I would not think of feeding them whilst they are so inactive. If the sun warms the water up a little by day, it is so cold at night that the water soon loses its heat. I cannot remember one mild night yet this spring. When you see the fish swimming about and sucking at the plants and sides of the pond you can start to feed but not before.

When we moved to Cornwall we made a fairly large pond. We dug out a large hole, lined it with plastic and sheets of cardboard. We then placed a sheet of liner over it and filled with water. After a time grass grew up through the liner. The liner is a well-known type. What can we use on the grass to kill it?

The sample plant you sent is not grass but a type of reed. I think it is *Phragmites communis*, known locally in Cornwall as Goss. It is a strong growing reed-like plant often used near the sea to bind together the sand. The strong reeds are also used for thatching. You think the liner was of poor quality, but I have tried a piece of stretched Butyl liner and find that a sharp pointed stick and not a stout one at that, will pierce through it. As your reed has very pointed shoots it is possible for it to grow through the liner. It is well known that mushrooms can grow up through concrete or an ashphalt pavement. If you try to use a strong weed killer you could kill the fishes. A type known as S.B.K. is a brushwood and weed killer but you could not use this near the water. I can only suggest that the roots, which are like strong cord, must be cleared from the site before trying to lay the liner.

TROPICAL QUERIES

by Jack Hems

We should like some information on keeping and breeding the small Egyptian mouthbrooder (*Haplochromis multicolor*).

This species does very well at a temperature in the middle to upper seventies (°F.). It is not faddy about its food and will readily accept fragments of red meat and the usual dried foods as well as preferred live food such as tiny worms and *Daphnia*. It is safe in a community tank with other fishes of about its own sizes. The species deposits its eggs in a depression in the sand and after spawning is over, the female takes them into her mouth. There they are retained until they hatch out in about ten days to a fortnight. A tank about 18 in. by 10 in. by 10 in. is quite suitable for breeding.

Could you give me some information on *Gymnotus carapo*?

G. carapo, popularly known as the banded knife fish, is native to most of tropical South America east

of the Andes and attains a length of about 2 ft. (in the natural state, at anyrate). It grows into a quarrelsome fish and is best kept by itself or with other fishes of near enough its own size. It should thrive well on a diet of earthworms, raw red meat, raw white fish such as cod or fresh haddock and unwanted livebearers. Do not think of keeping a banded knife fish in a tank less than 3 ft. long.

Will two clawed toads (*Xenopus laevis*) be happy in my tropical aquarium housing a collection of livebearers, tetras and small barbs?

Keep this fascinating but greedy amphibian from South Africa out of your tropical aquarium. It has a large mouth and an appetite to match. The place for *Xenopus* is a tank minus fish maintained at normal room temperature. Keep the tank covered and give the toads earthworms, strips of lean meat, anglers' maggots and uncooked white fish as food.

Is it true that salt in the aquarium will kill catfish?

Some catfish are more sensitive to salt than others, but the majority of popular species as, for example, *Corydoras paleatus* and *C. aeneus*, will stand up to a teaspoonful of pure salt to every gallon with no harm done.

Would you recommend a puffer fish (*Tetraodon fluviatilis*) as a suitable occupant for a community tank?

Most puffer fishes are ardent fin-nippers and bullies and they are best kept by themselves or in a large brackish water tank given over to well-grown and rapid moving Malayan angel fish or scats.

I have been informed that most species of acara (*Aequidens*) are well-behaved and quite suited to sharing quarters with other fishes. Is this true?

It is not true. Very few species of *Aequidens* are community tank fish. Perhaps the most docile of the lot is the keyhole cichlid (*A. maroni*). According to an Americam publication, the most unfriendly is *A. rivulatus*.

I have just set up a tank and have noticed a white fluff or mould on the bottom. Please give me a reason for the appearance of this mould and will it harm the fish?

In all probability you are feeding more dried food than the fish in your aquarium can manage at a time. Uneaten food will soon decay and result in unsightly moulds and polluted water. Loosen the growths with a planting stick and siphon them away without delay. Feed the fish less generously and read as much as you can in the reliable aquarium books on the care of fish in captivity.

Could I keep two Texas cichlids in a 4ft. tank housing fishes of the genus *Leporinus*?

Certainly not. The Texas cichlid is quarrelsome and is not suited to living with other fishes unless they are as large and as heavily built and as assertive as itself. Even then it is likely to cause trouble.

Please give me some information on *Haplochromis desfontainesi*?

H. desfontainesi ranges in the natural state over a wide area of North Africa. It is a warmth-loving species and flourishes best at a temperature in the upper seventies (°F.). It attains a length of about five in. The female is the smaller and less brilliantly coloured of the two. It breeds like the common Egyptian mouthbrooder (*H. multicolor*) and the male becomes very spiteful towards any other fishes sharing the same tank. Most live foods, and substitutes for live foods, suit it.

My 36 in. by 15 in. by 12 in. aquarium is placed against a wall opposite a large window, and in addition to the good natural light it receives a fluorescent light and two 25 watt tungsten lamps are kept switched on for at least 12 hours a day. My problem is green water. I have tried to clear it by carbon filtration, but this makes no difference. I should appreciate your comments.

What you need is a forest of plants extending from about the middle of the aquarium to the rear glass and masking both ends. I suggest thickets of *Cryptocoryne affinis*, *C. griffithi*, *Sagittaria subulata* and warmwater grown *Elodea densa*.

The piped water in my area is rather soft and acid. How can I make it hard and alkaline to suit mollies?

Stir in a very small quantity of sodium bicarbonate into your aquarium ar intervals of half a day to a day and then test for DH and pH after each addition. Also add about a teaspoonful of non-iodized salt to every gallon of water in the tank. If the mollies are already living in the aquarium, make these changes very gradually; for a sudden change in the chemistry of the water is apt to upset any fish.

Could you please give me some information about temperature requirements, food and breeding procedure of the blue acara?

Aequidens pulcher (or *latifrons*) thrives best at a temperature in the middle seventies (°F), with a rise to the low eighties (°F) for breeding. The blue acara is not a faddy feeder and is quite contented if it is given its fill of various worms or meat supplemented with a well-balanced dried food. The fish deposits its eggs on stones or on the base of its tank, that is after the grit has been cleared away.

Does parrot's feather myriophyllum do well in the tropical aquarium ?

Parrot's feather myriophyllum does not do well in the tropical or coldwater aquarium. The place for it is the garden pool or conservatory or greenhouse. Its requirements are a pot of soil, shallow water, and a good top light. Its habit is to grow above the surface of the water and in so doing it loses the foliage on the lower or submerged stems. Although a native of tropical America, it will survive the winter outdoors provided its pot of soil is well below ice level.

Would you include the blind cave fish in a community tank already housing a population of guppies, barbs, gouramis and characins ?

If you mean *Anoptichthys jordani*, then the answer is yes. *A. jordani* minds its own business and is an excellent scavenger into the bargain. Furthermore it is always on the go.

FISHES OF QUEENSLAND

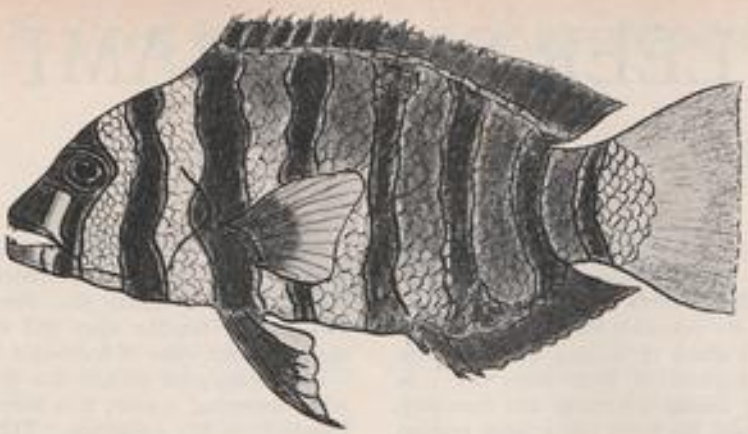
by K. D. Sankey

Illustrated by P. Copeman

The Great Barrier Reef of Australia is the world's largest barrier reef structure spanning more than 1200 miles from Rockhampton in the south, to past Cape York Peninsular in the north, and through into New Guinea. Because of its connection with the Indo Pacific border, most of its fauna is very similar to that found in, and around, Indonesia and New Guinea, although predominantly its fishes are similar to other Pacific fishes. According to Grant there are more than 4,000 species of fishes around the coast of Queensland.

The Great Barrier Reef is very different to any other coral reef that I know. Due to heavy rains from February to May the inner coast remains quite murky from sediment brought down by the creeks from the mountainous Table land areas. On the coast of East Africa the reefs are reasonably close to the shore as there is very little sediment being brought down into the sea but in Queensland, where the water is so murky due to all this sediment, it is impossible for good corals to survive. Therefore, one has to travel perhaps more than 30 miles out to sea before seeing the first coral reef.

In fact, one of the nearest coral islands to Queensland is Green Island, just out from Cairns, which is a well known tourist attraction where people can take out a boat and spend a day, or even a week, on this truly lovely island. There are a variety of things to look at there, including and underwater observatory, which is a large metal box which has been sunk about 10 or 15 ft below the surface and a whole coral reef has been built up around it. Just by walking down into the metal tank and looking through the port-holes in the side one can see an amazing collection of coral fishes. By far the best attraction on Green Island is Marineland Melenasia and one of their exhibits is a shark pool



containing five or six Pelagic sharks of various species, most of which they have kept well on a diet of fishes for a considerable time. The Aquarium is excellent and, at the time I was there, it was managed by Alex Azzopardi and his wife Paddy, two South Africans, who were doing a wonderful job collecting and keeping coral fishes. All the specimens at the aquarium had been collected around the Island. They even showed me *Premnas biaculeatus* (Maroon clown) spawning, which is a coral fish I have never seen spawning elsewhere.

A few miles further out to sea from Green Island one can see the first of the inner reef structures appearing out of the surf at slow tide. The sheer scale of the Barrier Reef is almost terrifying, miles and miles of corals and beautiful coral fishes. In certain areas one can see evidence of the destruction caused by *Acanthaster planci* (Crown of Thorns Star fish). However, although just off Cairns, Alex Azzopardi felt that it was very much a thing of the past and that there were very few *A. planci* to be seen anywhere, and that the damaged sections of reef appeared to be repairing at a remarkably efficient rate. Although the majority of fishes around these reefs are found elsewhere, there are a few notable endemic species that will, in the future, be of great interest to marine aquarists and although at present there are no fishes being exported from Australia to Europe, I do feel that in the not too distant future this will change and every hobbyist will have the chance to keep fishes from the Great Barrier Reef. The fish that will be in treat demand by aquarists all over the world will be *Lienadella fasciatus*, the beautiful Harlequin Tusk fish, a line drawing of which is included in this article. The Tusk fish derives its name from its set of tusk-like teeth, which look almost canine. The coloration of *L. fasciatus* is scarlet vertical stripes on a blue to green background, with crimson caudal fin and primrose pectorial fins. On the reefs they are seen swimming about individually and appear to be scared of very little. They make really tough aquarium specimens and feed well on almost all the usual foods. The major problem is that they are very difficult to find in the smaller sizes, but even so 5 inch specimens would make ideal aquarium inmates. They appear to grow to at least 10 or 12 inches but are at their most colourful stage when they are small.

There are three different butterfly fishes that are common to the Barrier Reef waters, all of which are very beautiful. I am sure every marine aquarist will want to see them. The most spectacular of these in my opinion, is *Chaetodon rainfordi*. This *Chaetodon* can be seen in pairs browsing on the reef in reasonably shallow water. *C. rainfordi* is a yellow colour with five lilac edged orange vertical bars; it appears to grow to about 5 inches, although it is most commonly found at about 2 to 3 inches. More hardy than *C. rainfordi* is *C. flavirostoris*, which is not dissimilar to the Indo Pacific fish *C. vagabundus* in characteristics and mannerisms. Its coloration is striking, with a brilliant orange nose, hence the derivation of its name. My personal favourite is *C. aureofasciatus* which is a heart-shaped butterfly, sulphur yellow in colour with two electric blue vertical bars. These too are found in a very similar way to the aforementioned species and much the same size, perhaps larger. Finally on my short list there is the magnificent *Chaetodontoplus doublayi* (Scribble angel fish); it is rather a rare fish and found mainly in deeper water. It is basically half yellow and half blue with a scribble pattern all over the body.

There are, of course, many other fishes found in the waters of Queensland that are of great interest but these five, I feel, to be the most striking.

References:

Marshall, T.—"Fishes of the Great Barrier Reef."
Grant, A. M.—"Guide to Fishes."

LEER'S GOURAMI

By J. Hems

LEER'S GOURAMI (*Trichogaster leeri*) is one of the most beautifully marked of the anabantids or labyrinth fishes for the basically greenish olive to silvery sides and unpaired fins are adorned with myriad pearly dots overlaid with a sheen of shifting rainbow tints. Ordinarily the underparts of both sexes are pale ivory to white, but during courtship and breeding, the throat of the male, his belly and a large portion of his anal fin become suffused with fiery red. From the mouth, small and pointed, a black stripe passes through the large gold-rimmed eye and extends back to the tail. The margins of this marking are jagged or irregularly serrated. The thread-like ventral fins are white tinged with orange, or red.

The sexes of young fish are not easy to tell apart, but as the species approaches maximum size (about four inches), the dorsal find of the male becomes longer and more pointed than that of the female. Also, the anal fin of the female is not so well-developed or as well-coloured as that of the male.

Leer's gourami seldom breeds until it is about full size. Young may be raised in a tank no larger than 18 in. × 12 in. × 12 in., but a tank twice as long to accommodate without risk of overcrowding the many scores of fry resulting from a spawning is recommended.

The male *T. leeri* with a family in mind expends a great deal of energy in building a nest. This is formed of countless sticky bubbles blown at the surface of the water. All this takes time; and every so often he leaves off his work to seek out and parade before the female. In general, the courtship is not so rough as in related species. But be this as it may, plenty of plant life is advised to afford shelter for a harassed female. Then again, plenty of plants at the surface provides anchorage for the bubble-nest.

When completed the bubble-nest is some four inches across by half-an-inch tall, that is at the highest point of the slightly dome-shaped construction. Exceptionally, nests are much deeper. Although plenty of fry can be, and sometimes are, raised in deep water, best results are obtained in shallow water That is to say, in water not more than eight or nine inches deep. Matured water with a neutral to slightly acid reaction is desirable.

If everything is as it should be, the female takes up a position beneath the nest and permits the male to wrap his body round her's in a loose circle. Concomitant with a tightening of the circle, the female releases some eggs. Immediately the embrace is broken, and the male, and sometimes the female, gulp in the floating eggs and then spit them out again into the mass of bubbles.

Egg-laying goes on like this for an hour or more. After spawning is over, it is advisable to remove the female from the aquarium. The reason is that the male may turn into a dangerous bully. In any case, she needs some peace and quiet to regain her strength. This she would not get in the company of the excited male.

The fry break free from the eggs within a couple of days. That is if the temperature of the water is kept at about 78°F (26°C). But until the fry have absorbed the nourishment contained in their yolk sacs they will remain tied to the nest. Three or four days later, however, the nourishment contained in the yolk sac will be completely absorbed and the nest will start to break up as the fry strike out in every direction in search of food.

There is no immediate hurry to separate the male from his offspring, but this should be done before a month is out. Meanwhile keep him well fed. Microscopic live or prepared food is necessary for the fry. Of live food, freshly cultured non-smelly infusoria is hard to beat. It is best fed to the fry through a slow-running drip tube. Later, such items as micro eels, micro worms or brine shrimps may be placed on the menu.

The surface of the water must be kept clear of any trace of scum and a cover on the aquarium is of the greatest importance to keep out cold air. If well fed, the youngsters should measure between two and three inches before nine months are out.

T. leeri is found in the natural state in Thailand, the Malay Peninsula and Sumatra. It flourishes well in a community tank provided there are no fin-nipping or too boisterous other species present. It has a life-span of upwards of five years and a range of temperature from about 68°F (20°C) to 90°F (32°C). For general maintenance, however, a temperature of 75°F (24°C) is as good as any. The species is not a faddy feeder and will keep in good health on a mixed diet of well-balanced flake food, swallowable live food, and tiny pieces of meat. Besides its popular name of Leer's gourami, it is also known as the pearl gourami or mosaic gourami.

From a Naturalist's Notebook

by Eric Hardy

KEEPING social reptiles, like lizards, in solitary captivity or small numbers makes them lose their hierarchial or social structure by which their behaviour is patterned in the wild, just as keeping solitary, morose chimps and gorillas in zoo cages creates these unnatural inhibitions. You can tell this from the limited "positions" they take up.

Studying the bearded dragon (*Amphiboluras barbatus*), a creature common in Southern Australia, where it is also called Jew Lizard, B. E. Brattstrom of California State College noted some 73 behavioural postures in the field, in outdoor pens and in laboratory vivaria. These positions denote different functions in different circumstances. For instance, the opening of its mouth (showing a yellow and pink contrast colour) he describes as a temperature-control or panting action; but the colour revealed in the gaping may also serve a further signal, for when approached by an enemy it stays still, its scaly dark grey skin merging into its surroundings. If provoked, it drops its throat and erects its back spines, in threat or defence display. It probably also has a social significance or a maintenance function in licking and drinking. Strongly territorial in the field, it becomes loosely hierarchial when crowded in captivity.

Most of us have watched reptile courtship displays, mostly in spring. P. V. Cupp of Clemson University, U.S.A., has watched autumn courtship by the green salamander, in which the male keeps the female in a circling pattern by nudging and biting, and males become aggressive to one another. Where the local fauna is more complex, display, like aggression, becomes more complex because of the greater need for specific recognition, and correspondingly simpler in areas of less varied fauna. Tortoises of both sexes, for instance, develop a butting behaviour.

The vocal range of Mexican leopard-frogs, for instance, covers distress calls, release calls, mating calls and various chuckles, grunts, grinds and low trills. Warning and territorial calls of bullfrogs and natterjack toads are well known.

Not all behaviour is evolved from the pressure and competition of species. American desert and gopher tortoises, and no doubt the common Greek tortoise, avoid falling over steep cliffs by visual response. They have been shown to have no turning bias, and not to respond to blue or red or white patterns marking the cliff. Their avoidance of falling over may be a visual perception of depth in conjunction with the tactile sense of their forelimbs.

It was shown long ago that birds average a slightly larger egg-clutch in higher altitudes, with longer daylight for feeding, than in lower altitudes. Dixon, Lied and Ketchersid have shown this occurs with lizards in Mexico, and presumably elsewhere.

The distribution of Britain's 42 species of woodlice and waterlice is imperfectly known, even though the Press is fond of reporting "shrimps" whenever someone finds a water hog-louse in his tap-water. Formed in 1969, the British Isopoda Study Group, at the Nature Conservancy's Monks Wood Experimental Station, Huntingdon, is now mapping their distribution. They seek records, or specimens, and will act as referee for identifications of these strange crustaceans. The seashore rock-slaters in this group are being recorded by Dr. R. J. Lincoln of the British Museum's crustacea section. The identification key and coloured plates from S. L. Sutton's recent 144-page book on *Woodlice* are now published separately, at 50p. Several new species claimed by Dr. Collinge in the privately-owned, now defunct Northwestern Naturalist were later refuted in the journal of the Zoological Society.

Unable to swim, the climbing water-louse began extending its Lakeland range in Rydal, Esthwaite and Ullswater before the war. It will breed in aquaria, where it is a useful scavanger of debris, and it provides food for fish. However, it eats fish ova and should not be in tanks used for breeding fish.

It was away back in last century when amateur aquarists noticed the common loach's response to thunderstorms and, more so, that of its European relative the giant loach or thunderfish, *Misgurnus fossilis*. The famous African electric cat-fish, *Malapterus electricus* is also known as the raas, or thunderfish. Most fishes turn themselves towards a positive electrode with DC current, and to a negative one with AC current. Even a weak pulsating or intermittent current affects them. Predatory electric eels might use their weaker discharge like radar, to locate prey, for it blends with static lightning.

Work at the Scripps Institute of marine biology in California suggests that weak electricity could give rise to almost a sixth sense in many more fishes than the famous electric catfish and electric eel, which use one or 2 volt discharges. Rommel and McCleave at

the University of Maine claim that migratory eels sense a very weak electrical force and may use this to orientate themselves, for the Gulf Stream has an electric force, like an electrical conductor moving through a magnetic field.

This smacks of the long disproved theory of pigeons homing by reading earth's magnetism. But the Scripps Institute worker suggests that when fish emit electrical pulses as well as sense them, this could be a means of communication. He has shown that a South American electrical fish has sex differences in its electrical discharge rates, and suggests communication as the reason. An adult male changed its steady drone of discharge to a different note when approaching a female. Maybe it is also used for specific recognition where related species live together. Lightning would interfere with this, hence the effect of thunderstorms, when some fish adjust their discharges.

In contrast to the Pacific giant salamander whose prey includes small mammals as well as lizards and other salamanders, even British reptiles eat small fry.

The contents of the alimentary canals of 50 common lizards captured in different habitats in Finland were found to comprise well over a quarter spiders, just over a fifth flies, and 16 per cent bugs, as well as many moths. But their diet varied with season and habitat. Bugs and spiders were the chief food around houses; spiders and flies on stony seashores; spiders and bugs on swamp fields (in both the latter habitats spiders comprised over a third). In damp heath-forest, flies comprised over half, and spiders a little less than a third the diet; but in dry heath-forest, spiders were over a third and ants, etc., increased in volume. Thus spiders and flies were their commonest summer food, while bugs were taken mostly in mid-late summer; then harvest-spiders increased towards the end of summer.

The world's most important nesting beach for the leathery turtle is between the Marowinje River and Organabo Creek, in French West Guiana. Here, large numbers breed with 3 or 4 other species. The leathery turtle has recently been found nesting on the Caribbean coast of Colombia, an extension of its range. Some of the 10 or so breeding females were tagged there and found nesting there again 20 days later. Though leathery turtles stray to Britain, we do not recognise the fictitious claim for one, without proof, at Hilbre, Cheshire, about 1950.

Success is claimed for the pilot hatchery established for loggerhead turtles at Tongaland, with no significant difference in success between untouched wild nests and transplanted nests. Loggerheads take 10-12 years to reach maturity. Since tagging began there in 1963, no cyclic phenomena has been found with the return of nesting females, but it does indicate some territory to which females return after nesting. Sometimes leatherbacks shift the intervals between nesting from 3 years to 2 years.

AN ALTERNATIVE FOOD FOR LIZARDS

By H. G. B. Gilpin

Lizards, in general, provide few maintenance problems but giving them sufficient food in adequate variety does demand some forethought and long-term preparation. Most species will only take living food and it is desirable that this should be presented in as many different forms as possible.

Stick-insects offer a very welcome and readily obtainable addition to the menu. They are clean to handle, occur in a wide enough range of sizes to suit both small and large lizards, and a breeding colony can be maintained year after year with an absolute minimum of attention. Not the least of their virtues is that they will flourish at room temperatures and require no extra heat to stimulate reproduction.

Stick-insects are often ignored when first introduced to a vivarium. They are effectively camouflaged. Their stem-like structure and brown or green coloration, only relieved by small red flashes on the upper parts of the front legs near their point of attachment to the thorax, merge into the background. Also they

tend to remain perfectly still for considerable periods and the lizards fail to see them. They do, however, occasionally scuttle from one place to another and when disturbed, as by the sudden movement of a lizard, although remaining fixed to one spot, weave frantically to and fro so drawing attention to themselves. Once the lizards appreciate that stick insects represent food, and it is not long before they do so, the insects will be eaten freely, their long, succulent bodies providing a rich source of nourishment.

My present colony of stick-insects, now in its seventh year of existence, has provided me with a constant continuity of the creatures and maintained itself without the introduction of any new individuals Reproduction is parthenogenetic. Males occur only at very rare intervals and the females produce eggs, generation after generation, without being fertilised.

The eggs are "fired" with considerable force from the end of the abdomen. They closely resemble small, dark brown radish seeds, each with a yellow spot, and often take several months to hatch. The yellow spot indicates the presence of a "cork" like device which in due course is pushed out, allowing the emergence of a baby stick-insect. No larval stage occurs and the newly-hatched insect is an exact replica of the adult, only differing from its parent in size. When first born its total length equals the diameter of a new penny. After a series of moults it reaches a maximum of approximately four inches. Both young and adults are wingless.

Although the eggs are slow to hatch, reproduction is continuous and once a colony has become established it will at all times contain eggs, young, of a wide range of sizes, and adults. Judicious culling will provide insects for the lizards, keep the numbers in the colony manageable and ensure continuity of supplies.

Stick-insects show no tendency towards cannibalism and considerable numbers can be kept together without harm resulting. The main disadvantage of overcrowding arises when the cage lid is raised in order to replace the leafless twigs with fresh food. At such times there is a possibility that some of the insects will escape. Should they do so, although vegetarians, they will do no harm in the garden, as they will not survive the first spell of cold weather.

Not infrequently the empty exoskeletons of stick-insects, posed in a life-like attitude, will be found. These are not insects which have been brought to a premature end but merely the moulted skins shed at various stages as the insects grow.

Feeding stick-insects involves a minimum of trouble. A colony will survive indefinitely on an unrelieved diet of privet or euonymous leaves. The insects will also eat fuchsia leaves and, with less enthusiasm, ivy. All these plants are readily available in the garden and with the exception of out-door fuchsias, may be obtained throughout every month of the year. I find a bunch of leafy cuttings tightly packed into a small jar of water and stood in the cage will provide my insects with sufficient food for a week. Stick-insects do not appear to drink directly and it is unnecessary to install a vessel of water.

The cage itself is basically a glass fronted wooden box, 14 inches by ten inches by 18 inches high. It stands in a well lighted corner of the room but out of direct sunshine. The sheet of glass forming the front can be slid up and down in grooves cut in the woodwork on either side. It can be removed completely at such times as a thorough cleaning becomes necessary. The closely fitting lid which seals the cage at the top can also be lifted away to give easy access when removing insects or changing the food.

Three one inch diameter holes have been bored in the lid and covered with perforated zinc sheet. These together with six similar holes cut near the bottom of the back of the cage, ensure adequate ventilation.

To further facilitate cleaning operations and the periodic removal of eggs, which for convenience are collected from time to time and stored in a small vessel suspended from the top of the cage, a wooden draw-tray is provided. A false floor, consisting of half inch square wire mesh, is fitted two inches above the surface of the draw-tray. This greatly reduces the possibility of insects escaping during the removal of waste and eggs, as only a few of the smaller ones fall through on to the draw-tray and those that do can easily be picked up and returned to the upper part of the cage.

The provision of a flat piece of wood some two inches by six inches with holes bored in it in which slender well branched twigs can be inserted should be considered. When stood on the mesh floor, it serves as a support from which the growing insects can hang when shedding their skins during a moult.

Noises Fishes Make

by Henry Tegner

FISH ARE NOT generally regarded as being vocal creatures, and yet sometimes they can be quite noisy.

Conger eels will sometimes bark like dogs. I remember on one occasion after bringing a big conger into the boat that it began to protest. The sounds the eel emitted were quite horrible—a sort of snorting and grunting and then a yelp or two.

"He don't make them noises with his mouth," said the fisherman. "They come from his gills. He ain't got no tongue," he added in explanation. Whether in fact the unpleasant sounds this long, slippery fish gave out came from his gills or not I am still not certain, but that a conger eel can be extremely vociferous I am now quite prepared to confirm.

The month was March and the dead rushes, killed by the winter frosts, showed their russet fronds above the water's surface. Suddenly the rushes commenced to rustle, although the day was still with scarcely a breath of wind to ripple the water of Yetholm lake. I thought at first that the sound had been made by some wandering moorhen, but there was no bobbing white stern to be seen, nor the familiar *geck, geck* of a disturbed bird. The vibration of the dead reeds became louder and more persistent. It went on in a slow steady rhythm, and then I saw the fish. There appeared to be scores of them as they slithered in towards the shore amongst the rushes rubbing against one another as they swam. Their slimy, olive-coloured backs broke the surface of the muddied water when they reached the shallows intent on their spawning. The sight of the pike was somehow repulsive. There was something strongly reptilian about the fish. Like little crocodiles, I thought, whilst the sound of the reeds rustling went on all the time—a continuous background monotone to the fishes' creative urge.

The water was low in the pond at the end of the village. The monks were said, in the past, to have used the pond as a stew for keeping carp in. It was a warm summer evening when I strolled down to the water. There had been no rain for nearly three weeks, and the place smelt of rotting vegetation. The midges were a torment, and even continuous pipe-smoking failed to keep them at bay. The evening was still until the sucking sounds began. The fish all started to feed at the same time. The noise made by the carp as they fed was strangely like slow, wet kisses. Carp have flabby lips, soft to get a fish-hook into, as many an unsuccessful angler knows. I wonder whether it was this feature which made the carp such noisy feeders.

After we caught them we put them in an old tin pail. The scratching of the legs and claws of the crabs on the perpendicular walls of the metal bucket made a scratching sound. Having completed our haul I carried the tin pail up across the sand dunes to the car. The crabs began to creak as if they were protesting. It was a strange clamour, and one I had never heard before. It sounded rather like an unoiled door hanging heavy on its hinges in the wind. I tried to determine where the noise emanated from, but when I picked up a crab to discover how it spoke it ceased its din. I suppose the creaking must have come from its feeding orifice, but it was impossible to say for certain. I still do not know how crabs creak.

The weather was really too bright for fishing. The sky was a depthless blue with scarcely a cloud in it. A slight breeze rippled the surface of the little tarn. The quiet of the place was impressive and the noise of the slight wind in the tops of the Scots firs was scarcely audible to human ears. I put my rod together and commenced to cast my flies on the calm water's surface. At the second cast the silence of the day was broken by a delicious *plop*. The little yellow trout came out of the water at the dropper fly. At every other cast the noise was repeated. *Plop, plop, plop*, it was a thrilling sound. Again and again I struck, without success, and then I gave the fish more time so that I hoped they might digest the bait more thoroughly—my tactics were quite unsuccessful, while all the time the *plops* went on.

The memory of that lovely day is mainly of rising fish who, certainly from the trivial creel I made, were in an inquiring rather than a talking mood.

BREEDING THE CONVICT CICHLID

by Jorgan and Pamela Hansen

THE CONVICT CICHLID, *Cichlasoma nigrofasciatum*, is attractive both in its appearance and on account of its strong personality and individualistic behaviour. If, for example, it determines to dig up a plant or move a pile of gravel across the tank, it generally succeeds in doing so.

The convict cichlid comes from Guatemala in Central America, where it is found both in rivers and lakes. Its basic colouring is grey, with 8-9 dark or black perpendicular stripes across the body. Some of the scales on the belly are edged with red, which thus gives the belly as a whole a weak red tinge. The anal and dorsal fins are greenish in colour, and are edged with a red rim 1 mm. broad.

We obtained our first four convict cichlids relatively late in their lives, from some friends who had had them from the age of 2-10 months. When we then took over their care they ranged in size from 7-10 cm. They turned out to be two pairs, of whom the two males, immediately after being placed in their tank, entered into a large battle with the male of our firemouth pair. After this test of strength the tank was clearly divided into three different territories, each pair laying claim to its respective territory.

Besides these cichlids there were seven paradise fish and four rosy barbs in the tank but these mostly confined themselves to the surface.

In the one corner a paradise male regularly built a bubble nest and there mated in turn with various females. Towards the back of the tank sheets of slate standing perpendicularly against the side glass formed cracks and holes in which the fish could hide. The only plants were a very large sword plant (*Echinodorus brevipedicellatus*) and two dwarf sword plants (*E. magdalenesis*); around each plant, covering a radius of about 10 cm. from the root, the gravel was covered with stones of about 4-5 cm. in diameter, which effectively prevented the cichlids from digging up the plants. At the front of the tank various stones lay directly on the tank bottom, with gravel filling in the spaces in between. Here both firemouths and convicts, but particularly the latter, dug holes, often right down to the bottom glass, as part of their preparatory spawning ritual.

The water in the tank was neutral, with a pH of 7, and was Dh 14 in hardness. Each week about 1/5th of the water was removed and fresh water added to dilute the concentration of ammonium hydroxide. The temperature varied between 24° and 26° C (75°-79° F).

After we had had the fish for two weeks, it became clear that at least one of the two pairs, that consisting of the larger male and larger female, were preparing to spawn. We began to feed with fine strips of

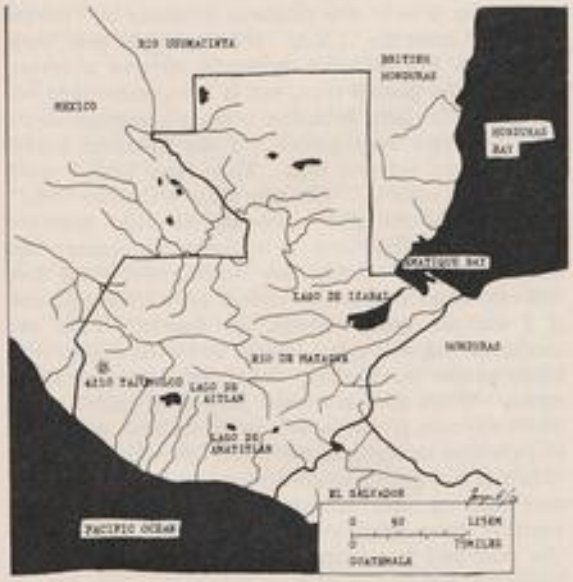
heart of veal, and mosquito *larvae*, while continuing with one daily feed of dry food. Luckily the territory this pair had chosen lay around one of the corners of the front glass, where we could easily observe them. For a week they busied themselves with cleaning this corner area and digging. There was a stone just beside the hole which both male and female participated in digging, but the stone's surface was so rough that we regarded it as unlikely that it would be used as a spawning site. Since we had it in mind to remove at least the first spawning and thus didn't want the eggs to be spawned either on the side or [illegible] glass, we placed in the tank a small (5 × 10 cm.) piece of slate, so that it stood slanting against the side glass just at the edge of the hollow.

Meanwhile the convict pair continued to defend their territory against the other fish, now and then indulging in spectacular battles with the firemouth pair which, however, always withdrew. On the evening of 9.11.72 the breeding-tubes of both male and female became visible. That of the female's was about 3 mm. long and about 2 mm. across at its thickest spot, while the male's was smaller and thinner. They were both white, amost greyish.

On the following afternoon (10.11.72), we discovered that at least 200 eggs had been spawned

on the piece of slate. The eggs were sticky, about 2 mm. in diameter, and pale yellow. At the time we discovered them 15 had already turned white with fungus. The female lay almost horizontally fanning the eggs so that the water around them was constantly renewed.

In the evening we removed the piece of slate, complete with eggs, to the usual 12 litre tank reserved for the purpose of hatching cichlid young. This tank contained fresh clean water, i.e., not water from the parental tank, and was gently aerated. The eggs are not generally affected by being removed from the water during the short time it takes to move then from one tank to another. By this time about 50 eggs had fungussed.



After the removal of their first spawn, the adult pair began immediately to clean a new piece of slate which we had placed in the same spot as before.

11.11.72 we counted about 95 fungussed eggs. Perhaps the eggs were not properly fertilized, as this was the first breeding experience for both fish.

12.11.72. Altogether about 200 eggs had fungussed. We should undoubtedly have removed the fungussed eggs from the beginning, as they seem to have infected neighbouring eggs.

14.11.72 (4th day after spawning). The remaining eggs began to hatch, and the fry gradually fell from the slate to the bottom glass.

15.11.72. 20 healthy fry lay wriggling on the bottom while as many as 310 fungussed eggs could be counted on the slate. Eye pigmentation was slightly developed.

16.11.72. Eye pigmentation was now clearly developed.

18.11.72. The fry wriggled about although not really managing to swim, and ended by hanging at the glass at both sides of the tank.

19.11.72 (9th day after spawning, and 5th day after the hatching of the eggs). The young swam freely and accepted micro-worms and brine shrimp.

Since the spawning we had continued to feed the adult pair generously with heart of veal and mosquito *larvae*. 15 days after the first spawning, on 25.11.72, the female's breeding-tube was again large and swollen and at 6.30 p.m. she began to spawn, without any previous intensive cleaning of the slate, other than an occasional dusting throughout the previous 15 days.

The female swam slowly over the slate and released the eggs in even rows with from 5-15 eggs in each row. Now and then during the spawning she took on a horizontal position. The male did not fertilise the eggs regularly, but now and then dashed quickly over the eggs and back. Otherwise he was strictly occupied in his usual duty of keeping the other fish at bay. The complete spawning lasted an hour, whereupon male and female took turns in guarding the eggs, although the female had longer periods of duty than the male. She circulated the water over the eggs by means of her pectoral fins, whereas the male did not bother with this.

This time we didn't remove the eggs until the evening of the following day, by which time nine eggs had fungussed. We loosened these eggs with a pin and then sucked them up from the bottom with a pipette.

29.11.72 (4th day after spawning). Only 21 eggs in all had fungussed, while all the rest had hatched. Some fry lay on the bottom, while the others still hung on the slate. As the size of the spawning was similar to the previous one it seemed as if we could expect a large brood of convict cichlids.

30.11.72. Eye pigmention developed.

3.12.72. Some of the fry began to swim in small jumps although many were still hanging.

4.12.72. All the young swam freely, and were fed with brine shrimp and micro-worms.

The second brood thus developed at the same rate as the first.

We removed the brood to a 48 litre all-glass tank, which however was only half-filled and which contained fresh tap water. The fry's previous tank was submerged into the water so that the fry could themselves swim out into the larger tank.

On 13.12.72 there was a new spawning on a new piece of slate. We didn't observe the spawning, but noticed the eggs at 3 p.m. at which point there were about eight fungussed eggs. Both male and female were guarding the eggs.

14.12.72. Some of the fungussed eggs had been removed, together with those immediately next to

Continued on page 187

OUR READERS WRITE

V.A.T.

G. F. Riley, writes in the June edition of the *Aquarist* about a possible "cashing in" on Value added Tax by a certain company. I have no idea to which company he is referring, but I believe that he, along with many other people, is confused by the application of V.A.T.

Admittedly, if a customer's order was delayed until after April 1st he would be liable to pay tax, but none of this would go into the trader's pocket. The whole 10 per cent goes to the Inland Revenue, because that trader must pay the 10 per cent collected from his customers at the end of every quarter year. So no matter what price is charged for an article, be it 10p or £100, if it is paid for after April 1st, 1973, 10 per cent is payable in tax and there is no way a trader may avoid this.

Equally, some people think that goods in stock before April 1st will yield to the retailer some of the V.A.T. because he has not had to pay V.A.T. to his supplier. But the same law, and it is law, applies; the 10 per cent paid on that article by the purchaser is collected every quarter by the Inland Revenue.

Yours faithfully,
G. J. Bicker.

Fish Foods

At the recent Pet Trade Fair in Harrogate I came across one dealer distributing a new form of freeze dried food manufactured in Japan. A piece was place on the surface of the water and it swelled up looking, for all the world, like a piece of bread. I asked the stand attendant for an analysis of the contents and found that it contained around 20 per cent protein and 50 per cent sugar. Surely we are interested in high protein foods and sugar should be avoided as it provides and ideal medium for bacteria.

This was only one of many products which I classified as gimmicky. The markets are being flooded with such rubbish and it is difficult for dealers to get the best for his customer. I think that a halt should be called in the aquatic industry as the advances are being made in the wrong direction.

G. B. Robertson,
7, Aspin View,
Knaresborough,
Yorkshire.

CATFISH

In answer to B. B. Smith's and W. F. Clarke's letters on coldwater Catfishes, I think both have some of the truths but not all.

I have kept a Cat for 5 years now and it has grown from 1in. to 9½in. in that time due mainly to eating live foods such as golden orfe, bitterling, fantails, black moors, another smaller Cat, and common goldfish.

Originally the Cat was housed in a 36in. × 15in. × 12in. community tank and on attaining about 4in. he devoured a fish a night for about a week. He was then removed and only replaced when he had fish of the same size with him. This did not deter him and he devoured a few more until he was removed to his present house a 24in. × 15in. × 12in. tank.

The Cat I have is a *Ictalarus nebulosus* or "brown bullhead" from the U.S.A. It can grow to 16in. long in aquaria but will not normally survive a severe winter in the garden pool, nor is it recommended for the pool. It quite definitely is not a scavenger as its tank gets dirty very quickly. I use an under gravel filter and an external one. They have been known to breed in aquaria. The pair build a shallow "nest" in the gravel and after spawning the male cares for the eggs and fry, so it is advisable to remove the female. I feed tubifex, raw meats, and young live bearers, and occasionally cheese or boiled egg, and if I am not quick enough my fingers. They are territorial fish and this I believe to be the reason why some people successfully keep them in community tanks. When they are small they need only a small territory, and if the tank is well stocked, growth is impeded, so the fish will just chase fish off his territory. When it has grown to about 4in. the area has grown and fighting and subsequent losses will start. I recently have tried two 4in. pugnacious perch in the tank and lost both on their first night, but not eaten just killed.

The other coldwater Cat *Ictalurus melas* is also from the U.S.A. but is now found in European rivers and I believe in S.E. England. This could be the fish Mr. Smith has as it is less aggressive and lives on fauna and insects. As the difference between these two fish in appearance is not readily apparent I would suggest it is not worth taking a risk and introducing coldwater Catfish to a community tank.

R. Bailey,
Birch Green,
Skelmersdale,
Lancs.

Collecting Marine Specimens

I am not often moved to write to Editors, preferring to leave this task to those more eloquent; however, I cannot resist the temptation to add a rejoiner to Mr. R. T. Witham's letter in the May issue.

I am not sure that Aquarists can afford to be so short sighted as to want to get their live stock a few pence cheaper at the risk of destroying the very environment from which their future specimens would be collected. I know that Richard Sankey, along with others, feels very strongly on this point and has even gone to the trouble and expense of supervising the catching of specimens. However, he only represents one Wholesaler. How do others feel about this matter?

I do hope that you find space to print this letter, if only to assure Mr. Witham that he is not one voice in the wilderness—even if it may upset your pet expert.

Yours sincerely,
David G. Hammerson.

Continued from page 185

them, perhaps because these were also infected, or perhaps because it wasn't easy for the fish to remove a single fungussed egg without touching those near it.

17.12.72. All the eggs hatched out, and the fry lay on the bottom while the female hovered over them, and the male kept guard.

18.12.72. The fry had disappeared but the parents still kept their territory and cleaned their hollow.

25.12.72. The fish had given up their hollow and took it more lightly if other fish intruded upon their territory.

29.12.72. We moved the fry from the second brood to a 98 litre tank, and found that they numbered 255. At an age of 25 days (counted from the date they became free swimming) they were 10 mm. in size, whereas the young from the first brood, which were then 40 days old, had attained a size of 20 mm.

As most aquarists know, the development of the embryo takes place at a varying rate which increases with ascending temperature. Each species has, moreover, a basic rate of development peculiar to the species, and this is expressed by the constant K, which we can find by following the formula $K = Dxd$, i.e., multiplying the number of days the full development takes by the number of centigrade degrees prevailing. Alternatively, if one knows the constant K for the species in question one can then work out the number of days development will take according to the prevailing temperature.

From our two spawnings of the convict cichlid we could thus work out the appropriate constant as being 9 (days) × 26 (°C) = 234° day degrees. If this is correct, one could then assume that if the temperature had been for example 20°C development would have taken $\frac{K}{d}$ days $= \frac{234}{20} = 11,7$ days.

Our results are not exact as temperature can swing a degree or two in the course of the day, and moreover the exact time of spawning and the exact time when the young became free-swimming should be noted. If with brood 2 we maintain that the spawning took place at 6.30 p.m. on 25.11 and that the young swam freely on the morning of 4.12 then the figure becomes $8\frac{1}{2}$ instead of 9 days. Our calculations would then lead us to: $K = 8\frac{1}{2} \times 26 = 221$ day degrees. And at 20°C: $D = \frac{221}{20} = 11,05$ days, which is not too big a swing from our previous result.

The World's First CRAB DERBY

The Mid-Sussex A. S. pride themselves on being forward thinking and full of bright ideas. For some years now they have held an annual Fish Exhibition in which members display their hobby to the general public on a non-competitive basis. Chairman of the M.S.A.S. Mr. Robin Johnson maintains "that this event does more to encourage interest in our hobby than all the Open Shows put together." An exaggerated claim you may think but there is more than a grain of truth in it. This year nearly 2,500 members of the public visited the Park Centre, Burgess Hill on Sunday 27th May to see a wide range of aquarium displays.

Support for this venture was so encouraging that the Exhibition manager Mr. D. Soper looks forward to a two day exhibition next year. He says "The hall is already booked for Bank Holiday Sunday and Monday —all we have to do now is put on a bigger and better display if that's possible."

The main item at this year's exhibition was of course the introduction of the world's first CRAB DERBY which attracted a great deal of publicity from not only the local but also the national press. Perhaps the major publicity was when the crabs appeared on BLUE PETER, this preview event was won by Puddle Jumper scuttling down the 1600mm course cheered on by the Blue Peter team. In the main event of the day the tables were turned when Sidewalk won the first ever WORLD CHAMPIONSHIP in 20 secs flat. His trainer Jim Burtles said "this was not a particularly fast race, more tactics than a flat out sprint. He has beaten 12 secs in training.

Crab racing is likely to become quite a popular event as the Mid-Sussex stable have already received quite a number of invitations to appear at various functions up and down the country. For the technically minded the crabs used are common Shore crabs (*Carcina maenas*) fed on a diet of raw oxheart and prawns. The next world championship is scheduled to take place next year over the Spring Bank Holiday and is open to anyone bringing their own crab.

MARINE QUERIES

by Graham F. Cox

QUERY FROM A READER IN MALTA——

For some years now I have been working in Malta and, being a keen marine aquarist, I decided to undertake a little marine aquarium research of my own.

I have been running experiments to determine the relative merits of the Natural System as opposed to the Semi-Natural System of marine-life culture. I set up two identical tanks and stocked them identically. Both tanks were heavily planted with *Poseidonia oceanica, Caulerpa, Zostera, Ulva, Halimeda, Udotes* and *Codium* spp. The animal life thrived equally well in both tanks and so I tended to compare plant growth. I used artificial light only and your formula Algal Fertilizer. All the plants showed a spectacular growth increase after using the fertilizer.

Question (1).—Can I safely increase the dosage of your fertilizer?

Throughout the 22 weeks of the experiment the pH of both tanks remained at 8.3 and the nitrite content remained at zero. Previously in my Semi-Natural systems the pH has slowly sunk over this period to pH 7.5 to pH 7.8.

Question (2).—Do you think that the algaes in the heavily planted tanks could be responsible for maintaining my pH?

Although the *Poseidonia* growth showed little difference between the two tanks, growth of the other species differed widely. In the Natural system all the plants except the *Poseidonia* and *Caulerpa* spp. eventually died, but only two (2) plants were lost in the Semi-Natural system.

Question (3).—Why did the plants begin by growing fairly well in the Natural system aquarium, but always eventually die off, whereas those in the Semi-natural system remained strong and grew well?

As a result of this difference between the two tanks, I developed the idea that the Semi-natural system's U/G filter was producing more nitrate salts for the algaes. However, a nitrate test revealed that neither tank contained a significant nitrate content.

Question (4).—Are the plants using up the nitrate as fast as it is produced?

As a final experiment, I decided to pollute both tanks deliberately and measure the nitrite decrease in each one. I added sufficient fouled seawater to give a nitrite reading of 15 p.p.m. in both tanks and recorded the nitrite reading in each tank every 24 hours. After 5 days the reading was zero in both tanks, the rate of decrease being identical.

Question (5).—Does this indicate that the nitrification potential of a Natural biosystem is equal to that of a Semi-natural biosystem?

(1) You can quite safely (as far as fishes and invertebrates are concerned) increase the algal fertilizer dosage to *four* (4) times that stated on the package. The only thing to suffer would be the alkali reserve of your seawater. This would tend to diminish rather more quickly than normal, perhaps necessitating more frequent partial water changes. However this tendency should be largely counteracted by the plant's photosynthetic activity (see (2) below).

(2) Yes, I would expect a rapid-growing algal population to stabilize your seawater's pH. The reason for this is (chemically) quite simple to understand. The rapidly photo-synthesising plants deplete the system's available carbon dioxide which would otherwise precipitate out base metallic ions like calcium and magnesium—both of which are necessary to maintain the alkaline pH.

(3) The reasons for the early decline of plant life in your "natural system" tanks were probably:—

(a) Owing to the very poor nitrification potential of such a system you were possibly loath to stock the aquarium with as much animal life as you would have liked. This in turn would have led to a low content of nitrogenous and phosphate fertilizer in the sea water. My formula algal fertilizer is formulated on the assumption of a stocking ratio of 1in. of animal life to every 2 gallons of water—quite an acceptable maximum stocking with the assisted natural system using heavy U/G filtration.

(b) In addition this low animal stocking level and the absence of the massive populations of nitrifying bacteria present in a gravel filter bed would lead to a low level of carbon dioxide production (*Nitrosomonas* spp. and *Nitrobacter* spp. produce substantial quantities of CO_2 as

a result of their normal respiratory anabolism).

(4) Yes, nitrate depletion is quite normal in marine aquaria which house rapidly-growing plants. Nitrate salts are removed from seawater to provide the first "building blocks" in the synthesis of plant proteins.

(5) Your results obtained by polluting the Natural System (or Semi-natural System) are interesting. However, 15 p.p.m. as nitrite is not a very great level of pollution and is commonly met with during the normal maturation period in a semi-natural biosystem. If, however, you had polluted the aquarium to the stage where the nitrite test sample had immediately turned brilliant red and seconds afterwards produced an orange precipitate (nitrite level = 30+ p.p.m. as nitrite), I'm sure you would have seen a spectacular difference between the two systems.

I would like to add here that more details concerning the precise efficiency of your semi-natural system would have been welcome. By this I refer to the fact that you haven't given details of the *Turnover Rate* of your U/G filter (i.e. the number of times in each hour that *all the water* in your biosystem passes through the filter bed); the *depth* of the filter-bed itself, (i.e. How much gravel are you using?); and the precise chemical nature of your filtrant medium (i.e. is it silica, calcareous gravel/sand or a mixture of both?). All these factors (*and others*) affect the nitrification potential of a marine U/G filter. In other words, if you've got everything wrong, i.e. a *freshwater* U/G filter having "blind-spots" and wholly inadequate air lifts, a weak airpump, and only ½in. of gravel or so, then it is more than probable that your so-called semi-natural system is no more efficient than the natural system unit you are comparing it with.

THE DWARF SWORD PLANT

by Jorgan & Pamela Hansen

"A SWORD PLANT is a sword plant," one often hears aquarists say, and as such, it is implied, is suitable only as a background plant in a large tank. Forgotten are all the small *Echinodorus* species which can be used either as foreground plants in larger tanks or as background plants in smaller tanks with a height of 20-30 cm (8-12 ins.). Even if the aquarist is aware of the existence of these smaller sword plants, he is often induced to buy young specimens of a potentially large, unnamed sword plant, which he cannot distinguish from the dwarf sword plants he has in mind.

Echinodorus magdalenensis, mistakenly called the *Dwarf Amazon Sword Plant*, although it is not found in the Amazon or its tributories (but in the Rio Magdalena in Colombia and in the near-lying coastal areas), is one of these species which, with its maximum height of 20 cm (8 ins.), excels itself as a foreground plant. It was described relatively late, in 1955, by Fassett, who, however, did not know the submerged form of his new species, as it can only be identified by the flower, and the submerged form was never observed to flower. It is often referred to as *E. intermedius*, in the same way as lesser known species of *Echinodorus* are often referred to as *magdalenensis*.

The plant is perennial and has a short rhizome from which the leaf-stalks sit in rosette form. The leaf-stalks are triangular in cross-section and grow to a length of from 5-10 cm (2-4 ins.). The lancet-formed leaf grows to a length of from 4-15 cm (1½-6 ins.), with a breadth of from 1-4 cm (½-1½ ins.). New leaves are light green, with the veins more darkly coloured. Older leaves are dark green, and the veins are thus harder to distinguish. A central vein and two further veins run lengthwise, while there are many small cross-veins.

If the plant grows under marsh conditions, that is, with leaves above the water-level, the leaves will grow to a smaller size, from 3-5 cm (1-2 ins.), and ½-1 cm in breadth. We have had the plant growing in a tank with a water-level of 5 cm (2 ins.), which resulted in a pretty little plant with much stiffer leaves than in the submerged form. Later, when the tank was filled, the plant developed the larger leaves typical of the submerged form.

E. magdalenensis is not difficult to propagate. Flower stems develop regularly which, with adequate sunlight, will rise above the water and develop small white flowers which have a lovely scent. One summer one of our *magdalenensis* plants flowered, and we much regret that we were unable to photograph the event, since as before mentioned flowering has not previously been observed in the submerged form. The plant at that time received 12 hours of ordinary daylight, and beside this at least 2-3 hours of direct sunlight, every day. There was no top glass on the tank, and the flower stalk thus had plenty of space above the surface of the water. We never saw any seeds, but

there later developed young plants at the base of the original flower-stalk.

With a lesser amount of light the plant will still develop a flower-stem which will, however, remain under water and, instead of flowers, will produce shoots at the nodes, each node being surrounded by three small leaves (lobes). Roots also developed at the nodes along with the shoots; sometimes roots alone developed, but never shoots without roots.

One year during the months May to July each of our specimens produced two flower-stems, one immediately after the other, and this has happened several times since, under circumstances which indicate that if a flower-stem for one reason or another is hindered in its development, the plant will immediately develop a new flower-stem.

The distance from the first node to the rosette of leaves was with our specimens 20 cm (8 ins.), and thereafter the distance between each node was 5-10 cm (2-4 ins.). All in all 12 nodes developed on each stem, which together with the top shoot gave an approximate length of 80 cm (32 ins.) to the submerged flower-stem. At the moment we have a plant with a stem over a metre long. It takes at least

5 weeks for the flower-stem to develop, and it takes a further few weeks before one can remove the young plants.

When the roots of the young plants have reached a length of from 1-2 cm, the flower stem can be weighed down to the bottom with the help of a few pebbles, and one can then sever the connection between the flower stem and the mother plant, so that its energy is not exhausted in nourishing the young plants which, in our experience, can number up to 18. When the roots have attached themselves firmly to the bottom and the plants have attained a reasonable size (5-10 cm, 2-4 ins.), they can then be cut away from the stem.

Shoots do not always develop at each node, which might be due to inadequate light, but there can be from 1-3 shoots from each node that does sprout. The stem should not be thrown out after the young plants have been removed, as new shoots often appear if the stem is allowed to float on the surface for a week or two. New shoots generally occur at those nodes where shoots did not previously develop.

We have twice observed division of the rhizome, or underground stem, which resulted in leaves being produced both at the base of the original plant, and from the newly-formed plant. When the new plant is large enough, that is, has about 5-6 leaves, one can carefully divide the two plants whose roots will be considerably entangled.

E. magdalenensis is one of the 30 species of *Echinodorus*, 26 of which are to be found in South America. It grows well in rough gravel, in neutral water with Dh 14. If withered and partially withered leaves are continually removed, an increased production of new leaves will result.

NATURAL?

Can we have a Balanced Aquarium?

Is it a wise Danio that knows its Father?

asks

John A. Stapleton

SOMEONE once told me that they kept an aquarium, because they wanted "a little bit of nature in their living room—a natural situation they could study." Of course they were right about the little bit of nature in their living rooms, but then they have several little bits of nature—the flowers in a vase, coal burning in the fire—but just how *natural* can an aquarium be? The more we come to think about it, the less natural an aquarium is. At this point I'd like to state I'm not concerned here with those aquariums so blatantly unnatural as to have purple-spotted gravel, everlasting plastic plants and a porcelain mermaid reclining against a turning water-wheel. Anyway, the people who think that this is the epitomy of an aquarium, don't read this magazine! Here I am concerned with the serious attempt to grow plants and maintain a reasonable selection of fish in what has, unfortunately, become known as a "balanced" aquarium. Surely, the mere fact that we have to feed our fish means that there is no such balance. We certainly try to simulate nature in our fish-tanks, but where the rules of nature won't apply, we have distorted and bent them rather drastically.

Let's consider the constitution of an average aquarium step by step. First of all the tank itself; the lakes and rivers don't have glass sides letting in the light—the source is only from above. The water we use is invariably that from the tap, and even when aged is still not of the same chemical constituents as all those different rivers our diverse selection of fish once originated from. The fish survive, though, because the dealer had them in the same water, and besides, how many of our fish have ever seen the wild anyway? The plants are usually a selection drawn from all over the world, suddenly all placed together in a small area of water, where they are expected to grow happily. Then the fish themselves, originating from innumerable countries, are expected to function in a happy community. How we can expect this I don't know, when we consider that *we* can't exist happily when our different races are mixed, and *we're* not so very different from each other anyway. Fish, however, are much more varied. They differ greatly in size and temperament. They are more territorial than we are, and are more overcrowded too, but they are still expected to live happily together, and sometimes they do because we have distorted nature.

A great deal of our fish are as domesticated as our cats that respond more to the sound of a tin-opener, than to the sound of a mouse scurrying. Angel fish, for instance, were considered very difficult to keep and impossible to breed when they were first introduced

but now a great number of us have experienced our angels spawning in the mixed aquarium. This is because our angels have never seen the wild, nor have their parents, or their parents before them, and so on. They are probably very similar genetically too, which accounts for there being strong fish and runts in every batch of youngsters. The family of Cichlids, of which angels are a member, in the wild need a considerable area in which to breed. They stake their claims until all the neighbouring fish know that if they go within certain limits they'll have a very unangellic angelfish flying at them. This territory is usually big enough to support both the parents and the youngsters with food. Now, so as not to get a proliferation of angelfish, or of *festivum* cichlids, or a predominance of any one type of fish, it is necessary that only one pair of youngsters from every pair of parents will survive through to successful breeding. The other babies die, get eaten, fail to breed at all, or some other misfortune befalls them, or they fail to stake out their territories, and their brood gets eaten by predators. This last unsuccessful pair, however, are the ones that are important to the aquarist. Out of, say, six pairs of imported wild cichlids, maybe only the one pair will be induced to spawn in the aquarium. The others won't spawn because there is not enough room to stake their territories. Whereas the youngsters of our pair that has bred would soon be eaten in the wild, we take them and artificially rear them.

This lot of babies would probably grow up, forced on with high temperatures and luxury foods, and they would feel a little happier about breeding in our tanks, because all they would know of the wild is what Mum and Dad told them about it. What is happening here though, is that brother and sister are being bred, and although the ensuing babies would be perfectly healthy, they are all developing common genes. This means that the ones that get to the food first on the first day, stay in the lead, and increase that lead from then on. Those that were last to the first food however, will always be last, dropping further and further behind all the time. If the babies were of differing genes, then maybe one fish would see the food first, another would smell it first, another would not have seen it or smelt it until after the others, but could swim faster, and another, a bit rough on all these points, might have bigger muscles to push it's way to the front.

One consolatory point for those fish that fall back and become the runts, is that they often turn out to be the best breeders. Those that have shot forward reach the senility stage too quickly, and often prove to be infertile, whereas those that take their time growing up, don't fly through their "perfect" stage so quickly. The "perfect" stage of a fish is when it has stopped thinking about growing, and is at it's most efficient period, when it knows enough about living, surviving and feeding to be able to think about sex too. After that it has reached its peak, and senility is the next and last stage of the fish's development.

Guppies are an old-time favourite, but are they natural? Like our angels, they have become domesticated, bred and bred and bred to produce those flamboyant tails, and even quite colourful females. There are only two types of angelfish, *Pterophyllum scalare* and *P. eimeeki*, from which the silver, lace, black, marbled, golden and blushing angel have been developed, and also the de-luxe models of these forms, with veil fins. Similarly the guppies, delta, de Gaul, snakeskin or what-have-you, come from a comparatively drab, *Lebistes reticulatus*. Take a collection of wild guppies, males and females, and you will find the larger silver females chased by several males. When you put your hand in the tank, or disturb them in some way, the females dart for cover, and the little males are left fluttering around. In the wild they act as decoys to distract predators from the female, that is why the females are inconspicuously silver. Apart from the indirect form of feeding through being constantly injected with the males' sperm, why else does the female constantly need males around her? After all, she can store the sperm of the male to fertilize up to twelve broods of youngsters, so is in effect, a bisexual organism. The males are decoys, and thus the most-efficient decoy, leading the predator away from the female, is the male whose babies will be born. Our domesticated females, however, don't fly for cover when alarmed, they've forgotten what fighting for survival means, and our fancy males would do an admirable job at fluttering distraction in the face of the enemy, but also down the enemy's throat, because they are hardly efficient swimmers, with a tail developed four times as large, but still with the same muscles to control it.

So then, the baby livebearers come along, and we take them away from the parents because they have that annoying habit of eating their young. Why is this? Because they have too many babies?

This hardly seems a rational explanation. Surely if this were so, then nature would adapt with smaller broods. More to the point is that the babies form one step up in the food ladder. The babies filter-feed off the unicellular *algae*, and the micro-foods that the parents are unable to extract from the water; therefore, by eating some of their young, the parents are able to obtain some of these foods and more energy is received by eating their babies than is lost having them. This doesn't happen in our aquariums does it? Besides, they don't need to fight for food, do they?

Our aquarium fish have almost forgotten all the important factors that go with breeding in the wild. As already mentioned, our successful cichlids in the

tank would be the unsuccessful ones in the wild. An important factor for breeding is the seasonal rhythm. Often this is quite simple for the fish as it may be the time that the eggs take to develop but if not, the fish then rely on day-length—not the quality of the light, as water plays such funny tricks with light, but the duration. However, our unnatural little fishes still spawn for us despite all the constants we give them—constant light tea-time till bed-time, and constant temperatures, too. Temperature is another vital stimulus in the wild, along with the changes in water chemistry. The fish take a note of the day to night temperature fluctuations, and also the temperature and chemistry changes caused by the rainy seasons. The rains come, throwing cooler, slightly acid, soft water into the rivers and lakes, washing leaves, humus and assorted debris into the water. The fish then know it is time to spawn as the decaying vegetation also induces insects to lay their eggs, too. Perfectly timed, the fishes' young will coincide with the insect *larvae*, and there will be food all round. Too early, and the babies will starve before the food comes; too late, and the food will be already gone. Some indication that all is not forgotten in our aquariums is when our fish suddenly spawn after a partial water-change, or after we've thrown in assorted goodies in the hope that we might have hit upon the right delicacy to induce spawning!

Even at it's "perfect" stage, a fish in the wild is often found to be carrying a third of it's own weight in parasites, but still it functions efficiently. The parasites are quite naturally living on the fish which can cope with them, until something disturbs them, and there is an epidemic of one particular type of parasite. If you think about it, a wild fish *must* come to terms with parasites as it has so much of its body vulnerable. With land animals a parasite can only be "acquired" by direct contact with it, or by eating it. A fish living in water, however, is always open to parasites which are carried by the water. A fish has such a large area of finnage and body surface just right for a hungry parasite, and also the fish is constantly passing water over it's gill-plates. The parasite happily burrows itself into the skin of the fish and feeds away, doing no harm to the host as the tissue of a fish can completely regenerate in 24 hours. However, if something disturbs that parasite and causes it to reproduce, then the fish cannot cope with this unbalanced state. A few other fish in the neighbourhood may also succumb to this infection, but a whole community will not necessarily be infected because the area of water they are living in is very large. Now, admittedly our home-bred fish in our aquariums don't house the dozen or so different parasites a wild fish will, but if an epidemic does occur (and it only takes the abrasion of a net to cause a happily feeding *ichthyophthirius* (white spot) parasite to think about dividing) then the whole tankful falls down because the fish are so jammed-packed together.

This article is not intended to dishearten anyone who thought he was housing a natural phenomenon, or to knock in anyway the hobby. I think it is interesting just to compare our tanks with the wild state. Often, of course, things differ from the wild because it is all a matter of practicality and convenience. For instance, ten-inch mollies can easily be fished out of the Everglades, but we can't really accommodate such monsters, therefore we have bred them smaller and smaller. This is understandable. What I can't understand is a situation such as I've seen where red-tailed black sharks are swimming upside down, feeding off the surface because their tank is too clean and too crowded for them to be sustained as bottom feeders. I have also seen a tank heavily planted with *cabomba*, full of angels, whereas it doesn't take too much to realise that angels are striped and laterally compressed to camouflage and travel amongst tall reed-like plants, such as *Echinodorus* species and *Vallisneria*.

Dealers often wonder why their fishes look frightened and pale. One important reason, apart from hob-nailed boots and kids tapping the glass, is that they are psychologically upset because the tank is bare, or recently planted. If we were put in a square room with all the walls the same, and no furniture, we would feel disconcerted too. The fish feel vulnerable with glass walls on every side of them, but more important is that they must have a rock to navigate by, or they just don't quite know where they are. Plants don't help the fish to navigate—admittedly they offer the security of shelter—but the fish just don't trust them to get their bearings by and rightly so as the plants are always different, green one day, brown the next, floating up and away and changing shape with growing.

Something I always find interesting when catching fish for someone, when helping in a shop is the statement that is always common: "Oh well, I suppose the fish can tell." This usually comes after I've said that I can't sex a pair of fish for them as there are no superficial sex differences between male and female. Who says they can tell? Who says they must have monogamous relationships such as we do? Some fish do, of course, but fish like the danios, for instance, swim in huge shoals of males and females. The females scatter their eggs and the male distributes his sperm. There is no direct male/female relationship. The male doesn't know which female's eggs he has fertilized, and he couldn't care less. We are trying to impose our ideals on the lives of the fish when we place a single male with one female—and when we come to think of it—what, in our society, is natural either?

Junior Aquarist

THE HARDY EUROPEAN REPTILES AND AMPHIBIANS IN CAPTIVITY (Part 15)

by Andrew Allen

32. The European Pond Tortoise (*Emys orbicularis*)

Description.—This aquatic tortoise may grow up to 36 cms. in the South of its range. The carapace and plastron are joined only by a cartilaginous septum, and the pastron itself consists of two mobile plates. The toes are webbed, and the tail long. The carapace is dark brown or black with yellow spots or fine radiating stripes, while the plastron is greyish-yellow splashed with brown.

Distribution.—The Pond Tortoise is to be found almost throughout Southern Europe, and in much of North Africa and Western Asia. Northwards it extends at low density into Central France, North Germany, Poland and Lithuania. It used even to inhabit Southern England, but attempts to reintroduce it have largely failed. As its name implies it favours ponds, preferably muddy, and also lakes, ditches and slow-running streams, sunning on their banks and hibernating in their depths.

Breeding Habits.—Courtship takes place in the water, the male swimming around the female, biting and nudging her. Mating also occurs in the water. Up to fifteen eggs are laid in a small hole dug in soft, damp soil on the land.

Care in Captivity.—Treatment of the adult animals is fairly straightforward, but this is emphatically not the case with the baby Pond Tortoises that are so frequently to be seen in pet stores. They are far from hardy, and require similar care to the tiny North American Painted and Elegant Terrapins. Their purchase should be avoided unless much time can be devoted to their welfare. An admirable article upon the treatment of these delicate creatures appeared recently in this journal ("The Care of Baby Terrapins" by Stephanie J. Peaker, *The Aquarist*, February, 1973).

The adults may be kept indoors, assuming that a sufficiently large aquarium can be provided. Six foot would be an unsatisfactory minimum length for an aquarium intended to house a pair of specimens. It should be divided equally between land and water areas. Ideally the water should be both deep and muddy, however the amateur may find it more convenient, hygienic, and aesthetically pleasing to have a gravel substratum and maintain the water in crystal clear condition by means of sturdy filters. Aquatic plants tend to be rather superfluous, having a rough time at the claws of these boisterous and robust creatures. The terrestrial half should contain a few large shelters and possibly some decorative pots of resilient plants. The vivarium should be located so that part of it is in the sun, and supplementary heat and light are also desirable.

The Pond Tortoise is hardy enough to make a perfect inmate of an outdoor reptiliary. This need only have low walls (about a foot would do), but should contain a very large and deep pond. One of the easiest ways to create such a basic arrangement is merely to surround a pre-existing garden pool with a simple stone wall or low, stout fence. If the pond is sufficiently deep and has a good layer of mud or rotting leaves, the Pond Tortioses will hibernate very satisfactorily of their own accord. Otherwise they should be placed at the onset of Winter into a sturdy, escape-proof wooden box packed with dry leaves and straw. This should be transferred to a cool, frost-proof outhouse, and inspected at regular intervals. In the Spring the tortoises must only be returned to the reptiliary when temperatures in the outhouse and the garden are identical.

This species would probably prosper in a well planned greenhouse, though I have never personally attempted to so house them. The atmosphere would have to be kept dry by means of ample ventilation.

They are voracious feeders whose tastes are readily

satisfied. Food is generally dealt with in the water often being ripped to pieces by the sharp claws. Earthworms provide a useful basis for the menu, and can be supplemented by woodlice, snails, pond snails, mealworms, gentles, gnat larvae, slugs, beetles and whole range of aquatic invertebrates. Raw red meat and liver are a good reserve for times of shortage, but should not be used regularly. Small fish, newts and frogs will be attacked and eaten with equal eagerness. Though Pond Tortoises are savage and ferocious aquatic predators they will also take a variety of vegetable fare, and a certain amount of greenstuff is essential to their total good health. They will nibble at a range of coldwater plants, gulp down Duckweed (*Lemna sps.*) with gusto, and may sometimes enjoy a leaf of watercress or lettuce. These animals are very messy eaters, and the remains of their meals will soon contaminate a small pond, providing ideal conditions for disease to take hold. Ideally some form of filtration should be used to combat this, or the environment could be kept fresh by means of frequent changes of water.

From these comments it should be obvious that Pond Tortoises will not fit harmoniously into the majority of communities. They must be kept well away from all frogs, toads, newts and small lizards. Possible companions are Caspian and Spanish terrapins, Green and Eyed lizards, and Grass, Dice or Viperine snakes. Land tortoises are thoroughly compatible, but are probably not accomplished enough swimmers to be trusted in the vicinity of a deep pond.

Emys orbicularis is a particularly interesting and entertaining species. If treated well it is capable of living to a ripe old age and becoming extremely tame. It can be difficult if it is not given sufficient space or an adequately varied diet, but then this applies to all reptiles. It is also imperative to purchase healthy specimens to start with, for terrapins of all kinds are susceptible to a number of diseases that can rapidly infect an entire stock. The introduction of one ailing individual to a previously thriving group can have disastrous effects. Once some form of ailment takes a hold it can be almost impossible to eradicate, especially in a large outdoor pool. So check all new acquisitions with considerable diligence, and preferably place them in quarantine for a few days for close observation. These precautions are thoroughly worth while. Having sounded this warning, let me stress that these animals will be an unfailing source of enjoyment to their owners, and a fascinating object of scientific study thanks to their intelligence and great vivacity.

There are no sub-species.

33. The Spanish Terrapin (*Clemmys caspica leprosa*)

Description.—The Spanish terrapin grows up to 26 cms. in length. It has a low domed carapace that is rigidly fixed to the plastron by bony plates. There are five claws on the fore-limbs and four claws on the hind-limbs, with thick webbing between the toes. The carapace is a light yellow-brown that darkens to olive-brown with the passage of time. Red or orange patches occur centrally on the shields. The plastron is yellow, while the skin is olive spotted with red or orange. There is a ring about each ear and a dot behind each eye.

Distribution.—This sub-species of the Caspian terrapin is widely distributed in Spain, Portugal and North-West Africa. It may be found in all types of water, hibernating or aestivating according to the local climate, and is also highly mobile on land.

Breeding Habits.—Only four or five eggs are laid, usually in July.

Care in Captivity. Newly hatched terrapins are no more hardy than the equivalent Pond Tortoises, amd will demand similar treatment.

The adults are hardier than their restricted Southerly distribution would suggest, and will do extremely well in an outdoor reptiliary, simple enclosure or greenhouse. Small specimens should not be allowed to spend the Winter outdoors, but larger animals will hibernate happily in their pond if this has about a foot of water underlain by another foot of mud. Spanish terrapins can also be housed indoors, and should live for many years if given supplementary heat, access to natural sunlight, and really spacious quarters. In general their accommodation and diet should be the same as for *Emys orbicularis*, and they can be integrated into similar balanced communities.

It should be noted when selecting specimens that a cracked, alga-encrusted carapace is not necessarily an omen of ill-health. In fact it is a direct consequence of the particular climate in which they normally live, characterized by wide fluctuations in temperature, and the seasonal nature of ponds and streams.

The Spanish terrapin is an attractive animal, and one that well deserves a place in any community of the larger Reptiles.

34. The Caspian Terrapin (*Clemmys caspica rivulata*)

Description.—This species is slightly smaller than the preceding one, growing to about 20 cms. in length. It closely resembles the Spanish terrapin, but can be distinguished by some delicate notches on the upper jaw. The carapace is olive-green, and covered by a mesh of dark-bordered grey lines that become less obvious with increasing age.

Distribution.—The European range of this species includes Southern Yugoslavia, much of mainland Greece, the Ionian islands, the Cyclades and Cyprus. It also occurs in Syria and Asia Minor. Like the

Spanish terrapin it is a sub-species of the Asian Clemmys caspica caspica. It inhabits the same type of country as its close relations, and is very lively both on land and in the water.

Breeding Habits.—These can safely be treated as the same as those of *Clemmys caspica leprosa*.

Care in Captivity.—The Caspian terrapin is not often imported into this country. However, it will cause few problems, is very hardy, and will thrive under the same conditions as the Spanish terrapin.

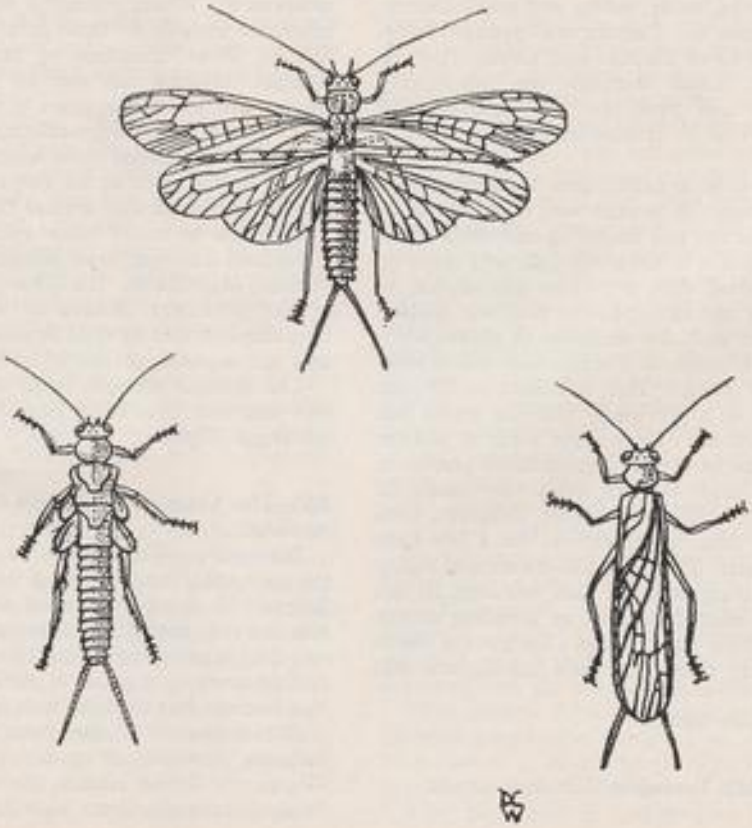
The next article will concern itself with our most familiar native lacertid, the Common lizard.

STONEFLIES

by David C. Wareham

THE STONEFLY is a rather primitive insect which has remained almost unchanged since it first appeared on this Earth some 250 million years ago. Altogether something like 1,400 different species have been recorded throughout the world, and these have been divided into seven families, three of which occur in Britain. They form the Order Plecoptera.

The adult insect has a thick, soft body, with a



broad head. The thread-like antennae are long and segmented. It has two pairs of wings and the fore-wings are narrower than the hind-wings. Both pairs are interlaced with numerous veins, and when the stonefly is at rest, they are folded up fan-like and held flat over the body. The segmented abdomen ends in a pair of characteristic "tails" or cerci and these help to identify the species.

Stoneflies are extremely weak and slow in flight. In fact they fly very little, spending most of their time resting on tree trunks, fences and walls, etc., always in the vicinity of water. When they do fly, however, it is usually for a brief period during warm sunshine. The adults are extremely short-lived and, because their mouths are almost non-existent, take no food, although they do drink occasionally.

Females lay anything up to 2,000 eggs, the number depending largely on the particular species. The eggs are carried for a while, beneath the female's abdomen, in a ball-like mass, and then, alighting on a floating leaf, she deposits them in the water. Once in the water, the eggs separate from each other. As they drift about in the stream they become anchored, by means of long threads, to water plants and stones.

The *larvae*, or nymphs, are completely aquatic, and are similar in appearance to those of the mayfly, *Ephemera vulgata*, but can be distinguished from such by the fact that they have no gills. Stoneflies generally prefer swift running rivers and streams for the simple reason that these are usually well oxygenated. They are therefore most common in the North, particularly in hilly and mountainous regions. However, because of the increasing pollution of our streams and ponds, etc., a great many have now disappeared from places where they were once quite numerous.

Stonefly *larvae* live for a year or more, and during this time they moult often. There is no metamorphosis, or pupal stage, and after several of these moults, the wings of the final adult begin to develop appearing as small sacs on the *larva's* thorax. Their legs are generally uniform in size and fringed with fine hairs. Like adult stoneflies, the *larvae* are not very mobile and, for aquatic creatures, are poor swimmers. Much of their time is spent hiding under stones or in small chambers in the mud around the water's edge. From these places they prey upon water insects and other small animal life.

In late spring and early summer, those *larvae* which have reached their full development crawl out of the water and attach themselves to rocks and stems of water plants. After a short time the skin of the *larva* splits open. Slowly, like a butterfly breaking out of its *pupa*, the adult stonefly works its way out of the larval case, and having done so, sits motionless to expand and dry its wings before crawling away to hide amongst the water-side foliage. They are usually a dull brown in colour, *Perla bicaudata*, one of the common species, being a dark brown with a yellowish streak on the head and thorax. *Chloroperla viridis*, however, is a yellowish brown with grey-green wings. It emerges in mid-summer and is more active than *Perla bicaudata*, and is able to fly and run quite swiftly. For reasons of camouflage, brown coloured species are generally found on dark objects such as rocks, fences and tree trunks, whilst the greenish ones tend to stay near plants and reeds.

Stonefly *larvae* do not do well in the aquarium because they really need a supply of constantly flowing and well oxygenated water. This means providing an elaborate set-up, and this is usually beyond the beginner. They can, however, be caught quite easily in their adult stage, with a net or even by hand. Because of their slow and feeble flight, they only have to be tapped lightly and they immediately fall to the ground, where they can then be transferred to a collecting jar. They can also be attracted to light, often in large numbers, on suitable warm summer evenings.

Altogether there are some 30 or more British species of stonefly, about a dozen of which are "large" and they are well known and sought after by anglers as bait for fish, and in particular for trout.

News from AQUARISTS' SOCIETIES

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

We regret that owing to pressure on space a number of Society Show results have been held over to next month.

THERE were 518 entries for the second **Blakeborough** Open Show held in April. The Best in Show award was won by Mr. and Mrs. Marshallsea (Oldham) with a first in the Loach and Botia class. Other results were as follow: Swordtails: 1, Susan Clarke (Aireborough); 2, T. Douglas (Hull); 3, A. Kaye (Top Ten). Platties: 1, Mr. and Mrs. Gates (Pontefract); 2, Mr. and Mrs. Copley (Doncaster); 3, J. and H. Snowden (York). Mollies: 1, D. Povey (Blakeborough); 2, J. S. Hall (Aireborough); 3, T. Smith (Sheffield). A.O.V. Livebearer: 1, A. Moss (Huddersfield); 2, J. A. Whiteley (Aireborough); 3, Mr. Sibson (Worksop). Small Characins: 1 and 2, Mr. Cartwright (Huddersfield); 3, Mr. and Mrs. Stone (Chesterfield). Large Characins: 1, D. Mosley (Keighley); 2, Susan Clarke (Aireborough); 3, Mr. and Mrs. Daines (Doncaster). Small Barbs: 1, D. Moylan (Blakeborough); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. Daines (Doncaster). Large Barbs: 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. Daines (Doncaster); 3, B. Runnicles (Horsforth). Dwarf Cichlids: 1, J. A. Whithey (Aireborough); 2, A. Moss (Huddersfield); 3, Miss D. Stephens (Pontefract). Large Cichlids: 1, Mr. and Mrs. Gilding (Gainsborough); 2, Mrs. Freeman (Swillington); 3, G. Thickbroom (Castleford). Angels: 1, 2 and 3, Mr. and Mrs. P. Bull (Cresswell). Colisa: 1, Mr. and Mrs. Cohen (Pontefract); 2, K. Barratt (Doncaster); 3, Mr. and Mrs. Smith (Sheffield). A.O.V. Anabantid: 1, Mr. and Mrs. Cohen (Pontefract); 2, G. Twidale (York); 3, D. Hudson (Leeds G.P.O.). Fighters: 1 and 2, A. Curchin (Castleford); 3, M. and D. Laycock. Danios: 1, A. Moss (Huddersfield); 2, Mr. and Mrs. Wells (Doncaster); 3, T. Smith (Sheffield). Minnows: 1, J. Furness (Castleford); 2 and 3, T. Smith (Sheffield). Rasbora: 1, Mr. and Mrs. Gilding (Gainsborough); 2 and 3, Mr. and Mrs. Fletcher (Doncaster). Sharks: 1, T. Smith (Sheffield); 2, J. A. Whitley (Aireborough); 3, W. Blundell (Rossington). Flying Fox: 1, G. Thickbroome (Castleford); 2, T. Smith (Sheffield); 3, Mr. and Mrs. Gates (Pontefract). Killies: 1, J. Mosley (Keighley); 2, Mr. and Mrs. Blades (Cresswell); 3, A. Curchin (Castleford). Corydoras: 1 and 3, Mr. and Mrs. Wells (Doncaster); 2, Mr. and Mrs. Clarke (Aireborough). A.O.V. Catfish: 1, Mr. and Mrs. Copley (Doncaster); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Wells (Doncaster). Loach and Botia: 1, Mr. and Mrs. Marshallsea (Oldham); 2, Mr. and Mrs. Clarke (Aireborough); 3, Mr. and Mrs. Toyne (Sheaf Valley). Pairs (Livebearers): 1, Mr. and Mrs. Parkes (Sheaf Valley); 2, Mr. and Mrs. Marshallsea (Oldham); 3, G. Ibbetson (Keighley). Pairs (Egglayers): 1, T. Smith (Sheffield); 2, J. Mosley (Keighley); 3, Mr. and Mrs. Toyne (Sheaf Valley). Breeders (Livebearers): 1, A. Moss (Huddersfield); 2, Mr. and Mrs. Parkes (Sheaf Valley); 3, G. Andrews (Hull). Breeders (Egglayers): 1, A. Curchin (Castleford); 2, Mr. and Mrs. Gilding (Gainsborough); 3, A. Moss (Huddersfield). Common Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1 and 2, J. S. Hall (Aireborough); 3, F. Foote (Accrington). A.O.V. Coldwater: 1 and 2, J. S. Hall (Aireborough); 3, D. Mosley (Keighley). A.O.V.: 1, A. Barrett (Castleford); 2, G. Thickbroome (Castleford); 3, A. E. Heap (Blakeborough). Furnished Mini-Jar: 1 and 2, M. Wild (Accrington); 3, Mr. and Mrs. Toyne (Sheaf Valley).

* * *

THERE were over 550 entries at the **Goole and District A.S.** first open show. The results were as follow: Guppies: 1, G. Gillespie (Castleford); 2, K. Barrett (Doncaster); 3, Mr. and Mrs. Thickbroom (Castleford). Platies: 1, J. G. Robertson (Mt. Pleasant); 2 and 3, Mr. and Mrs. Copley (Doncaster). Mollies: 1, T. Smith (Sheffield); 2, R. Brown (Scunthorpe); 3, P. Atkinson (Grimsby and Cleethorpes). Swordtails: 1, J. Furness (Castleford); 2, T. Smith (Sheffield); 3, Miss S. Clarke (Aireborough). A.O.V. Livebearers: 1, Mr. and Mrs. Parks (Sheaf Valley); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, Mr. and Mrs. Daines (Doncaster). Characins (small): 1, D. Laycock (Sheffield); 2, Mr. Binns (Scunthorpe); 3, Mr. and Mrs. D. Calder (Scunthorpe). Characins (large): 1, Mr. and Mrs. Thickbroom (Castleford); 2, Mr. and Mrs. Shipley (Goole); 3, Mr. and Mrs. Scarll (Goole). Sharks and Foxes: 1, Mr. and Mrs. Scarll (Goole); 2, Mr. and Mrs. Bailey (Sherwood); 3, Mr. and Mrs. Thickbroom (Castleford). Rasboras, Danios and Minnows: 1, A. Barrett (Castleford); 2, G. Gillespie (Castlefoed); 3, Mr. and Mrs. Gilding (Gainsborough). Barbs (small): 1, Mr. Horsefield (Thorne); 2, J. W. Dickerson (Pontefract); 3, Mr. and Mrs. Harris (Gainsborough). Barbs (large): 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. Roberts (Doncaster); 3, Mr. Jackson (Grimsby and Cleethorpes). Cichlids (small): 1, Mr. and Mrs. Blades (Cresswell); 2, Mr. and Mrs. Sellers (Lincoln); 3, Mr. and Mrs. Scarll (Goole). Cichlids (large): 1, Mr. and Mrs. Gilding (Gainsborough); 2, Mr. Reid (Worksop); 3, Mr. and Mrs. Snowden (York and District). Angels: 1 and 3, Mr. and Mrs. Bull (Cresswell); 2, Mr. and Mrs. Dixon (Gainsborough). Corydoras: 1, Mr. and Mrs. Sellers (Lincoln); 2, A. Douglas (Hull); 3, Mr. and Mrs. Clarke (Aireborough). A.O.V. Catfish: 1, Mr. Brookshaw (Thorne); 2, D. Wethers (Iboracum); 3, J. S. Hall (Aireborough). Loaches: 1, B. Pulford (Grimsby and Cleethorpes); 2, J. Harvey and R. Holt (Goole); 3, Mr. and Mrs. Shipley (Goole). Anabantids (small): 1, Mr. and Mrs. Scarll (Goole); 2, Mr. and Mrs. Milne (Doncaster); 3, Mr. and Mrs. Cohen (Pontefract). Anabantids (large): 1, Mr. and Mrs. Cohen (Pontefract); 2, G. Hancock (Hull); 3, Mr. and Mrs. Batch (Hull). Fighters: 1, Mr. and Mrs. Sellers (Lincoln); 2, Mr. and Mrs. Milne (Doncaster); 3, Miss S. Clarke (Aireborough). Toothcarps: 1, J. G. Robertson (Mt. Pleasant); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. Harris (Gainsborough). A.O.V. Tropicals: 1, A. Barrett (Castleford); 2, Mr. and Mrs. Thickbroom (Castleford); 3, T. Douglas (Hull). Breeders Livebearers: 1, Mr. Andrews (Hull); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, Mr. and Mrs. Furness (Castlefoed). Breeders Egglayers: 1, Mr. and Mrs. Gilding (Gainsborough); 2, Mr. Banks (Thorne); 3, Mr. and Mrs. Perkins (Worksop). Pairs Livebearers: 1, Mr. and Mrs. Parks (Sheaf Valley); 2, E. Kirk & Sons (Grimsby Town); 3, J. Furness (Castleford). Pairs Egglayers: 1, K. Barrett (Doncaster); 2, Mr. Wethers (Eboracum); 3, Mr. and Mrs. Shipley (Goole). Ladies: 1, M. Thickbroom (Castleford); 2, Mrs. Copley (Doncaster); 3, Mrs. Cohen (Pontefract). Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Coldwater: 1 and 2, J. S. Hall (Aireborough); 3, P. Casey (York). Juniors: 1, M. Thickbroom (Castleford); 2, Miss S. Clarke (Aireborough); 3, Miss D. Bailey (Sherwood).

* * *

OPEN show results of the **Croydon A.S.** were as follow: Class B: 1, B. Bissoon (Basingstoke); 2, Q. Taylor (Reigate and Redhill); 3, L. S. Derrick (Croydon); 4, B. C. Fry. Class C: 1, J. A. Pollard (Kingston); 2, T. B. Adams (Hastings); 3, Mr. Moore; 4, Mrs. M. Nethersell (Riverside). Class CA: 1, B. Bissoon (Basingstoke); 2, D. P. Ingle (Chingford); 3, A. J. H. Smith (Croydon); 4, T. Taylor. Class CB: F.B.A.S. Championship Trophy: 1, L. J. Brazier (Sudbury); 2, B. Bissoon (Basingstoke); 3, J. M. Wood (Reigate and Redhill); 4, J. H. Jackson (Basingstoke). Class D: 1 and 3, Mr. and Mrs. Burtles (Mid Sussex); 2, P. Jarvis (Freelance); 4, D. J. Wiltshire (Croydon). Class DA: 1, J. M. Wood (Reigate and Redhill); 2, Mr. and Mrs. Martin (North Kent); 3, D. J. Wiltshire (Croydon); 4, C. J. Thorp (Reigate and Redhill). Class DB: 1, A. Heath (Lewisham); 2, J. Brown (Croydon); 3, B. Bissoon (Basingstoke); 4, C. J. Thorp (Reigate and Redhill). Class E: 1, T. Cruickshank (Ealing); 2, D. J. Mackay (Kingston); 3, T. B. Adams (Hastings); 4, R. D. Wright (E. Dulwich). Class EA: 1, T. Taylor (Basingstoke); 2, L. J. Brazier (Sudbury); 3, A. Marshall, Snr. (Basingstoke); 4, J. M. Wood (Reigate and Redhill). Class F: 1, R. D. Wright (E. Dulwich); 2, J. H. Jackson (Basingstoke); 3, A. Harmsworth (Basingstoke); 4, B. W. F. Smith (Kingston). Class G: 1 and 3, R. D. Wright (E. Dulwich); 2, Mrs. M. Nethersell (Riverside); 4, J. M. Wood (Reigate and Redhill). Class H: 1, R. D. Wright (E. Dulwich); 2, Mr. and Mrs. Martin (North Kent); 3, L. J. Brazier (Sudbury); 4, A. Marshall, Snr. (Basingstoke). Class J: 1, S. Mason (Roehampton); 2, K. Barrett (Kingston); 3, D. J. Mackay (Kingston); 4, Mr. and Mrs. Dryden (Croydon). Class K: 1, P. Brenchley (E. Dulwich); 2, D. J. Mackay (Kingston); 3, I. Winters (Basingstoke); 4, H. H. Wiltshire (Croydon). Class L: 1, J. Parker (North Kent); 2, R. D. Wright (E. Dulwich); 3, C. Martin (North Kent); 4, Mrs. M. Nethersell (Riverside). Class M: 1, R. Goodson (Roehampton); 2, B. Lough (Kingston); 3, J. Brown (Croydon); 4, Mr. and Mrs. C. J. Martin (North Kent). Class NBM: 1, Mrs. A. Lefevre (Kingston); 2, D. J. Mackay (Kingston); 3, J. A. Pollard (Kingston); 4, C. Brook. Class NOT: 1 and 4, Mr. and Mrs. Dryden (Croydon); 2, Mrs. D. Barrett (Kingston); 3, A. Heath (Lewisham). Class O: 1, T. Cruickshank (Ealing); 2 and 3, B. C. Fry; 4, A. Day (Croydon). Class P: 1 and 2, L. J. Brazier (Sudbury); 3, B. C. Fry; 4, B. W. Smith (Kingston). Class Q: 1, Mr. and Mrs. Dryden (Croydon); 2, Mrs. Adams (Hastings); 3, T. Cruickshank (Ealing); 4, J. Livings (Hastings). Class R: 1 and 2, M. D. Chapman (Basingstoke); 3, P. Brenchey (E. Dulwich); 4, S. Mason (Roehampton). Class S: 1, Mrs. M. Nethersell (Riverside); 2, T. Taylor (Basingstoke); 3, S. Mason (Roehampton); 4, K. Barrett (Kingston). Class T: 1 and 3, A. Heath (Lewisham); 2, Mrs. D. Barrett (Kingston); 4, Mr. and Mrs. Dryden (Croydon). Class U: 1, J. A. Pollard (Kingston); 2, A. Marshall, Jnr. (Basingstoke); 3, R. Carter (Kingston); 4, B. C. Fry. Class V: 1, E. Binstead (Portsmouth); 2 and 4, A. Marshall (Basingstoke); 3, Mrs. M. Dudley

(S.P.A.S.S.). Class W: 1, C. Bellingham (Tonbridge); 2, R. Parker (North Kent); 3, R. Lefevre (Kingston); 4, Mrs. M. Dudley (S.P.A.S.S.). Class XBM: 1 and 2, T. H. Adams (Hastings); 3, Mr. and Mrs. Burtles (Mid Sussex); 4, J. Jennings. Class XOT: 1, 2, 3 and 4, Mr. and Mrs. Dryden (Croydon).

* * *

WINNERS at the **York A.S.** open show were as follows: Guppies: 1, J. and W. Dickenson (Pontefract); 2, A. E. Heap (Keighley); 3 and 4, Mrs. L. C. Heap (Keighley). Swordtails: 1, Mr. and Mrs. Charlton (Pontefract); 2, Miss S. Clark (Aireborough); 3, Mr. and Mrs. Batch (Hull); 4, T. Douglas (Hull). Mollies: 1, N. Douglas (Four Star); 2, Mr. Dewitt (Doncaster); 3, L. S. Hunter (York); 4, K. Barrett (Doncaster). Platies: 1, G. Newbould (Castleford); 2 and 3, Mr. and Mrs. Gates (Pontefract); 4, Mr. and Mrs. Blades (Creswell). A.O.V. Livebearer: 1, P. Staniforth (Don Valley); 2, J. A. Whiteley (Aireborough); 3, Mr. and Mrs. Blades (Creswell); 4, Mr. and Mrs. Parkes (Sheaf Valley). Small Barbs: 1, M. Richardson (York); 2, J. and H. Snowden (York); 3, Mr. and Mrs. Blades (Creswell); 4, Mr. and Mrs. Daines (Doncaster). Large Barbs: 1, Mr. and Mrs. Cohen (Pontefract); 2 and 3, L. S. Hunter (York); 4, N. Taylor (Gainsborough). Small Characins: 1, Mr. and Mrs. Clark (Aireborough); 2, Mr. and Mrs. Shipley (Goole); 3, A. E. Heap (Keighley); 4, D. Weathers (Eboracum). Medium Characins: 1, A. Batch (Hull); 2, Miss S. Clark (Aireborough); 3, R. Holt (Goole); 4, Mr. and Mrs. Scarll (Goole). Rift Valley Cichlids: 1, 2 and 4, Mr. and Mrs. Gilding (Gainsborough); 3, M. Richardson (York). Corydoras: 1 and 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. Goddard (Bridlington); 4, A. S. Allison (York). Large Characins: 1, Mr. and Mrs. Welford (Cleveland); 2, Mr. and Mrs. Daines (Doncaster); 3, G. Thickbroom (Castleford); 4, Mr. and Mrs. Scarll (Goole). Rasboras, Danios and Minnows: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. and Mrs. Gilding (Gainsborough); 3, Mrs. J. Stevens (Pontefract); 4, G. Gillespie (Castleford). Sharks and Flying Fox: 1, W. Blundell (Rossington); 2, Mr. and Mrs. Scarll (Goole); 3, R. Holt (Goole); 4, Mr. and Mrs. D. Hockley (York). Siamese Fighters: 1, A. Curchin (Castleford); 2, G. Malpass (Castleford); 3, G. B. Hawksby (York); 4, Mr. and Mrs. Gates (Pontefract). Small Anabantids: 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. Shipley (Goole); 3, K. Barrett (Doncaster); 4, Mr. and Mrs. Scarll (Goole). Large Anabantids: 1, K. Keene (Eboracum); 2, Mr. and Mrs. Cohen (Pontefract); 3, G. Twydale (York); 4, R. Thompson (Bishop Auckland). Dwarf Cichlids: 1, G. Gillespie (Castleford); 2, L. S. Hunter (York); 3, D. M. Foster (Don Valley); 4, J. A. Whiteley (Aireborough). Large Cichlids: 1, L. S. Hunter (York); 2, D. M. Foster (Don Valley); 3, A. E. Whitelock (Tadcaster); 4, G. Thickbroom (Castleford). Angels: 1, H. Kuhn (Lincoln); 2, Mr. and Mrs. P. Bull (Creswell); 3, Mr. and Mrs. Dixon (Gainsborough); 4, W. Edwards (Castleford). Common Goldfish: 1, S. Walsh (Accrington); 2 and 3, Mr. and Mrs. B. Foster (Creswell); 4, D. Fox (Scarborough). Fancy Goldfish: 1, 2 and 3, C. H. Whitney (Accrington); 4, Mr. and Mrs. Toyne (Sheaf Valley). Loach and Botia: 1, Mr. and Mrs. Marshallsea (Oldham); 2, Mr. and Mrs. Clark (Aireborough); 3, Mr. and Mrs. Toyne (Sheaf Valley); 4, R. Holt (Goole). A.O.V. Catfish: 1 and 4, A. S. Allison (York); 2, Mr. and Mrs. Low (Cleveland); 3, Mrs. Copley (Doncaster). B.L. Toothcarps: 1, Mr. and Mrs. Marshallsea (Oldham); 2, A. Crowther (B.K.A. Collingham); 3 and 4, A. Curchin (Castleford). Breeders Livebearers: 1, Mr. and Mrs. Parkes (Sheaf Valley); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, G. Andrews (Hull); 4, Mr. and Mrs. Marshallsea (Oldham). Breeders (Egglayers): 1, H. Kuhn (Lincoln); 2, Mr. and Mrs. Gilding (Gainsborough); 3, Mr. and Mrs. Stevens (Pontefract); 4, A. Curchin (Castleford). Matched Pairs (Livebearers): 1 and 2, Mr. and Mrs. Parkes (Sheaf Valley); 3, G. Ibbetson (Keighley); 4, Mr. and Mrs. Toyne (Sheaf Valley). Matched Pairs (Egglayers): 1, L. S. Hunter (York); 2, Mr. and Mrs. Clark (Aireborough); 3, Mr. and Mrs. Scarll (Goole); 4, D. Weathers (Eboracum). Shubunkin: 1, K. and M. Wood (York); 2 and 4, S. Walsh (Accrington); 3, C. H. Whitney (Accrington). A.O.V. Coldwater: 1, Mr. and Mrs. Blizard (Sheffield); 2, S. Walsh (Accrington); 3, W. Pemberton (Scarborough); 4, K. and M. Wood (York). Junior: 1, W. Thickbroom (Castleford); 2 and 3, Miss S. Clark (Aireborough); 4, A. Thompson (Bishop Auckland). A.V. Proved Female: 1, Mr. and Mrs. Blades (Creswell); 2, Mr. and Mrs. Daines (Doncaster); 3, G. Twydal (York); 4, T. Douglas (Hull). A.O.V. Tropical: 1, G. Thickbroom (Castleford); 2, A. E. Heap (Keighley); 3, Mr. and Mrs. P. Bull (Creswell); 4, C. Saymer (Eboracum). Best Fish in Show: Mr. and Mrs. Marshallsea (Oldham) Chain Botia (82 points).

* * *

THERE was a record entry of over 500 exhibits at the **Osram A.S.** show. Results were as follow: Anabantids: 1, J. Goodgen (Hyde); 2, Miss Gregory (Nelson); 3, Mr. and Mrs. Ward (Middleton). Fighters: 1, J. Lomax (Salford); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, J. Forness (Castleton). Small Barbs: 1, F. E. Gregory (Oldham); 2 and 3, Mr. and Mrs. Birdsell (Aireborough). Large Barbs: 1, Mr. and Mrs. Cohen (Pontefract); 2, G. Shaw (Morecambe Bay); 3, J. S. Hall (Aireborough). Labeos, Sharks and Foxes: 1, G. Thickbroom (Castleford); 2, R. Walker (Morecambe Bay); 3, T. Smith (Sheffield). Characins (small): 1, Miss Gregory (Nelson); 2, Mr. and Mrs. Clarke (Abra); 3, M. and D. Laycock (Sheffield). Characins (medium): 1, R. Walker (Morecambe Bay); 2, M. and D. Berry (Velley); 3, Mrs. Walker (Morecambe Bay). Characins (large): 1, G. Thickbroom (Castleford); 2, J. E. Shore (Osram); 3, C. Goodman (Oldham). Cichlids (dwarf): 1, Miss M. Tongue (Oldham); 2, L. P. Graham (East Lancs.); 3, G. Gillespie (Castleton). Cichlids (angels): 1, Mr. and Mrs. Dickson (Gainsborough); 2, G. Wilkson (Hyde); 3, Mr. Leadbetter (Fleetwood). Cichlids (A.O.V.): 1, G. Wilkson (Hyde); 2, G. Wolstenholme (Heywood); 3, G. Thickbroom (Castleford). Tooth Carps: 1, H. Marshallsea (Oldham); 2, Mr. Gabe (Chesterfield); 3, Mr. and Mrs. Toyne (Sheaf Valley). Rasboras: 1, Mr. and Mrs. Gilding (Gainsborough); 2, G. Shaw (Morecambe Bay); 3, Mr. Leadbetter (Fleetwood). Danios: 1, T. Smith (Sheffield); 2, A. Kaye (Top Ten); 3, J. S. Hall (Aireborough). Minnows: 1, T. Smith (Sheffield); 2, J. Forness (Castleton); 3, Mr. and Mrs. Toyne (Sheaf Valley). Guppies: 1, J. Newbold (Castleford); 2, G. Leadbetter (Fleetwood); 3, G. Thickbroom (Castleford). Swordtails: 1, A. Kaye (Top Ten); 2, B. Black (Fleetwood); 3, G. Leadbetter (Fleetwood). Mollies: 1, Mr. Beckenham (Oldham); 2, S. Clarke (Abra); 3, T. Smith (Sheffield). Platies: 1, 2 and 3, C. Goodman (Oldham). A.O.V. Livebearers: 1, Mr. Gibson (Worksop); 2, Mrs. Rhodes (Forstar); 3, Mr. Leadbetter (Fleetwood). Loaches: 1, F. E. Gregory (Oldham); 2, R. Crompton (Accrington); 3, H. Marshallsea (Oldham). Corydoras Catfish: 1, Miss M. Tongue (Oldham); 2, Miss J. Gullane (Buxton); 3, G. Batchelor (Loyne). A.O.V. Catfish: 1, T. S. Hall (Aireborough); 2, G. Gillespie (Castleton); 3, Mr. Leadbetter (Fleetwood). Goldfish: 1 and 3, J. S. Hall (Aireborough); 2, Mrs. Craddock (Belle Vue). Shubunkins: 1, H. Penhall (Osram); 2, J. Witsey (Accrington); 3, S. Walsh (Accrington). Veiltails: 1, J. S. Hall (Aireborough). Orandas and Lionheads: 1 and 2, J. S. Hall (Aireborough); 3, J. Whitsey (Accrington). Fantails: 1, S. Walsh (Accrington); 2, J. Gulene (Buxton); 3, J. Whitsey (Accrington). Moors: 1 and 2, F. Foote (Accrington); 3, J. Whitsey (Accrington). A.O.V. Asian and U.S.A.: 1, L. P. Graham (East Lancs.); 2 and 3, J. S. Hall (Aireborough). A.O.V. European: 1 and 3, J. S. Hall (Aireborough); 2, J. Whitsey (Accrington). A.O.V. Fancy Goldfish not listed: 1, J. Whitsey (Accrington); 2, J. S. Hall (Aireborough). Breeders (Egglayers): 1, J. Gabe (Chesterfield); 2, Mr. and Mrs. Gilding (Gainsborough); 3, J. E. Shore (Osram). Breeders (Livebearers): 1, C. Beckenham (Oldham); 2, Mr. and Mrs. Parkes (Sheaf Valley); 3, Mr. Leadbetter (Fleetwood). A.O.V. not listed: 1 and 3, A. Barrett (Castleford); 2, G. Thickbroom (Castleford). Pairs (Egglayers): 1, F. E. Gregory (Oldham); 2, Mr. and Mrs. Clarke (Abra); 3, Mr. Leadbetter (Fleetwood). Pair (Livebearers): 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mr. Leadbetter (Fleetwood); 3, J. Kaye (Top Ten). Osram Juniors (Egglayers): 1, Pauline Webber (Osram); 2 and 3, Barbara Murgetroyd (Osram). Osram Juniors (Livebearers): 1 and 3, John Boardman (Osram); 2, Edward Pianziek (Osram). Best Tropical Fish in Show: F. E. Gregory (Oldham). Best Cold Water Fish in Show: Mr. Whitsey (Accrington). Highest pointed Osram entry: H. Penhall. The Mackey Trophy for the highest pointed Society: Oldham A.S.

* * *

THE **Gloucester A.S.** held their second annual open show recently and there were over 400 exhibits. Outstanding trophy winner of the day was Nigel Gray of Bristol who collected 5 first, 5 second, 3 third and 3 fourth awards and also the trophy for the most accumulated points. Results were:—Guppies: 1, G. B. Ludlow (Evesham); 2, N. Burton (Trowbridge); 3, B. R. Goll (Evesham); 4, P. Greenwood (Bishops Cleeve). Guppies (female): 1 and 3, B. R. Goll (Evesham); 2, P. Greenwood (Bishops Cleeve); 4, D. R. Rossi (Bishops Cleeve). Mollies: 1, 2 and 3, N. Gray (Bristol); 4, R. A. Bennett (Yate). Platies: 1, W. Furness (Rubery Select); 2, C. C. Lyon (Gloucester); 3 and 4, C. Higgs (Gloucester). Swordtails: 1 and 4, N. Gray (Bristol); 2, G. B. Ludlow (Bishops Cleeve); 3, Mr. and Mrs. Press (Bath). Barbs (large): 1, A. B. Faulkner (Redditch); 2, C. Rossiter (Gloucester); 3, C. Russell (Bath); 4, B. R. Goll (Evesham). Barbs (small): 1, C. Rossiter (Gloucester); 2, N. Gray; 3 and 4, P. Young (Gloucester). Characins: 1, A. Williams (Rubery Select); 2, B. Walker (Gloucester); 3, C. Higgs (Gloucester); 4, C. Russell (Bath). A.O.V. Characins: 1, P. Greenwood; 2, 3 and 4, N. Gray. Angels: 1 and 2, N. Gray; 3, J. B. Ludlow; 4, B. Walker (Gloucester). Cichlid (large): 1, L. Griffiths (Gloucester); 2, R. A. Bennett (Bristol); 3, B. Snell (Bristol); 4, C. Rossiter (Gloucester). Cichlids (small): 1, J. F. Davidson (Didcot); 2, J. Brown (Swindon); 3, B. Snell; 4, R. A. Bennett. Catfish: 1 and 2, N. Gray; 3, C. E. Scriven (Cheltenham); 4, A. Williams (Rubery Select). A.O.V. Catfish: 1, B. R. Goll; 2, Master R. Bowd (Gloucester); 3, A. B. Faulkner; 4, Mr. and Mrs. Press. Fighters: 1, E. McQuade (Canada); 2 and 3, Mr. and Mrs. Press; 4, A. B. Faulkner. Labyrinths: 1, A. B. Faulkner; 2, M. Butcher (Bradford-on-Avon). Labyrinths: 1, J. F. Davidson (Didcot); 2, G. Press (Bath); 3, B. Snell; 4, G. Perkins (Gloucester). Loaches: 1, C. Russell; 2, Mr. and Mrs. Press; 3 and 4, N. Gray. Rasboras: 1 and 3, G. Perkins (Gloucester); 2, A. Williams (Gloucester); 4, C. Webb (Bristol). Danios: 1 and 3, M. Butcher (Bradford-on-Avon); 2, M. Giler (Cheltenham); 4, C. Webb. A.O.V. Tropical: 1, W. Massey (Rubery Select); 2, P. Rossi (Cheltenham); 3, B. R. Goll; 4, A. Heels (Cheltenham). Pairs (Livebearers): 1, B. R. Goll; 2, C. Dykes; 3, A. J. Gale (Hereford); 4, M. Toomey (Gloucester). Pairs (Egglayers): 1, P. Young (Gloucester); 2 and 4, C. Russell; 3, D. Williams. Teams (Livebearers): 1, N. Gray; 2, A. Watts; 3, K. Press; 4, B. R. Goll. Teams (Egglayers): 1, B. R. Goll; 2, C. Russell; 3 and 4, J. Brown. Shubunkins: 1, I. Wood (Gloucester); 2 and 3, R. Shakespeare; 4, L. Griffiths (Gloucester). Coldwater Fancy: 1, M. Butcher; 2, R. Shakespeare; 3, C. J. Giles; 4, Mr. and Mrs. Press. Goldfish: 1, B. R. Goll; 2, Mr. and Mrs. Press; 3, M. Butcher; 4, P. Rossi. A.O.V. Coldwater: 1, C. Pratt; 2, M. Butcher; 3, N. Wood (Gloucester); 4, L. Griffiths (Gloucester). Beginners Petfish: 1, Miss J. Sheldon; 2, Mr. Press; 3, Tracey Greenwood; 4, Master Jason Wood. Eleven judges and five trainee judges

were in attendance from the Severnside Aquarists Association and judging was to Severnside standards.

* * *

THE **Derby Regent's A.S.** open show was the most successful to date and it is now essential that new premises are found as the demand for space has now outstripped the present premises. The results were as follow: Guppies: 1, D. Laycock (Sheffield); 2, A. Mifflin (N. Staffs); 3, R. Harlow (D.R.A.S.). Mollies: 1, C. Beckenham (Oldham); 2, Mr. Morrey (Stoke); 3, Mr. Taylor (Sherwood). Swords: 1, M. Darrington (Alfreton); 2, D. Laycock (Sheffield); 3, C. Beckenham (Oldham). Platies: 1, C. Goodman (Oldham); 2, Mrs. D. Hunt (Independent); 3, Miss Lindley (Independent). Small Barbs: 1, Mr. Wright (Alfreton); 2, Mr. Harlow (D.R.A.S.); 3, Mrs. M. Foster (Cresswell). Large Barbs: 1, Mr. Hill (Alfreton); 2, H. Carr (N. Staffs); 3, Mr. Measures (Independent). Small Characins: 1 and 2, D. Laycock (Sheffield); 3, Mr. Sewell (Sherwood). Large Characins: 1, K. Ankers (N. Staffs); 2, T. Smith (Sheffield); 3, P. Whalan (Accrington). Fighters: 1, Clarke Bros. (N. Staffs); 2, B. Rowe (Alfreton); 3, D. Laycock (Sheffield). Small Anabantids: 1, Miss J. Gullane (Buxton); 2, Mrs. Saunders (G.K.N.); 3, M. Foster (Cresswell). Large Anabantids: 1 and 3, Miss J. Gullane (Buxton); 2, A. Thomas (Lucas). Dwarf Cichlids: 1, B. T. Rodgers (Cresswell); 2, G. Gillespie (Castleford); 3, J. Morris (Sutton). Large Cichlids: 1, J. Hall (Burton); 2, K. Hall (G.K.N.); 3, Mr. and Mrs. Stephenson (Sherwood). Angels: 1, Mr. Hill (Alfreton); 2 and 3, Mr. Sewell (Sherwood). Sharks and Foxes: 1, T. Smith (Sheffield); 2, C. Beckenham (Oldham); 3, B. T. Rodgers (Cresswell). Loaches and Botias: 1, K. Thomas (Lucas); 2, Mr. and Mrs. Marshallsea (Oldham); 3, T. Smith (Sheffield). Corydoras: 1 and 3, Clarke Bros. (N. Staffs); 2, K. Brunt (N. Staffs F.T.F.). A.O.V. Catfish: 1, Mr. Hunt (South Derbys); 2, G. Summerfield (F.T.F.); 3, R. Holmes (D.R.A.S.). Killies: 1, D. J. Whiteside (B.K.A.); 2, Mr. and Mrs. Marshallsea (Oldham); 3, K. Ankers (N. Staffs). Minnows and Danios: 1 and 3, T. Smith (Sheffield); 2, K. Walsh (Independent). Rasboras: 1, Master A. Barrett (Castleford); 2, R. Mayer (N. Staffs); 3, Mr. Richardson (Loughborough). Livebearer (Pairs): 1, P. Whalan (Accrington); 2, B. T. Rodgers (Cresswell); 3, Mr. and Mrs. Stephenson (Sherwood). Egglayer (Pairs): 1, T. Smith (Sheffield); 2, Master K. Davison (D.R.A.S.); 3, J. Furness (Castleford). Livebearer (Breeders): 1, J. Furness (Castleford); 2, H. Carr (N. Staffs); 3, P. Harrison (Sherwood). Egglayer (Breeders): 1, H. Carr (N. Staffs); 2, Mr. Lane (D.R.A.S.); 3, Mr. Wright (Alfreton). A.O.V. Tropical: 1 and 2, Master A. Barrett (Castleford); 3, D. Robertson (D.R.A.S.). Juniors (Egglayer): 1, Master R. Downing (Sherwood); 2, Miss J. Gullane (Buxton); 3, Master A. Mifflin (N. Staffs). Juniors (Livebearer): 1, M. Whalan (N. Staffs); 2, A. and S. Furness (Castleford); 3, Miss J. Gullane (Buxton). A.V. Goldfish: 1, B. T. Rodgers (Cresswell); 2, Mrs. Robertson (D.R.A.S.); 3, Mr. Layton (Hucknall and Bulwell). Marine Tropical: 1, A. Cartledge (F.T.F.); 2, T. Jerram (D.R.A.S.); 3, Mr. Igoe (Sherwood). Best in Show: K. Ankers (N. Staffs).

* * *

ENTRIES at the **Roehampton** Open Show totalled 658 and were judged by Messrs. Baker, Blake, Brown, Carter, Eason and Towell of the F.B.A.S. Supreme Championship Trophy Class G and Best Fish in Show went to Derek Lambourne. Results: Class Ad: 1, K. Lewis (Roehampton); 2, Mrs. B. Cowell (United); 3, B. Salsbury (United); 4, Mrs. J. Salsbury (United). Class AM: 1, S. Cowell (United); 2, J. Shepherd (Runnymede); 3, B. Salsbury (United); 4, M. Goss (Riverside). Class B: 1, B. Bissoon (Basingstoke); 2, R. Leslie (High Wycombe); 3, A. Marshall (Basingstoke); 4, J. Bellingham (Tonbridge). Class Ba: 1 and 3, K. Smith (Runnymede); 2, Mrs. R. Coyle (Independent); 4, A. Lusby (Mid-Herts.). Class C: 1, Mrs. M. Nethersell (Riverside); 2, M. Strange (Basingstoke); 3, M. West (K.D.A.S.); 4, J. Connolly (B.G.A.S.). Class Ca: 1, T. Taylor (Basingstoke); 2, Mrs. D. Cruickshank (Ealing); 3, Mrs. O. Leslie (High Wycombe); 4, A. P. Taylor (Sudbury). Class D: 1, J. Batts (Ealing); 2, W. F. Sutton (Freelance); 3, J. Connolly (B.G.A.S.); 4, S. Freemantle (Gosport). Class Da: 1, J. Batts (Ealing); 2, Mr. and Mrs. P. Stapley (Hastings); 3, J. W. F. Hughes (Roehampton); 4, E. Stainer (Freelance). Class Db: 1, L. J. Brazier (Sudbury); 2, T. Istead (Uxbridge); 3, M. Strange (Basingstoke); 4, B. Bissoon (Basingstoke). Class Dc: 1, V. Vallely (Ealing); 2, J. W. F. Hughes (Roehampton); 3, A. A. Houghton; 4, Mrs. M. Nethersell (Riverside). Class E: 1, Mrs. S. Hedges (B.G.A.S.); 2, P. Coyle (Independent); 3, D. Armour (Riverside); 4, Mr. Woolley (United). Class Ea: 1 and 2, Mrs. J. Salsbury (United); 3, S. Giles (Roehampton); 4, L. J. Brazier (Sudbury). Class Eb: 1, R. Peck (Basingstoke); 2, T. B. Adams (Hastings); 3, E. A. Holmes (Banbury); 4, R. F. Rumney (Mid-Herts.). Class F: 1, R. A. Ott (Haverhill); 2, Mrs. J. Garrad (Runymede); 3, K. Adams (Southend); 4, M. Walker (B.K.A.). Class G: 1 and 2, D. Lambourne (Roehampton); 3, P. Lambourne (Roehampton); 4, Mrs. M. Nethersell (Riverside). Class H: 1 and 2, Mrs. S. Hedges (B.G.A.S.); 3, L. J. Brazier (Sudbury); 4, W. F. Sutton (Freelance). Class J: 1, A. G. Harmsworth (Basingstoke); 2, T. Taylor (Basingstoke); 3, P. Coyle (Independent); 4, B. West (K.D.A.S.). Class K: 1 and 3, J. Connolly (B.G.A.S.); 2, P. A. Moye (Bletchley); 4, Mrs. J. Salsbury (United). Class L: 1, K. Usher (Anson); 2, R. Leslie (High Wycombe); 3, Mr. Woolley (United); 4, A. P. Taylor (Sudbury). Class M: 1, R. Goodson (Roehampton); 2, Mrs. R. Coyle (Independent); 3, D. R. Purchard (Tonbridge); 4, E. C. Fantham (Sudbury). Class Nb-m: 1, R. Leslie (High Wycombe); 2, S. Adams (B.G.A.S.); 3, L. J. Brazier (Sudbury); 4, Mrs. M. Nethersell (Riverside). Class No-t: 1, A. Lusby (Mid-Herts.); 2, I. R. Pierce (High Wycombe); 3, R. Newman (Uxbridge); 4, E. A. Holmes (Banbury). Class O: 1 and 4, T. Cruickshank (Ealing); 2, V. Vallely (Ealing); 3, Mr. and Mrs. Murphy (Greenford). Class P: 1, L. J. Brazier (Sudbury); 2, K. Lewis (Roehampton); 3, A. C. Tuffin (S.L.A.D.A.S.); 4, P. Coyle (Independent). Class Q: 1, J. Connolly (B.G.A.S.); 2, Mrs. A. M. Adams (Hastings); 3, T. Cruickshank (Ealing); 4, T. Istead (Uxbridge). Class R: 1, P. A. Moye (Bletchley); 2, G. Mason (Roehampton); 3, R. Onslow (Basingstoke); 4, R. C. Burton (Freelance). Class S: 1, T. Taylor (Basingstoke); 2, G. Mason (Roehampton); 3, K. Smith (Runnymede); 4, Mrs. M. Nethersell (Riverside). Class T: 1 and 4, E. C. Fantham (Sudbury); 2, R. Newman (Uxbridge); 3, Mrs. D. Cruickshank (Ealing). Class U: 1 and 3, Mrs. S. Hedges (B.G.A.S.); 2, R. Rich (Basingstoke); 4, K. Graves (S.L.A.D.A.S.). Class V: 1 and 3, R. Rich (Basingstoke); 2, A. Marshall (Basingstoke); 4, Mr. Woolley (United). Class W: 1, R. Goodson (Roehampton); 2, A. Marshall (Basingstoke); 3, C. Mears (K.D.A.S.); 4, Miss T. Hedges (B.G.A.S.). Class Xb-m: 1, Mr. Woolley (United); 2, P. A. Moye (Bletchley); 3, T. B. Adams (Hastings); 4, M. Strange (Basingstoke). Class Xo-t: 1, A. Lusby (Mid-Herts.); 2, R. Newman (Uxbridge); 3 and 4, K. Usher (Anson). Class Z: 1, D. Durrant (S.L.A.D.A.S.); 2 and 4, J. W. F. Hughes (Roehampton); 3, J. H. Jackson (Basingstoke). Juniors: 1, Miss T. Hedges (B.G.A.S.); 2, S. Adams (B.G.A.S.); 3, A. Marshall (Basingstoke); 4, G. Mason (Roehampton). Highest-Pointed Society: Basingstoke.

* * *

RESULTS of the **Dudley & D. A.S.** first open show are as follows: Individual class winners: Class B: 1, P. Barnett (Independent); 2 and 3, K. Done (Pelsall); 4, G. Ludlow (Evesham). Class Ba: 1, Mr. and Mrs. Bird (S.P.A.D.G.); 2, K. Bate (Hinkley); 3, G. Turner (Pelsall); 4, C. James (Dudley). Class C: 1, M. Strange (Basingstoke); 2, B. Roberts (Independent); 3, Mr. Dare (Independent A.S.); 4, P. Barnett (Independent). Class Ca: 1, M. Evans (Independent); 2, Mrs. D. Cruickshank (Ealing); 3, M. Strange (Basingstoke); 4, K. Buxton (G.K.N.). Class Cb: 1, Mr. Clarke (Pelsall); 2, T. Allen (Bedworth); 3 and 4, L. Brazier (Sudbury). Class D: 1, J. Goodman (Gornal Sel); 2, Mrs. I. Strange (Basingstoke); 3, A. Kinsey (Independent); 4, R. J. Farmer (Wednesbury). Class Db: 1 and 3, W. Hickman (Dudley); 2, Mr. Bowes (Independent A.S.); 4, Mr. Clarke (Pelsall). Class E: 1, Attwood and Williams (Rubery Sel); 2, A. Shenton (Wednesbury); 3, T. W. Lowe (G.K.N.); 4, Mr. Holmes (Banbury). Class Ea: 1, P. A. Moye (Sudbury); 2, L. J. Brazier (Sudbury); 3 and 4, Mr. Bowes (Independent A.S.). Class F: 1, R. Marsh (Lower Gornal); 2 and 4, R. J. Farmer (Wednesbury); 3, Mr. Dare (Independent A.S.). Class G: 1, Mr. and Mrs. Bird (S.P.A.D.G.); 2, Mrs. Hall (S.A.S.S.); 3, A. and B. Faulkner (Flyford); 4, Mr. Bowes (Independent A.S.). Class H: 1, G. Turner (Pelsall); 2, Mr. Allen (Independent); 3, L. J. Brazier (Sudbury); 4, J. and C. Stanley (S.A.S.S.). Class J: 1, D. Wilson (Lower Gornal); 2, P. Barnett (Independent); 3, Mr. Goll (Evesham); 4, Mr. Worton (Gornal Sel). Class K: 1, Mr. Dews (M.T.A.); 2, Mr. Passant (M.T.A.); 3, P. A. Moye (Sudbury); 4, G. M. Brazier (Sudbury). Class L: 1, G. Turner (Pelsall); 2, Mr. Sargeant (M.T.A.); 3, Mr. Bowes (Independent A.S.); 4, R. and J. Carr (Kidderminster). Class M: 1, Mr. Worton (Gornal Sel); 2 and 3, C. Pratt (Bedworth); 4, Mr. Salisbury (Bedworth). Class Ma: 1, T. Hughes (S.A.S.S.); 2, Mr. Allen (Independent); 3, M. Beckingham (Dudley); 4, Mr. Bowes (Independent A.S.). Class Nm: 1, 3 and 4, L. J. Brazier (Sudbury); 2, F. Clarke (Pelsall). Class No: 1, M. Strange (Basingstoke); 2, Mr. Holmes (Banbury); 3, K. Bate (Hinkley); 4, Mr. Allen (Independent). Class O: 1, R. J. Farmer (Wednesbury); 2, Attwood and Williams (Rubery Sel); 3, T. A. Cruickshank (Ealing); 4, A. and B. Faulkner (Flyford). Class P: 1, L. J. Brazier (Sudbury); 2, Mr. Payne (Gornal Sel); 3, Attwood and Williams (Rubery Sel); 4, Mr. Salisbury (Bedworth). Class Q: 1, N. Johnstone (Smethwick); 2, T. A. Cruickshank (Ealing); 3, Mr. Peers (Coventry); 4, Mr. Clarke (Pelsall). Class R: 1, F. Clarke (Pelsall); 2, C. Pratt (Bedworth); 3, Attwood and Williams (Rubery Sel); 4, Mr. Goll (Evesham). Class S: 1, Mr. Salisbury (Bedworth); 2, C. Turner (Pelsall); 3, C. Pratt (Bedworth); 4, Mr. Allen (Independent). Class U: 1, C. Rowley (G.K.N.); 2, K. Allen (Pelsall); 3, D. Penwright (G.K.N.); 4, T. Hughes (S.A.S.S.). Class V: 1, Attwood and Williams (Rubery Sel); 2, K. Bate (Hinkley); 3, Mr. Goodall (M.A.P.S.); 4, R. Shakespeare (Bedworth). Class W: 1, C. Pratt (Bedworth); 2, C. Brockhouse (Gornal); 3 and 4, L. Hatfield (Dudley). Class XBM: 1 and 4, D. A. Moye (Sudbury); 2, F. Clarke (Pelsall); 3, R. S. Price (Stourbridge). Class XOT: 1 and 4, Mr. Holmes (Banbery); 2, Mr. Sargeant (M.T.A.); 3, Mrs. Hall (S.A.S.S.). Class YA: 1, M. Bishop (Bishops Cleave); 2, 3 and 4, B. Fleetwood (Gornal Sel). Class YB: 1, 3 and 4, B. Fleetwood (Gornal Sel); 2, T. Carol (B.M.A.). Class Z: 1, 2 and 3, J. Goodman (Gornal Sel); 4, G. Brockhouse (Gornal Sel).

* * *

AT the last meeting of **Slough and D.A.S.** (affiliated to the F.B.A.S.) Mr. Tomkins gave a very interesting talk on general fishkeeping which gave rise to many questions from the club members. At the second meeting in July, K. Ferris gave a talk on Fish Photography. At the table show, R. Miles made a good start towards retaining the Honey Trophy when he achieved first, second and third places in the advanced class, B. Withers came fourth. In the novice class, Mr. Williams came first with a pair of Australian rainbows and in the Livebearer class, B. Withers achieved first place with a swordtail. The secretary, Mrs. E.

Knight, 52 Aldin Avenue South, Slough, will be very pleased to hear of any film or slide shows for hire.

* * *

OPEN show results of the **Southend, Leigh and District A.S.** were as follow: Class AA: 1 and 2, S.L.A.D.A.S. Class AK: 1, E. Booth; 2, K. Appleyard (Thurrock); 3, R. Wall (Thurrock); 4, A. Bates (Thurrock). Class AM: 1, J. Batts (Baling); 2 and 4, J. Salsbury (Harlow); 3, K. Appleyard (Thurrock). Class B: 1, S. Mason (Rochampton); 2, G. Coe (S.L.A.D.A.S.); 3, B. C. Fry; 4, J. Salsbury (Harlow). Class Ba: 1, Mrs. R. Coyle (Independent); 2 and 3, Mr. Hubert (S.L.A.D.A.S.); 4, J. London (Thurrock). Class C: 1, D. Dare (Independent); 2, P. Coyle (Independent); 3, R. Peacock; 4, D. C. M. Durrant (S.L.A.D.A.S.) Class Ca: 1, P. O'Bryan (Thurrock); 2, F. H. Gilham; 3, J. Salsbury (Harlow); 4, P. Coyle (Independent). Class Cb: 1, J. London (Thurrock); 2, 3 and 4, K. Adams (S.L.A.D.A.S.). Class D: 1, J. Batts (Baling); 2, K. Graves (S.L.A.D.A.S.); 3, J. Burtles (Mid Sussex); 4, C. Lyon (S.L.A.D.A.S.). Class Da: 1, E. Booth; 2, B. Keen (Bury St. Edmunds) 3, C. J. Martin (North Kent); 4, J. Batts (Baling). Class Db: 1, A. Tuffin (S.L.A.D.A.S.); 2, V. C. Green (Suffolk); 3, F. Vicker (E.L.A.P.A.); 4, V. Vallely (Baling). Class Dc: 1, D. Dare (Independent); 2 and 4, V. Vallely (Baling); 3, J. Burtles (Mid Sussex). Class E: 1, S. Hedges (B.G.A.S.); 2, P. Coyle (Independent); 3, J. London (Thurrock); 4, D. Little (S.L.A.D.A.S.). Class Ea: 1, D. C. M. Durrant (S.L.A.D.A.S.); 2, G. Wickham (S.L.A.D.A.S.); 3, T. Wooley (Harlow); 4, J. Salsbury (Harlow). Class Eb: 1, J. Batts (Baling); 2, S. Jordan (Harlow); 3, P. O'Bryan (Thurrock); 4, R. Goddard (Harlow). Class F: 1 and 3, K. Adams (S.L.A.D.A.S.); 2, D. Dare (Independent); 4, B. Wright (Thurrock). Class G: 1, P. Lambourne (Rochampton); 2, 3 and 4, B. Wright (Thurrock). Class H: 1, P. Lambourne (Rochampton); 2, J. Batts (Baling); 3 and 4, W. Sutton (Freelance). Class J: 1, S. Mason (Rochampton); 2, K. Adams (S.L.A.D.A.S.); 3, P. O'Bryan (Thurrock); 4, W. Sutton (Freelance). Class K: 1 and 2, P. O'Bryan (Thurrock); 3, G. Coe (S.L.A.D.A.S.); 4, D. C. M. Durrant (S.L.A.D.A.S.). Class L: 1 and 4, C. J. Martin (North Kent); 2, W. Sutton (Freelance); 3, D. Keen (Bury St. Edmunds). Class M: 1, S. Hedges (B.G.A.S.); 2, R. Coyle (Independent); 3, J. London (Thurrock); 4, S. Mason (Rochampton). Class Nb-m: 1, J. Salsbury (Harlow); 2, D. Lambourne (Rochampton); 3, J. Batts (Baling); 4, B. Wright (Thurrock). Class No-t: 1, A. Heath (Lewisham); 2, J. Preston (S.L.A.D.A.S.); 3, B. Robinson; 4, J. London (Thurrock). Class O: 1, J. Murphy (Greenford); 2, B. C. Fry; 3, K. Graves (S.L.A.D.A.S.); 4, V. Vallely (Baling). Class P: 1 and 4, A. Tuffin (S.L.A.D.A.S.); 2, P. Coyle (Independent); 3, D. C. M. Durrant (S.L.A.D.A.S.).Class Q: 1 and 3, P. O'Bryan (Thurrock); 2, D. Livermore (Thurrock); 4, J. London (Thurrock). Class R: 1, K. Adams (S.L.A.D.A.S.); 2, T. Wooley (Harlow); 3, P. O'Bryan (Thurrock); 4, J. London (Thurrock). Class S: 1 and 4, B. Robinson; 2, J. London (Thurrock); 3, D. C. M. Durrant (S.L.A.D.A.S.). Class T: 1, J. Preston (S.L.A.D.A.S.); 2, B. Peacock; 3 and 4, D. Chewright (S.L.A.D.A.S.). Class U: 1 and 3, S. Hedges (B.G.A.S.); 2, K. Adams (S.L.A.D.A.S.); 4, I. Fleming (G.S.G.B.). Class V: 1 and 3, Mr. Lawman (G.S.G.B.); 2, D. Chewright (S.L.A.D.A.S.); 4, T. Wooley (Harlow). Class W: 1, R. Parker (North Kent); 2, S. Hedges (B.G.A.S.); 3, B. C. Fry; 4, P. Mepham (S.L.A.D.A.S.). Class Xb-m: 1, G. Coe (S.L.A.D.A.S.); 2, J. Burtles (Mid Sussex); 3, F. Vicker (E.L.A.P.A.); 4, T. Wooley (Harlow). Class Xo-t: 1, T. Wooley (Harlow); 2, R. Orford (S.L.A.D.A.S.); 3, K. Appleyard (Thurrock); 4, M. J. Wall (Thurrock). Class Ya: 1, 2, 3 and 4, A. Tuffin (S.L.A.D.A.S.). Class Za: 1, D. C. M. Durrant (S.L.A.D.A.S.); 2, P. O'Bryan (Thurrock); 3, D. Keen (Bury St. Edmunds); 4, D. Finch (S.L.A.D.A.S.). Class Zb-c: 1 and 2, A. Tuffin (S.L.A.D.A.S.); 3 and 4, D. C. M. Durrant (S.L.A.D.A.S.). Junior Tropical: 1, R. Wylie (S.L.A.D.A.S.); 2, T. Coyle (Independent); 3, C. Chewright (S.L.A.D.A.S.); 4, T. Hedges (B.G.A.S.). Junior Coldwater: 1, 2 and 3, T. Hedges (B.G.A.S.); 4, J. and M. Burton (S.L.A.D.A.S.)

* * *

MEMBERS elected at the annual general meeting of the **Ilford and District Aquarist's and Pondkeepers' Society** were as follow: President, H. Berger; vice-president, L. Smith; chairman, W. Rowe; vice-chairman L. Smith; treasurer, M. Brill; ass. treasurer, G. Irish; secretary, M. Shadrak; ass. secretary, R. Ruth; show secretary coldwater, H. Berger; show secretary tropical, D. Seaman; press secretary, G. Irish; art council rep., L. Smith; librarian, S. Olley; committee members, J. Hatton; Mr. Saltrack. The monthly table winners were: A.V. Coldwater Fish: 1, H. Berger; 2, W. Rowe; 3 and 4, C. Hackshall. Tropical Breeders Pairs: 1 and 4, W. Rowe; 2, D. Seaman; 3, M. Shadrack. A.V. Tropical Cat Fish: 1 and 4, W. Rowe; 2, R. Ruth; 3, M. Shadrack.

* * *

RESULTS of the **Lincoln and District A.S.** Open Show were: Guppies: 1 and 3, W. Blundell (Rossington); 2, Mr. and Mrs. Milne (Doncaster). Swordtails: 1, 2 and 3, Mr. Kirk and Son (Grimsby). Mollies: 1, Mr. and Mrs. Gabe (Chesterfield); 2, T. Smith (Sheffield); 3, J. S. Hall (Aireborough). Platies: 1 and 3, Mr. and Mrs. Copley (Doncaster); 2, T. Smith (Sheffield). Small Barbs: 1, Mr. and Mrs. Patterson (Grantham); 2, Mr. and Mrs. Shipman (Grantham); 3, Mr. and Mrs. Birdsall (Aireboeough). Large Barbs: 1 and 3, Mr. Jackson (Grimsby & Cleethorpes); 2, Mr. and Mrs. Stanton (Sheffield). Small Characins: 1, D. M. Laycock (Sheffield); 2, Mr. Sews (Sherwood); 3, Mr. and Mrs. Patterson (Grantham). Large Characins: 1, G. Thickbroom (Castleford); 2, Mr. and Mrs. Stokes (Lincoln); 3, T. Smith (Sheffield). Killifish: 1, Mr. and Mrs. Marshallsea (Oldham); 2, Mr. and Mrs. Blades (Cresswell). 3, N. Carr (Doncaster). Minnows and Danios: 1, Mr. and Mrs. Blades (Cresswell); 2, Mr. and Mrs. Tomlinson (Chesterfield); 3, T. Smith (Sheffield). Sharks and Foxes: 1, L. Blundell (Rossington); 2, Mr. and Mrs. Shipman (Grantham); 3, J. S. Hall (Aireborough). Rasboras: 1, Mr. and Mrs. Blades (Cresswell); 2, A. Barrett (Castleford); 3, Mr. and Mrs. Neeton (Scunthorpe). Dwarf Cichlids: 1, Mr. and Mrs. Stanton (Sheffield); 2, Mr. and Mrs. Sellars (Lincoln); 3, Mr. Kuhn (Lincoln). Large Cichlids: 1, Mr. Sewell (Sherwood); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. Gabe (Chesterfield). Angels: 1, Mr. and Mrs. P. Bull (Cresswell); 2, Mr. and Mrs. Sellars (Lincoln); 3, Mr. Sewell (Sherwood). Catfish: 1, Mr. and Mrs. Clarke (Aireborough); 2, Mr. and Mrs. Sellars (Lincoln); 3, Mr. and Mrs. Stanton (Sheffield). Loaches: 1, Mr. and Mrs. Marshallsea (Oldham); 2, K. Barrett (Doncaster); 3, Mr. and Mrs. Clarke (Aireborough). Fighters: 1, Miss S. Clarke (Aireborough); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Sellaes (Lincoln). A.O.V. Anabantid: 1, K. Barrett (Doncaster); 2, Mr. and Mrs. Milne (Doncaster); 3, Mr. and Mrs. Smith (Sheffield). A.O.V. Tropical: 1, A. Barrett (Castleford); 2, G. Thickbroom (Castleford); 3, Mr. and Mrs. Marshallsea (Oldham). Pairs (Egglayers): 1, Mr. and Mrs. Arran (Gainsborough); 2, T. Smith (Sheffield); 3, C. Cartwright (Leicester). Pairs (Livebearers): 1, Mr. and Mrs. Marshallsea (Oldham); 2, D. Kirk and Son (Grimsby); 3, Mr. and Mrs. Daines (Doncaster). Junior Egglayers: 1, Miss M. Thickbroom (Castleford); 2, Master Patterson (Grantham); 3, Miss S. Clarke (Aireborough). Junior Livebearers: 1, Miss Stephenson (Sherwood); 2, Miss M. Thickbroom (Castleford); 3, A. Barrett (Castleford). Breeders (Egglayers): 1 and 2, Mr. Banks (Thorne); 3, Mr. and Mrs. Wells (Doncaster). Breeders (Livebearers): 1, J. Furness (Castleford); 2 and 3, Mr. and Mrs. Borrill and Son (Lincoln). Novice Class: 1, Mrs. M. Sands (Boston); 2, Mr. and Mrs. Steeles (Cresswell); 3, Master G. Cuff (Bradford). Marine Fish: 1, Mr. and Mrs. Caldow (Scunthorpe). Any Tropical Female: 1, Miss S. Clarke (Aireborough); 2, T. Smith (Sheffield); 3, K. Barrett (Doncaster). Ladies Class: 1, Miss M. Thickbroom (Castlefoed); 2, Mrs. D. Copley (Doncaster); 3, Mrs. Stephenson (Sheffield). Goldfish and Comets: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Furnished Tank: 1, J. S. Hall (Aireborough); 2, R. Fletcher (Lincoln); 3, G. Rodgers (Lincoln). Best Fish in Show: Mr. and Mrs. Marshallsea (Oldham).

* * *

THE **G.K.N.P.A.S.** held its Open Show on 10th June last and there was a total number of entries of 480. Results: A. V. Guppy: 1, R. J. Farmer (Wednesbury); 2, R. D. Hughes (Wednesbury); 3, N. Furness (Rubery); 4, K. J. Mathews (Haden). A.V. Livebearer: 1, L. Clarke (Pelsall); 2, Mrs. B. Hall (S.S.A.S.); 3, R. Shakespeare (Bedworth); 4, G. Turner (Pelsall). Characin: 1, D. Penwright (G.K.N.); 2, R. North (Pelsall); 3, Attwood & Williams (Rubery); 4, R. Hickman (Derby Regent). A.O.V. Characin: 1, K. Blunt (N.S.A.S.); 2, Attwood & Williams (Rubery); 3, R. Harlow (Derby Regent); 4, Dean & Hodgetts (Tamworth). Barbs: 1, N. Furness (Rubery); 2, R. T. Ball (Derby Regent); 3, K. Done (Pelsall); 4, Attwood & Williams (Rubery). A.O.V. Barbs: 1, R. Clarke (Pelsall); 2, Master P. Barnett (Independent); 3, D. Hitchman (Rubery); 4, G. Turner (Pelsall). Cichlids: 1, Whitfield & Massey; 2, Dean & Hodgetts (Tamworth); 3, R. Clark (Pelsall); 4, Attwood & Williams (Rubery). A.O.V. Cichlid: 1, P. T. Roberts; 2, Attwood & Williams (Rubery); 3, T. Hughes (S.S.A.S.); 4, K. Hall (G.K.N.). Fighters: 1, G. Brookhouse (Gornal); 2, J. Salisbury (Bedworth); 3, D. Penwright (G.K.N.); 4, N. Furness (Rubery). A.O.V. Anabanoids: 1, C. Pratt (Bedworth); 2 and 3, T. Saunders (G.K.N.); 4, T. Lowe (G.K.N.). Catfish: 1 and 3, G. Turner (Pelsall); 2, Attwood & Williams (Rubery); 4, K. Brunt (N.S.A.S.). A.O.V. Catfish: 1, Whitfield & Massey (Rubery); 2, Attwood & Williams (Rubery); 3, R. Shakespeare (Dudley); 4, G. Brookhouse (Gornal). Loaches: 1, G. Turner (Pelsall); 2, Dean & Hodgetts (Tamworth); 3, R. Shakespeare (Bedworth); 4, W. Whalan (N.S.A.S.). Killifish: 1, Dean & Hodgetts (Tamworth); 2 and 3, R. J. Farmer (Wednesbury); 4, J. Salisbury (Bedworth). Rasbora: 1, Attwood & Williams (Rubery); 2, J. Salisbury (Bedworth); 3, Dean & Hodgetts (Tamworth); 4, K. Done (Pelsall) Danio W.C.M.M.: 1 and 2, T. Saunders. (G.K.N.); 3, K. Buxton (G.K.N.); 4, F. Clarke (Pelsall). A.O.V. Tropical: 1, J. Salisbury (Bedworth); 2, R. Harlow (Derby Regent); 3 and 4, K. Done (Pelsall). A.V. Tropical Egg Breeders: 1, J. Salisbury (Bedworth); 2, H. Wilson (Independent); 3, J. A. Clayton (Lucas); 4, H. Carr (N.S.A.S.). A.V. Livebearer Breeders: 1, Mrs. B. Hall (S.S.A.S.); 2, Mr. Tallin (Bedworth); 3, H. Carr (N.S.A.S.); 4, B. Wharton (Gornal). Pairs (Egglayers): 1, R. North (Pelsall); 2, A. Carr (N.S.A.S.); 3, Dean & Hodgetts (Tamworth); 4, Attwood & Williams (Rubery). Pairs (Livebearers): 1 and 2, Attwood & Williams (Rubery); 3 and 4, C. Pratt (Bedworth). A.V. Plants: 1, Mrs. J. Goodman (Gornal); 2 and 3, G. Brookhouse (Gornal); 4, R. Mason (Dudley). Single Tail Goldfish: 1 and 4, R. Shakespeare (Bedworth); 2, D. Penwright (G.K.N.); 3, V. Yarnold (G.K.N.). Twin Tail Goldfish: 1, J. Salisbury (Bedworth); 2, H. Carr (N.S.A.S.); 3 and 4, R. Shakespeare (Bedworth). Junior A.V. Tropical: 1 and 3, P. Barnett (Independent); 2, N. Furness (Rubery); 4, B. Payne (Gornal). A.V. Tropical: 1, Mrs. Hughes (S.S.A.S.); 2, Joyce Saunders (G.K.N.); 3, Mrs. Williams (Rubery); 4, Mrs. P. Hall (G.K.N.). Tropical Marine: 1 and 2, H. Tonks (G.K.N.); 3, Mr. Fleetwood (Gornal); 4, J. Vickerry (Dudley). Native Marine: 1, R. Edwards (B.M.A.A.); 2, T. Carroll (B.M.A.A.). Best Fish in the Show: G. Turner's Catfish.

* * *

THE results of the Table Show at the **Bishops Cleeve A.S.** June meeting were: Coradoras: 1, 2 and 4, M. Bishop; 3, P. Greenwood. A.O.V. Cichlids: 1, 3 and 4, M. Bishop; 2, C. Fletcher. The entertainment for the evening was in the form of a Slide Show on "Livebearers," which was appreciated by all members. The Society meet at the Labour Club, Royal Crescent, Cheltenham (visitors welcome) on the first Wednesday of each month.

THE **British Killifish Association** have the following tape and slide shows available: Top and Switch Spawners; Pearl Divers; Soil Spawners; Rivulus Species; Killifish Egg Development; Fish House Construction; Trip to Ghana. All enquiries, with S.A.E., regarding the above shows should be addressed to Services Secretary, B.K.A., Mr. F. Bolton, "Highcroft," 11 Hill Street, Upper Gornal, Dudley, Worcs., DY3 2DE.

* * *

THE **Sittingbourne A.S.** held their second home Table Show recently in the K.A.A.S. inter-club competition. The contending society was Tonbridge A.S. for classes E (Labyrinth) and J. (Rasbora). The results were as follow: Class E: 1, B. Simmonds (Sittingbourne); 2, B. Newman (Sittingbourne); 3, A. Sharp (Sittingbourne); 4, Mrs. A. Newman (Sittingbourne). Class J: T. McDonald (Sittingbourne).

* * *

THE Annual Show of **Llantwit Major A.S.** was an outstanding success with a record number of entries. Results: Barbs: 1, D. A. Brooks; 2, J. H. Jackson; 3, E. H. Chatfield; 4, G. M. Haskins. Characin: 1, F. Willis; 2, Mr. and Mrs. M. H. Medway; 3, H. Armitage; 4, F. Grant. Hemn., Hyphs., Cheirodon: 1, R. Onslow; 2, Ian Clark; 3, H. S. Pratt; 4, Mr. and Mrs. M. H. Medway. Cichlids: 1 and 2, F. Willis; 3, J. Dickinson; 4, S. Freemantle. Labyrinths: 1, S. H. Parrish; 2, H. S. Pratt; 3, J. H. Jackson; 4, C. R. A. Fisher. Toothcarps: 1, M. E. Cott; 2, J. H. Jackson; 3, A. P. Constantine; 4, M. Collins. Tropical Catfish: 1, M. J. Abraham; 2, J. Dickinson; 3, J. H. Jackson; 4, J. Edwards. Corydoras and Brochis: 1, K. H. Taylor; 2, H. S. Pratt; 3, M. Alexander; 4, R. F. Adams. Rasbora: 1, M. H. Medway; 2, H. Armitage; 3 and 4, D. Parkes. Danio and W.E.M.M.: 1 and 2, J. Edwards; 3, A. G. Hillier; 4, J. V. Jeffery. Loach: 1, D. and S. Jackson; 2, S. Ward; 3, A. C. Tull; 4, R. F. Adams. A.O.S. Tropical Egglayers: 1, A. Layton; 2, R. T. Hemmings; 3, M. J. Turner; 4, G. M. Haskins. Pairs: 1, R. Gale; 2, M. Alexander; 3, A. J. Smith; 4, H. Armitage. Guppy (Male): 1, J. Scott Morgan; 2, 3 and 4, C. Beers. Swordtail: 1, A. Loveday; 2, D. Parkes; 3, I. Clarke; 4, A. Ford. Platy: 1, R. F. Adams; 2, H. S. Pratt; 3, R. F. Saville; 4, R. Onslow. A.O.S. Livebearer: 1, R. Onslow; 2, L. A. Little; 3, M. Alexander; 4, R. T. Hemming. Singletail Goldfish: 1 and 4, B. Coombes; 2 and 3, R. F. Adams. Twintail Goldfish: 1, Misses D. and S. Jackson; 2, E. Leavey. A.O.S. Coldwater: 1 and 4, Miss D. Hoppenbrouwes; 2, R. Travers; 3, H. S. Pratt. Breeders Tropical Egglayers: 1, G. E. Dixon; 2, F. Willis; 3, K. E. Taylor; 4, Mr. and Mrs. M. H. Medway. Breeders Livebearers: 1 and 2, L. G. Little; 3, A. J. Smith; 4, J. Scott-Morgan.

* * *

AN interesting demonstration was given by Colin Shipman of Grantham and District A.S., on the construction of all-glass tanks, at the June meeting of the **Gainsborough A.S.** Most members had to admit that they had learned some new tricks about a job they had always thought simple. Results of the monthly Table Show were as follow: Large Characins: 1 and 3, Mr. and Mrs. W. D. Gilding; 2, Mr. and Mrs. P. Dixon. Small Characins: 1, R. Varney; 2, Mr. and Mrs. M. Arrand; 3, Mr. and Mrs. W. D. Gilding. Minnows and Danios: 1, Mr. and Mrs. R. Harris; 2, Mr. and Mrs. Gilding; 3, J. Barnett. Juniors—Large Characins: 1 and 2, G. Gilding. Small Characins: 1, 2 and 3, G. Gilding. Minnows and Danios: 1, G. Gilding. The Society meets on the third Thursday of each month at the "Horse and Groom," Gainsborough, at 7.30 p.m., and new members would be made very welcome.

* * *

EARLY in June the **Caterham Nomad A.C.** had a very interesting show of slides taken at various open shows. These were compered by Pete Ginger, whose slides they were. There was another slide show in June. This was rather an unusual one about the inmates of Indiana State Prison about what one can do in a confined space.

* * *

AT the June meeting of **New Forest A.S.** a lively general discussion was held on ways to improve the running of the Society, and suggestions how to increase membership. Also efforts were made to increase members' interest in showing their fish at more local open shows. The Table Show results were: A.V. Guppy: 1, R. Rowe. Shubunkins: 1 and 3, R. Travers; 2, L. Menhennett. For details of membership, etc., please write to the secretary: R. Travers, 6 Auckland Avenue, Brockenhurst, Hants, SO4 7RS.

* * *

THE June meeting of the **Bristol A.S.** was taken up by a Table Show. Veiltails and Moors representing the coldwater, and Catfish and Loaches the Tropical sides of the hobby. While the judging was in progress a question and answer session provided the entertainment. The questions ranged from the subject of first food for coldwater fry to the reasons for the reluctance of males to chase during warm weather. S. Tibble, an out-of-town member of the Society, caused an interesting discussion when he asked if anyone had had any success with the breeding and keeping of Daphnia.

* * *

THE committee for **Huddersfield T.F.S.** is now as follows: Chairman, N. R. Gibson; vice-chairman, J. Burton; secretary, C. Woolnough, 1087 Manchester Road, Linthwaite, Huddersfield; show secretary, D. Hough; treasurer, D. Hanrop; magazine editor, Mrs. J. Walker; catering officer, Mrs. S. Gibson; committee, S. Birtley, Miss S. Robinson.

* * *

IN April, the **Reigate and Redhill A.S.** received a return visit from the Nomads of Caterham, for an inter-club table show. Classes were: Labyrinths, A.O.V. Livebearers, Corydoras and Brochis, and Characins. Nomads achieved a clear win over the home team. At the following meeting, L. Dixon and S. Perham, alias "Woodland Productions," provided a peeview of their newly-made slide and tape lecture, "Let's Chat about Furnished Aquaria," which appeared to go down very well. This was followed at a later date by attempts to set up small furnished aquaria, under the eye of an expert, W. Leach. Unfortunately there appeared to be somewhat of a plant shortage, and the contents of some of the tanks were novel, aquatic wise, to say the least. The latest meeting was again an inter-club, this time being a visit by a comparatively new club, Haslemere. While judging took place, D. Park talked about the chemistry of water, and the two societies had some interesting comparisons drawn on their differing water supplies. The show classes were Dwarf Cichlids, A.O.V. Catfish, Corydoras and Brochis, and Barbs. This time Reigate came out on top.

* * *

MEMBERS of the **Privateers A.S.** (Shipley) were entertained in June with a splendid lecture by J. Hemmingway, of Batley, on the subject of breeding Emperor Tetras. His great knowledge was a revelation and most helpful.

* * *

OFFICERS elected at the **Cardiff A.S.** annual meeting were as follow: Chairman, C. Harding, 168 Pearl Street, Roath, Cardiff; vice-chairman, R. Daws; secretary, Mr. and Mrs. D. Scanlon, 4 Llwyn-Celyn, Pantmawr Road, Whitchurch, Cardiff; show secretary, Mrs. P. Harding. New members and visitors are welcomed to monthly meetings at The Ruperra, City Road, Cardiff, in the upstairs room, on the last Thursday of each month.

* * *

RECENT activities of the **Wrexham T.F.S.** have included a slide show and a display of model tableaux made by members: R. Mathers' model of a big wheel was voted the winner. A team quiz organised by Mr. D'Arcy, with all the members taking part, was won by the "A" team under the captaincy of Brett Roberts, beating the "B" team (Terry Pound's) on the post. The fish show, judged by C. Pritchard, brought the juniors out in force, and they swept the board in the Danios class with David Jones coming first, and Brett Roberts filling second and third places. Other results were: Rasboras: 1, G. Roberts; 2 and 3, T. Pound. Minnows: 1, 2 and 3, E. Jones.

* * *

AT the June meeting of the **Brighton and Southern A.S.** D. Soper of Mid-Sussex A.S. gave a very interesting talk on breeding some of the more difficult fishes and setting up a breeding tank for the junior members. The judge for the evening was C. West of Mid-Sussex A.S. The results were as follow: Danios, Rasboras and W.C.M.M.: 1, V. Aldis; 2, 3 and 4, B. Rice. Barbs: 1, V. Aldis; 2, J. Cooper. Meetings are held on the first Monday in the month. Old and new members are welcome. Enquiries to Steve Feek, 55 Newmarket Road, Brighton. Tel. 682037.

* * *

IN March, the **British Aquarist Study Society** held their first meeting of the year at the Zoological Society headquarters, Regent's Park. Dr. David Scott of St. Andrews University gave an excellent, illustrated talk on the Bony-tongued Fishes of Asia and America. He made special reference to his study of their reproductive organs, and a stimulating discussion session followed his talk. There was an attendance of well over a hundred and a visit behind the scenes at the Zoo Aquarium finished a very successful meeting. A special meeting for members only was held in June at the Ratcliffe-on-Soar Power Station. The C.E.G. Board is carrying out research work on aquatic environmental studies and there were films and talks on this work. Members found the results of this research concerning fish growth of special interest. The group were shown around the power station and the meeting ended with tea at the home of Mr. and Mrs. J. Williams, B.A.S.S. members.

* * *

IN June, the election of the new committee of the **Derby Regent A.S.** was held. The elected officers being: President, R. Tench of Oldham; it was proposed that the vice-president be Councillor G. Guest; chairman, R. Bull; vice-chairman, J. Bland; treasurer, T. Jerram; general secretary, D. Robertson; assistant secretary, Mrs. N. Robertson; show secretary, R. Harlow; assistant show secretary, T. Bullock; entertainments officer, Mrs. Newton; magazine editor, R. Holmes; assistant editor, Mrs. N. Robertson; librarian, Mrs. Ford; auditors, W. Thompson and P. Kendrick. The first event on the Derby Regent A.S. calendar was at the Derby County Show, where a very successful exhibition of tropical fish was held, including large piranha, black shark, blind cave fish and many others. A highlight of the exhibition was a country cottage setting surrounded by plants and shrubs and in front of the cottage was a large pond filled with goldfish, and to add a final touch, a fountain in the centre.

* * *

THE June meeting of the **Weymouth A.S.** was attended by thirty members. After club business was finished, members listened to a talk on "Safe Electrics" by B. Cornick of Dorchester. Mr. Cornick, in his talk, dealt especially with how to wire a tank with maximum safety.

Table show results were as follows: A.O.S. Characins: 1, G. Fitzgerald; 2, A. Cox; 3, K. Abrahams. H.H. and C.: 1, Mrs. P. Carter; 2, R. Hart; 3, A. Worth.

* * *

MEMBERS of the **Dunmow and District A.S.** heard a talk recently from B. Pye of Brentwood on plants. He also judged the mini furnished aquaria. The results were as follows: 1, Mrs. E. Andrews; 2, M. Green; 3 and 4, J. Farlow.

* * *

RESULTS at **Loughborough A.S.** open show were as follow: Fighters: 1, F. Underwood (Spa Discussion); 2, Mr. Gillespie (Castleford); 3, K. Bates (Hinckley). A.O.V. Anabantids: 1, R. Shakespeare (Bedworth); 2, E. Pratt (Bedworth); 3, J. A. Clayton (Lucas). Small Barbs: 1, B. Jeffs (A.A.J.A.S.); 2, K. and H. Blades (Cresswell); 3, A. Clarke (Hinckley). A.O.V. Barbs: 1, A. Barrett (Castleford); 2, J. Salisbury (Bedworth); 3, M. Bates (Hinckley). Small Cichlids: 1, Mr. Gillespie (Castleford); 2, Mr. Williams (Rubery Select); 3, L. Garside (Lucas). Angels: 1 and 2, Mr. and Mrs. Bull (Cresswell); 3, Mr. Montgomery (Independent). A.O.V. Cichlids: 1, R. Tedds (Bedworth); 2, Mr. and Mrs. Shipman (Grantham); 3, K. and H. Blades (Cresswell). Danios and W.C.M.M.:

1, A. Bull (Derby Regent); 2, T. Hughes (S.A.S.S.); 3, T. Saunders (G.K.N.). Rasboras: 1, H. Richardson (Ladas); 2, K. Pratt (Bedworth); 3, Mr. Tomlinson (Chesterfield). Corydoras and Bronchis: 1, Mr. Williams (Rubery Select); 2, K. Brent (N. Staffs); 3, B. C. Roberts (Independent). A.O.V. Catfish: 1, Mr. Massey (Rubery Select); 2, C. Sadler (Rubery Select); 3, C. Pratt (Bedworth). A.O.V. Tropical: 1, T. Parry (Ladas); 2, C. Pratt (Bedworth); 3, Mr. Massey (Rubery Select). Guppies: 1, Mr. Gillespie (Castleford); 2, Mr. and Mrs. Foster (Cresswell); 3, Mr. and Mrs. Carter (Bedworth). Small Characins: 1, R. S. Elliott (Corby); 2, Mrs. C. Bull (Cresswell); 3, Mr. Williams (Rubery Select). Best in Show, 1, B. C. Roberts (Independent); 2, R. Tedds (Bedworth); 3, R. Harlow (Derby Regent). Livebearer (Pairs): 1, T. Allen (Bedworth); 2, B. and F. Hirst (Coventry); 3, T. Saunders (G.K.N.). Egglayer (Pairs): 1 and 3, B. C. Roberts (Independent); 2, D. Stone (Chesterfield). Egglaying Toothcarps: 1, T. Allen (Bedworth); 2, B. and F. Hirst (Coventry); 3, Mr. and Mrs. Bull (Cresswell). A.V. Loach: 1, R. S. Elliott (Corby); 2, H. Brainsbridge (A.A.J.A.S.); 3, D. White (Bedworth). A.O.V. Livebearer: 1, Mr. and Mrs. Bull (Cresswell); 2, Mr. and Mrs. Gabe (Chesterfield); 3, R. Shakespeare (Bedworth). Livebearer Broods: 1, D. White (Bedworth); 2, T. Allen (Bedworth); 3, J. Furness (Castleford). Egglayer Broods: 1, J. Hall (Independent); 2, K. and H. Blades (Cresswell); 3, B. and F. Hirst (Coventry). Singletail Goldfish: 1, F. E. Watts (Coventry); 2 and 3, R. Shakespeare (Bedworth). Twintail Goldfish: 1 and 3, N. Giles (Leicester); 2, J. S. Salisbury (Bedworth). A.O.V. Coldwater Pond or River Fish: 1, C. Pratt (Bedworth); 2, P. Watts (Coventry); 3, F. E. Watts (Coventry). Best Fish in Show: Distichodus Sexfasciatus, owned by B. C. Roberts.

* * *

THE July meeting of the West Midland Group of the **British Marine Aquarist Association** began with members' opinions of the film "The Great Barrier Reef". It was agreed by all members that this is one of the finest films they had seen on Marine Life. The West Midland Group now has a new chairman, Roger Pearson, BMAA 340, as H. Tonks the previous chairman has had to leave owing to his work. As from September, there will be films and slide shows each month. The slide show for September is of a "Natural Set-up". In this set-up the all-glass tank alone is 8ft. long. The West Midland Group will again be at Bingley Hall this year. There will be two 36in. × 15in. × 15in. all-glass tanks—one for Tropical Marines and one for Native Marines. The night ended with a fresh item, the new chairman bringing along some lizards.

* * *

SOME 45 members and visitors attended the June meeting of the London and South-East Regional Group of the B.M.A.A. at Regent's Park. Guest speakers included Graham Cox (President) and John Vickery (national secretary). Two films were screened, one of them, "Between the Tides" being an award winning film from British Rail. A behind the scenes visit to London Zoo Aquarium arranged for September was well supported. The following officers were elected or confirmed in their appointments: Bruce Wilkinson, Secretary; Peter Ireland, assistant secretary; Graham Cox, Group P.R.O. Nominations for further officers are expected shortly.

A public relations stand mounted by the L.&S.E. Group was set up at the Basingstoke and District A.S. open show, and included a furnished Tropical marine aquarium and Native marine tank. The substantial number of native marines, including many varieties of fish and invertebrates were supplied by L.&S.E. members and Lewis Doubleday, secretary of the South Western Group who was attending the show to judge the marine entries. Dave Parham, a youthful S.W. member also scored his first successes in the marine class

* * *

AT the June meeting of the **Suffolk Aquarists and Pondkeepers Association**, the members were treated to a superb evening of entertainment, conducted by F.B.A.S. man, Bernard Pye, who successfully undertook a most interesting and informative slide-show/quiz.

* * *

ENTRIES at the **Northwich and District A.S.** Open Show totalled 409 and the results were as follow: Guppies: 1, R. Darby (Hyde); 2, P. Hall (Runcorn); 3, C. and R. Davies (Northwich). Swordtails: 1, P. Walker (Northwich); 2, A. Darby (Hyde); 3, R. Knowles (Northwich). Mollies: 1, Mr. Perkin (Macclesfield A.S.); 2, B. W. Carter (Merseyside); 3, K. Atherton (Grimwood). Platies: 1, B. and C. White (Leigh); 2, W. D. Haddow (Hyde); 3, R. Knowles (Northwich). Small Barbs: 1, K. Wright (Sandgrounders); 2, B. and C. White (Leigh); 3, T. Sinclair (Northwich). Large Barbs: 1, B. W. Carter (Merseyside); 2, R. I. Payne (Merseyside); 3, L. and D. Thorne (Northwich). Small Characins: 1, L. and D. Thorne (Northwich); 2 and 3, B. Sumner (Sandgrounders). Large Characins: 1, B. and B. Booker (Morecambe); 2 and 3, R. Walker (Morecambe). Fighters: 1 and 2, L. Ratcliffe (Leigh); 3, R. Weedon (Merseyside). Small Anabantids: 1, Miss G. Gullane (Buxton); 2, D. Taylor (Macclesfield F.C.); 3, Clarke Bros. (North Staffs.). Anabantids A.O.V.: 1, P. S. Gudgeon (Hyde); 2, R. Harlow (Derby Regent); 3, S. Hooton (Sandgrounders). Angels: 1, G. Wilkinson (Hyde); 2, C. Bull (Derby Regent); 3, M. D. Valentine (Northwich). Dwarf Cichlids: 1, W. D. Haddow (Hyde); 2, Miss J. Gullane (Buxton); 3, L. and D. Thorne (Northwich). Cichlids A.O.V.: 1 and 3, S. Hooton (Sandgrounders); 2, G. Wilkinson (Hyde). Danios and Minnows: 1, P. Floyd (Northwich); 2 and 3, L. and D. Thorne (Northwich). Rasbora: 1, L. Bradley (Northwich); 2, T. Sinclair (Northwich); 3, B. and B. Booker (Morecambe). Sharks: 1, R. Harlow (Derby Regent); 2, Mrs. D. T. Armour (Ellesmere Port); 3, T. Hampton (Merseyside). Flying Foxes: 1 and 2, J. Hall (Runcorn); 3, Miss J. Gullane (Buxton). Catfish-Corydoras: 1, B. and C. White (Leigh); 2, Miss J. Gullane (Buxton); 3, Clarke Bros. (North Staffs.). Catfish A.O.V.: 1, Mrs. D. T. Armour (Ellesmere Port); 2, A. Waterhouse (Sandgrounders); 3, L. and D. Thorne (Northwich). Loaches and Botias: 1, R. Walker (Morecambe); 2, Mr. and Mrs. Pritchard (Wrexham); 3, K. Thomas (Lucas). Toothcarps: 1, 2 and 3, T. Sinclair (Northwich). A.O.V. Tropical: 1, Mr. Atherton (Grimwood); 2, G. Taylor (Macclesfield F.C.); 3, A. Waterhouse (Sandgrounders). Livebearers (Pairs): 1, B. Sumner (Sandgrounders); 2, H. Buckley (Northwich); 3, G. Kaye (Top Ten). Egglayers (Pairs): 1, B. and C. White (Leigh); 2, Mrs. C. Bull (Derby Regent); 3, R. Knowles (Northwich). Breeders (Livebearers): 1, A. Waterhouse (Sandgrounders); 2, Miss B. Kaye (Top Ten); 3, R. Knowles (Northwich). Breeders (Egglayers): 1, Mr. and Mrs. A. Thomas (Independent); 2 and 3, F. Thorne (Village). Goldfish (Common): 1, Mr. and Mrs. Brearly (Village); 2 and 3, B. J. Holroyde (Morecambe). Goldfish (Fancy): 1, M. Whalan (North Staffs.); 2, H. Buckley (Northwich); 3, A. Thorne (Northwich). Coldwater A.O.V.: 1, L. and D. Thorne (Northwich); 2, Clarke Bros. (North Staffs.); 3, Mr. Atherton (Grimwood). Junior Livebearers: 1, Mrs. D. Holroyd (Morecambe); 2, G. Wilkinson (Hyde); 3, Miss S. Goddard (Macclesfield A.S.). Junior Egglayers: 1, Mrs. W. L. Booker (Morecambe); 2, Master A. Wild (Accrington); 3, Master E. Armour (Ellesmere Port). Furnished Mini-Jar: 1, Mrs. A. Wild (Accrington); 2, A. Wild (Accrington); 3, L. and D. Thorne (Northwich).

* * *

FIFTEEN F.B.A.S. affiliated Societies took part in the annual inter-club show, organised by **Portsmouth A.S.**, on Spring Bank Holiday Sunday. The following participated: Basingstoke, Brighton, Freelance, Gosport, Havant, Kingston, Littlehampton, Newbury, New Forest, Portsmouth, Reading, Roehampton, Salisbury and Southampton. Class results were as follows: Class B: 1, Basingstoke; 2, Roehampton; 3, Salisbury; 4, Kingston. Class C: 1, Southampton; 2, Gosport; 3, Basingstoke; 4, Havant. Class D: 1, Havant; 2, Freelance; 3, Portsmouth; 4, Roehampton. Class E: 1, Salisbury; 2, Kingston; 3, Roehampton; 4, Basingstoke. Class F: 1, Salisbury; 2, Gosport; 3, Newbury; 4, Kingston. Class G/H: 1, Basingstoke; 2, Roehampton; 3, Gosport; 4, Newbury. Class J/K: 1, Roehampton; 2, Havant; 3, Portsmouth; 4, Salisbury. Class L/M: 1, Newbury; 2, Basingstoke; 3, Havant; 4, Southampton. Class O-T: 1, Roehampton; 2, Brighton; 3, Basingstoke; 4, Kingston. Class U: 1, Portsmouth; 2, Salisbury; 3, Roehampton; 4, Littlehampton. Class V: 1, Reading; 2, Portsmouth; 3, Basingstoke; 4, Kingston. Class W: 1, Portsmouth; 2, Roehampton; 3, Basingstoke; 4, Havant. The final placings were: Roehampton 22 points, and winners of the shield, Basingstoke 20 points, Portsmouth 15 points, Salisbury 14 points, Havant 11 points, Gosport 8 points, Kingston 7 points, Newbury 7 points, Southampton 5 points, Reading 4 points, Freelance 3 points, Brighton 3 points, Littlehampton 1 point, and New Forest 0. While the fish were being judged by R. D. Eisen, F.B.A.S., P. Ginger, F.B.A.S., and I. Mathirson, F.B.A.S., a programme of films was shown. These included that extremely interesting film made for the B.B.C. Horizon programme, "Making a Natural History Film".

The Portsmouth A.S. look forward to again welcoming many of these societies at their 21st annual open show, at the new venue, at St. Patricks Hall, Winter Road, Southsea, Portsmouth, 4th to 11th August. Schedules are available from show secretary, J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, PO3 6LD.

* * *

BRITISH KILLIFISH ASSOCIATION

As from 1st September all enquiries regarding membership and renewal should be sent to the new registrar or the secretary. Details are as follow: Registrar, P. K. Brown, "Rushen," Elm Grove, Eccleston Park, Prescot, Lancs., L34 2RX. Secretary: W. Devision, 2 Shaw Road, Tipton, Staffs., DY4 7GA.

* * *

VENUE CHANGE

Future meetings of the **United A.S.** will be held at Winchester Road Methodist Church, Highams Park. Details phone 01-556 6404.

* * *

SECRETARY CHANGES

Wrexham T.F.S.: B. Jones, 2 Parkfield, Gresford Park, Gresford, Nr. Wrexham, Denbighshire, LL12 8HT.

Barrow and District A.S.: J. B. Newman, 3 Lyndale Ave., Barrow-in-Furness, Lancs.

South Derbyshire and District A.S.: P. Yates, Ivy Villa, Abbots Road, Newhall, Burton-on-Trent.

Trowbridge and District A. & P.K.S.: Mrs. Peggy Pearce, 69 Alfred Street, Westbury, Wilts.

Ilford and District A. & P.K.S.: M. Shadrack, 61 St. Barnabas Road, Woodford Green, Essex.

Exmouth and District A.S.: Mrs. Penny Stevens, 42 Holland Road, Exmouth, EX8 4BA.

Goldfish Society of Great Britain: Mrs. M. Dudley, 163 South Park Road, Wimbledon, London, SW19 8RX.

Macclesfield A.S.: W. D. Preston, 38 Chester Road, Macclesfield, Cheshire. Phone: Macclesfield 27018.

* * *

SHOW CANCELLATION

The **Macclesfield Aquarium Society** regret that due to circumstances beyond their control the Open Show scheduled for the 9th September, has had to be cancelled. It is hoped to hold the open show early next year.

* * *

AQUARIST CALENDAR

5th August: Blackpool and Fylde Open Show. The venue is the Norbreck Castle Hotel, Norbreck, nr. Blackpool.

5th August: Tonbridge and District A.S. F.B.A.S. and K.A.A.S. second Open Show at Tonbridge School, Tonbridge, Kent. Show schedules from show secretary, I. T. Mathieson, 33 Norsons Way, Fire-Oak-Green, Tonbridge, Kent.

6th-11th August: The Portsmouth A.S. Annual Open Show at St. Patrick's Hall, Winter Road, Southsea, Portsmouth. Setting up day will be

Saturday 4th August, judging on the 5th. Show schedules are obtainable from J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, Hants.

12th August: Grimsby and Cleethorpes A.S. second Open Show at the Memorial Hall, Cleethorpes. Schedules can be obtained from the Show Secretary, T. P. Walker, 51 Cheatre Walk, Willows Estate, Grimsby, Lincs.

12th August: North Staffs. A.S. Open Show at Cobridge Drill Hall, Waterloo Road, Cobridge, Stoke-on-Trent. F.N.A.S. rules. Details: K. Ankers, 4 Castle Street, Chesterton (phone 739 564409), or J. S. Booth, 536 Beverley Drive, Bentilee, Stoke-on-Trent, Staffordshire.

15th-18th August: Midland Aquarium and Pool Society, Bingley Hall, Birmingham.

18th-19th August: Harwich and District A.S. Annual Show to be held at The Queens Hotel, Dovercourt High Street.

19th August: Huddersfield T.F.S. Annual Open Show, Paddock Civic Youth Club, Beech Street, Paddock, Huddersfield.

19th August: Valley A.S. Open Show to be held at Civic Hall, Ramsbottom. Show secretary, M. Berry, 8 Leyland Street, Blackford Bridge, Bury, Lancs. Tel: 061-766 8574.

19th August: Stroud & District A.S. Open Show. Mid Gloucestershire Technical College, Stratford Road, Stroud, as last year. Show Secretary: Mrs. D. Cole, The Hill, Randwick, Stroud.

19th August: Creswell and District A.S. second Annual Open Show at the Worksop Sports Centre, Valley Road, Worksop, Notts. Show secretary Mrs. R. Foster, 15 Hemmingfield Crescent, Worksop, Notts.

19th August: Bedworth Aquarist and Pool Society fifth Open Show at Nicholas Chamberlaine School, Bulkington Road, Bedworth. All details available from show secretary, J. Housden, 7 Tamar Road, Bulkington, Bedworth, Warwicks.

25th August: Plymouth A.S. fourth Open Show at Y.M.C.A., Armada Way, Plymouth. Schedules from: M. Leeder, 3 North Down Gardens, Keyham, Plymouth.

26th August: Fleetwood A.S. First Show at The Fleetwood Grammar School, Poulton Road, Fleetwood.

26th August: Great Yarmouth and District A.S. Tropical Fish Exhibition 73. All welcome to exhibit at North Drive International High School. Details from P.R.O., P. Watson, 31 Common Road, Hemsby, Great Yarmouth, Norfolk.

26th August: Fifth Annual East of Scotland Club and Society Show. The venue is the Music Hall, Union Street, a central and easily accessible point. Entries, in any of 28 classes, will be accepted from 11 a.m. to 1.30 p.m. The classes include breeders' teams, also Rift Valley Cichlids. Only members of East of Scotland Aquarium Clubs or Societies will be eligible to enter fish. Full details of schedule, entry forms, map of Aberdeen, etc., are obtainable from G. Ross, 1 Gairnshiel Place, Aberdeen (tel. Aberdeen 493946), or through the secretary of any East of Scotland club or society.

2nd September: Thorne A.S. Annual Open Show.

2nd September: Lucas Pool and Aquarium Pool Society 3rd Open Show at same venue as last year: Spring Road, Birmingham. Schedules from: Show Secretary, K. Thomas, 11 Alston Road, Solihull, Warks.

2nd September: Bethnal Green A.S. Open Show, Bethnal Green Institute, 229 Bethnal Green Road, London, E.2. F.B.A.S. Supreme Championship Trophy class Cx (Large Characins). Schedules and further details from: Mrs. S. Hedges, "Koi Korner," 150 Ashburton Ave., Seven Kings, Ilford, Essex, IG3 9EL. Phone: 01-590 3239.

2nd September: Morecambe Bay A.S. Second Open Show to be held at the Ambulance Hall, Alice Street, Morecambe.

8th September: Three Counties Group Annual Open Show. Show secretary, John Horsey, 4 Rickman Close, Woodley, Reading, Berks.

8th September: Penarth A.S. Open Show will be held at St. Augustine's Church Hall, Penarth.

9th September: Nuneaton A.S. Sixth Open Show.

9th September: Newbury and District A.S. Open Show. Full details later.

9th September: Barnsley T.F.S. Ninth Annual Open Show at The Mapplewell, Staincross Village Hall.

9th September: One Day Open Show Harlow A.S., at Moot House, Harlow. Show Secretary: Steve Jordan, 48 Whitewaits, Harlow, Essex.

9th September: Peterlee A.S. 11th Open Show. Schedules available later from Secretary, A. D. Bebbington, 40 Marlborough Road, Hastings Hill, Sunderland.

9th September: Hoylake A.S. 4th Open Show at the Hoylake Y.M.C.A., Hoylake. Show Secretary, Mr. E. Rowlands, 3 Haigh Avenue, Moreton, Wirral, Cheshire.

11th September: Gainsborough and District A.S. second annual "Mini" Open Show. At the "Blues" Club, Gainsborough. Schedules from: Show secretary, W. D. Gilding, 28 Retford Road, Woodbeck, Notts.

14th-15th September: Bristol A.S. Open Show. All enquiries to E. N. Bowden, 12 Stonehigh Walk, Knowle, Bristol, BS4 2RL.

15th September: Weston-super-Mare and District T.F.S. Fourth Open Show at St. Johns Hall, Oxford Street, Weston-super-Mare. Show manager, J. Clarke, St. Judes, North Street, Cheddar.

15th September: Hounslow and District A.S. Annual Open Show at the Youth Centre, Cecil Road, Hounslow, Middlesex. All enquiries to show secretary H. Pratt, 23 Woodlawn Drive, Feltham, Middlesex. Phone: 01-894 0923.

15th September: Mid-Herts. A.S. Open Show at Birklands Annexe, London Road, St. Albans. All information from A. Lusby (show secretary), 214 Riverside Road, St. Albans, Herts.

16th September: Buxton and District A.S. Third Open Show at the Pavilion Gardens, Buxton. Schedules from the show secretary, A. Holland, 8 Midland Terrace, New Mills, Via Stockport, Cheshire.

16th September: Hastings and St. Leonards A.S. First Open Show, to be held at Concordia Hall, Hastings. Schedules and further information from D. J. Hunt, 239 Mount Pleasant Road, Hastings.

16th September: Grimwood A.S., Skelmersdale, Lancs. Second Annual Open Show to be held at the Quarry Bank Community Centre, Ormskirk Road, Skelmersdale. Details from J. B. Handford, secretary, 55 Thurston, Skelmersdale, Lancs. Tel. 24900.

16th September: West Cumberland Aquarists Club third Open Show.

16th September: Cleveland A.S. Open Show, British Legion Club, High Street, Guisbrough, Yorkshire. Details from B. Welford, 1 Railway Terrace, North Skelton, Saltburn-by-the-Sea, Yorkshire.

22nd September: The Rhondda Aquarists' fifth Open Show will be held at The Central Hall, Tonypandy, Rhondda, Benching 9.00 a.m. to 12.30 p.m. Schedules available mid July. For these and further details please apply to the show secretary: M. Williams, 122 Top Trebanog, Trebanog, Rhondda, Glamorgan. Will everyone please note this is not the usual venue, and the car-parking facilities are excellent.

23rd September: Torbay A.S. Open Show, at the Torquay Town Hall. Show schedules from: J. R. Davis, 8 Barewell Close, St. Marychurch, Torquay, Devon.

23rd September: North Kent Open Show. Schedules and details available later from P. W. Cottle, 2 Challenge Close, Riverview Park, Gravesend. Tel: 0474 63862.

23rd September: Washington A.S. is to hold its 2nd Annual Open Show at the Oval Community Centre, Washington. Details are available from the Show Secretary, Mr. I. Gardner, 95 Westernmoor, Blackfell Village, Washington, Co. Durham. Schedules will be available later.

23rd September: Littlehampton and Bognor A.S. Exhibition, Bognor Regis.

23rd September: The Hucknall and Bulwell A.S. are holding their Annual Open Show at Bulwell Youth Club, Coventry Road, Bulwell, Nottingham. Benching is from 12 noon until 2 p.m. Schedules can be obtained from J. Sutcliffe, show secretary, 273 Wicklow Court, Basford, Nottingham.

23rd September (amended date): Stone A.S. Open Show, Walton Community Centre, Walton, Stone. Show secretary: K. W. Evans, 42 Friars Avenue, Walton, Stone.

23rd September: The Castleford Aquarist Society are holding their first Open Show at the Pontefract Road Boys' Modern School, Castleford.

30th September: Northampton and District A.S. Open Show at the Drill Hall, Northampton. Schedules will be available shortly from G. Allatt, 80 Chiltern Avenue, Northampton.

30th September: Pelsall A.S. second Open Show will be held at the Pelsall Community Centre, Pelsall, nr. Walsall, Staffs. For further details, apply 6 Wilners View, Pelsall, nr. Walsall, Staffs.

30th September: Chesterfield and District A.S. Annual Open Show. Venue Clay Cross Social Centre, Chesterfield Road, Clay Cross, nr. Chesterfield, Derbyshire. Exit 29 off M1. Follow signs four miles to show. The spacious venue is situated on the A61. Benching 12-2.15 p.m. Schedules from D. Stone, 237 North Wingfield Rd., Grassmoor, Chesterfield, Derbyshire, S42 5HR. Tel: Staveley 2775.

30th September: Goodyers-End A.S. first Open Show at St. John Ambulance Hall, Hallbrooks, Coventry. Secretary: R. Hargreaves, 47 Whitburn Road, Bedworth, Warwicks.

30th September: The Irish Tropical Fish Society second Annual Open Show at the Mansion House, Dawson Street, Dublin 2. Schedules from J. P. Naismith, Kilgobbin, Sandyford, Co. Dublin, Ireland.

6th October: East London Aquarist & Pondkeepers' Association Annual Open Breeders Show. Schedules available from The Show Secretary, F. Vicker, 13 Irons Way, Collier Row, Romford, Essex.

7th October: Eboracum Aquarists First Open Show. Acomb Church Hall, Front Street, Acomb, York. Show secretary: W. A. Bunnage, 22 Heathcroft, Fulford, York.

7th October: Hinckley and District A.S. second Open Show at Heathfield High School, Belle Vue Road, Earl-Shilton, Leicestershire. More information from show secretary: T. Saunders, 29 Browning Drive, Hinckley.

7th October: Redcar A.S. first Open Show. Hon. secretary, D. Nagle, 59 Charlotte Street, Redcar, Teeside.

21st October: Sherwood A.S. Open Show, Thoresby Miners Welfare Hall, Edwinstowe, Nr. Ollerton, Mansfield, Notts. Schedules from Show Secretary, Mr. J. Igoe, 25 Marples Avenue, Mansfield, Woodhouse, Notts NG19 9EY. Tel: Mansfield 32249.

28th October: The Newcastle Guppy and Livebearer Society's Open Show will be held at the Gosforth Central Hall, Newcastle-upon-Tyne. Schedules will be available shortly from: Mrs. J. Renton, 128 Dunstan Tower, Garth 18, Killingworth, Newcastle-upon-Tyne, NE12 0TX.

29th October: Doncaster and District A.S. Annual Show at Brodsworth Miners' Welfare, Welfare Road, Woodlands, Nr. Doncaster.

3rd November: G.S.G.B. Quarterly Meeting, 2.30 p.m., Conway Hall, Red Lion Square, Holborn, London. Goldfish for Beginners, Part Four. R. Whittington. The Bristol Shubunkin. L. Emery. Choosing next year's Breeders. Panel. Table Classes. Refreshments available.

4th November: The Mixenden T.F.S. Open Show.

11th November: Hartlepool A.S. Annual Open Show will be held at Longscar Hall, Seaton Carew. Show Secretary: Mr. J. Watson, 42 Sydenham Road, Hartlepool, Co. Durham TS26 9BW.

17th November: K.D.A.S./S.P.A.S.S. third Combined Open Show will be held at the T.A. Centre, Surbiton Road, Kingston, Surrey. Show schedules are obtainable from D. J. Mackay, c/o 51 Mount Road, New Malden, Surrey. Tel: (Day) 01-572 0632; (Night) 01-942 9021.

2nd December: Horsforth A.S. fourth Open Show, New Civic Hall, Stanningley, Pudsey. Show secretary, C. Coens, 15 Thornleigh Grove, Leeds, LS9 8QR.