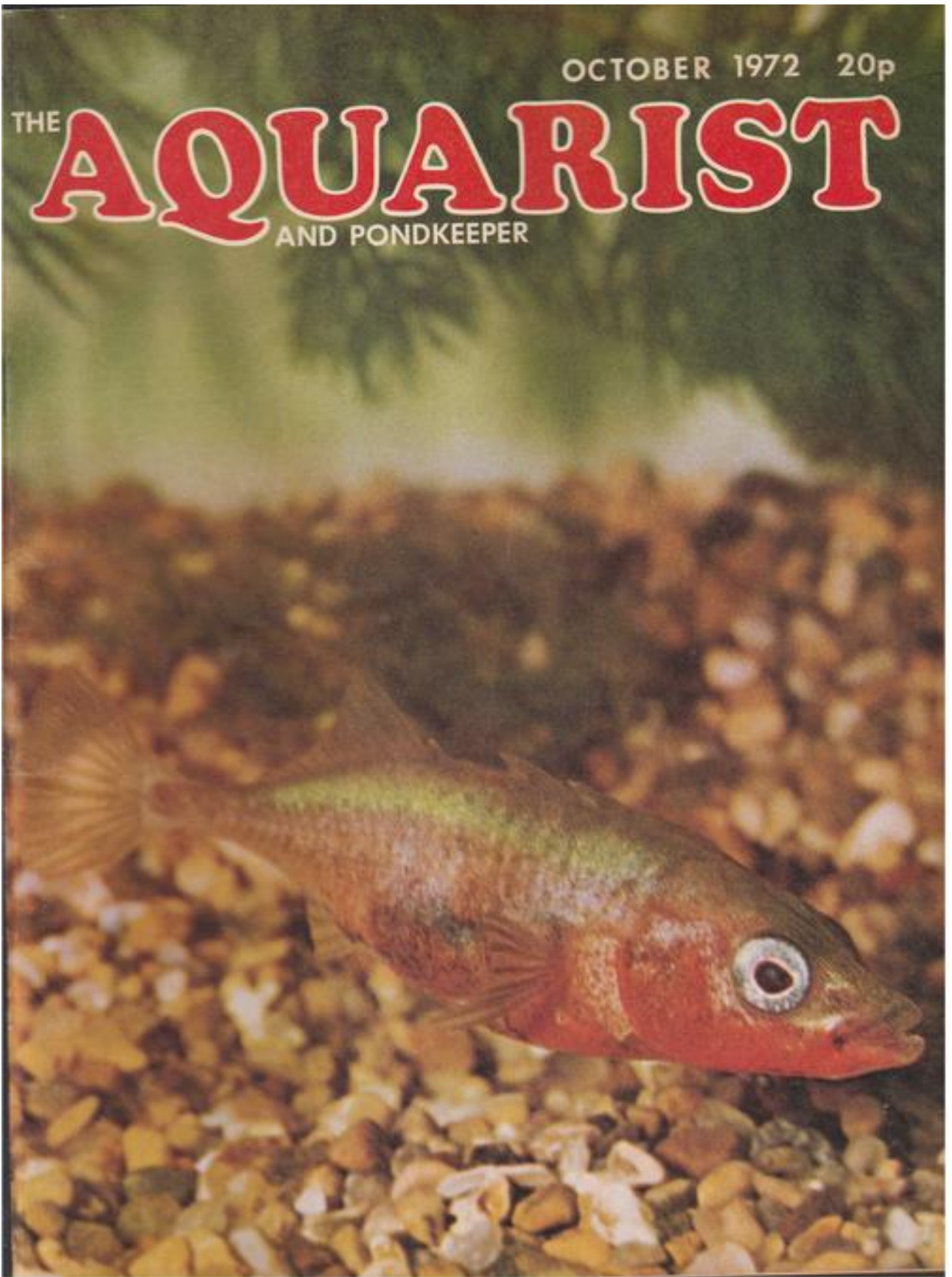


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THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

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Our Cover
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The Editor accepts no responsibility for views expressed by contributors.

WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author



I RECENTLY asked for opinions on the silver-tipped tetra—*Hemigrammus nanus* (photograph 1). Mr. J. C. Sergeant, of 35 Jacey Road, Shirley, Solihull, Warwickshire, agrees that these are most attractive fish, and he has four males and two females which he keeps in a 3ft. tank, along with some baby mollies. They are most lively in his tank, darting all over the place and showing their colours off superbly. (They are certainly always "on the go," and it took me some time before I got a usable photograph of this one!) Mr. Sergeant has no trouble in getting his fish into breeding condition in their permanent tank, but whenever he moves a pair to an 18in. breeding tank—filled with water from the larger tank, planted with *Cabomba*, and maintained at 80°F—the male remains as colourful as ever but the female goes opaque with hardly any colour in her whatsoever. On being returned to the original tank, the female regains her former glory. Both females have reacted thus, but the different males always retain their bright colours. This condition in the females remains no matter how long they are allowed to stay in the breeding tank. Mr. Sergeant wonders if readers have any suggestions as to why the females react in this manner.

Miss L. C. Bough writes from Flat B, 100 Shaw Road, Blakenhall, Wolverhampton, Staffs., and she is a beginner who is flushed with success. Some time ago she bought a pair of three spot Gouramies, and within two weeks the male began to build a bubble nest. Not having a good spare tank available, she used an old goldfish tank, size 15in. x 9in. x 9in., adding some plants of *Cabomba* and the pair of Gouramies. Nothing happened for two hours, but then the male began to blow a new nest, and his colour changed to dark blue. He began to chase the female and the pair went into spawning embraces. After the spawning was completed, the female retired to a flower pot which had been placed in the tank. The eggs hatched in about 48 hours, at 76°F, and the male was kept busy keeping the fry in the nest. The female was removed and the male left to look after the young. Liquifry was used for the babies, for 7-10 days, and the male was fed on white worms and Tetramin. After ten days the young were begun on Tetramin "E" food. As the tank had no filter, it got rather dirty, and Miss Bough regularly siphoned off ½pt. water, replacing it with fresh water at the same temperature. The fry grew steadily, and

then three months old they were moved to a newly bought 24in. aquarium.

She is keeping a pair of the young fish, and the other thirty-one are being bought by her dealer as she has nowhere to keep them. She is very proud of her first attempt at breeding, and feels that it shows that expensive equipment is unnecessary. Miss Bough has now bought a pair of Siamese fighters, and hopes to try breeding these next. She thanks *The Aquarist* for the useful hints and advice which it gives. A new feature which she would like to see would be a monthly series dealing alphabetically with a different species of fish—one per month. (I recently bought an adult pair of Opaline Gouramies, one of which can be seen in photograph 2. What have been your experiences with the keeping and breeding of Opaline Gouramies?)



The next letter comes from Mr. R. O. Cutts, and his home is at 341 Tudor Street, Sutton-in-Ashfield, Notts. He has tried all types of lighting to get good plant growth, and considers that a "white light" or "daylight" fluorescent tube is best; or Gro-Lux along with "a couple of 30 watt clear bulbs." He thinks that lighting is important—but will only give success if the bottom of the tank is correct for growing plants. He always uses a mixture of sand, peat and soil, and suggests that small trifle cases of this mixture can be used for large plants such as Amazon swords, *Aponogeton*, *Cryptocoryne*, etc., if one doesn't want to cover the whole base of a tank.

One of the most attractive fish illustrations which I have yet seen was a coloured painting of the Pearl Gourami photograph shown on the front cover of the June edition of *The Aquarist*. The painting was a copy done by 18-years-old David Kristupas, and it was

sent to me by Mr. R. K. Marriott, of 61 Station Road, Sutton-in-Ashfield, Notts. David is Mr. Marriott's apprentice joiner at work, and Mr. Marriott was so impressed by his collection of paintings that he wondered if I thought that David could possibly further a career as an artist. Having given David the best advice which I could based on only having seen one of his paintings, I feel that many aquarists would be very keen to buy a framed painting, such as the one I saw, as a wall decoration. I hope that David will let me know what progress he makes with his paintings of fishes.

Mr. Marriott's favourite features in this magazine



are W.I.Y.O.? and "Tropical Queries," by Mr. Jack Hems. Mr. Marriott's favourite fish is the Lace Gourami and he cannot understand why most aquarists give their vote to the Dwarf Gourami—of which he has a pair. He considers the most interesting public aquarium to be that at London Zoo, but he also praises the Tropical House at the Marineland at Skegness. He says that its most interesting tank is the one which contains the very large tinfoil barbs.

Mrs. Ceri Findlay and her husband live at 120 Queens Drive, Llantwit Fardre, Pontypridd, Glamorgan, and she and her husband have been keeping tropical fishes for about three years now. They have tried out several different types of fluorescent lighting over their tanks. With Gro-Lux used over a 50gal. tank the plants did not grow very well, so two ordinary tungsten bulbs have now been added as well, and results are awaited. At the moment, Mrs. Findlay's 30gal. tank is lighted by a "daylight" tube, but previously a "warm white" tube was used. Both

tanks have the same water conditions, and both are filtered by undergravel filters, but the plants grow very much better in the smaller tank. Plants taken from the larger tank and placed in the smaller make a rapid improvement, and *Gabomba* grows at a fantastic rate. Little difference was found between either "daylight" or "warm white," but the "daylight" type seemed to promote the growth of *Cryptocoryne* species better than the "warm white." The Gro-Lux will be replaced by a "warm white" tube when it has worn itself out, but the cost of a tube to fit a 4ft. 6in. tank is putting Mrs. Findlay off at the moment. Mrs. Findlay and her husband always feed their fishes on British foods,

mainly because they are cheaper. When the German Tetramin food was used, the fishes seemed to have no particular preference for either, and Mrs. Findlay says that, according to the labels, both makes contain the same ingredients anyway. The British food which she uses is Phillips.

"I see that a lot of people would like *The Aquarist* to be published every fortnight. So would I, except that I could not afford it. I think it should be considered that a lot of people who keep fish are, like myself, O.A.P.'s," writes Mrs. Dorothy A. Hanning, from 11 Seaton Road, Ford, Plymouth. A couple of months ago Mrs. Hanning bought, from a "bargain" tank, a very small fish which she was told was a Convict Cichlid. She says that the fish has only doubled its size, that it has nine grey stripes, the middle one with a large black spot just above the centre line, and that it has another black spot below the eye. At the moment the fish is quite peaceful in a tank of Gouramies, Angels and Swords, etc., but her aquarium book

illustrations suggest that it may be a Jack Dempsey and she is wondering how big it will grow and if it will become obstreperous, because she has nowhere else to put it. Mrs. Hanning ends by asking if any writers on reptiles could give us an article on Iguanas; she ordered one nine months ago but is still waiting for it to arrive. She would like to know about its feeding habits, care, etc. (Can anyone offer any advice or suggestions about Mrs. Hanning's problems?)

Master G. Millman is 14 years old, and he has been keeping fishes for two years. He now has several tanks of tropicals, and a small garden pond stocked with coldwater fishes. After his breeding experiences, Master Millman entirely agrees with the views expressed by Mr. M. J. Anns (August edition), concerning the raising of too many youngsters from a brood of fry. Master Millman started with one pair of expensive guppies and allowed their young to "over breed." He now has a tank full of undersized guppies, some with poor colours and some with split tails. Only a few good specimens developed. Having just bred goldfish, he does not intend making the same mistake again, and is watching the fry day by day. Master Millman is going on holiday shortly, and he intends switching off all his tanks' lights, and dropping a "vacation block" into each tank. He asks if I would agree with his doing this. (I would probably leave lights off—if I did not have an automatic time switch—and leave filters running; I would probably omit the vacation blocks unless I was unable to get someone suitable to feed the fish and was going away for longer than two weeks—but it's purely a matter of opinion. When I went to feed my school fishes last week—in the middle of the school holidays—I found that the school secretary had kindly fed them for me. Unfortunately, her hand had slipped as she shook in "a little" food from a half full drum of Tetramin, and the dozen or so fishes in the tank had "showers of blessings" in the form of a whole half drum of food. The fishes appeared to be in the midst of a snow storm, and several other people were about to take drastic measures to clear out the tank or move the fishes into another tank. Taking the easy way out—or the lazy way?—I simply switched on the outside filter and made sure that no more food was available for adding to the tank for a number of days. Five days later I again called at school and found that, as I expected, the tank was perfectly clean and the fishes quite happy.) Master Millman's choice of air pump is the Pet Craft model which, he says, needs little attention and makes very little noise. He lives at 101 Loushers Lane, Warrington, Lancashire, WA4 2RF.

Mr. J. Roach, of Wigan Road, Leigh, Lancs. says: "Please ask Mr. Anns to keep his hands off 'News from Aquarists' Societies'." Mr. Roach states that society members follow friends' progress at shows through this feature, and that show men and women read every

word and every show detail. He has not shown any fishes for four years, but he never misses a word and feels that he keeps up with the show scene through these columns. Before going on holiday, Mr. Roach feeds his fishes up on live foods for a week, and then he switches off lights and pumps and forgets about the lot. His fishes are in perfect health even after two weeks.



In complete contrast are the views of Mr. J. Miles, whose address is 3 Hobbshill Road, Great Missenden, Bucks. He says: "In my opinion, 'News from Aquarists' Societies' is a waste of paper which could be used for more of W.I.Y.O.?" What are other readers' views on this subject? Mr. Miles then goes on to discuss the breeding of angels. He had a magnificent pair of half black *P. scalare* which he raised to maturity in a community tank. They were fed on young livebearers, *Tubifex*, white worms and prawns, and when they paired off they were put into a tank which was 18in. long x 22in. high x 13in. broad, and contained a large Amazon sword plant. The water reaction was pH 6.8, the hardness level 60 p.p.m., and the temperature 82°F. The fish spawned every ten days if the eggs were removed, and even fifteen days if the eggs were left with them—but the fry were eaten in the latter case when they became free swimming. Mr. Miles suspected that the feeding of young livebearers to the angels caused them to eat their own fry. When a leaf with eggs was removed to a five gallon hatching tank, the fry which hatched could never get off the leaf. Several people suggested that the cause could be a high bacteria count in the water, but even a double dose of methylene blue, and 200,000 units of penicillin per gallon, made no difference. Mr. Miles then used a power filter to pass the water through a U.V. lamp, and this did the trick—but only about thirty babies in a batch would be normal; the others would be deformed

in some way. Mrs. Gwen Skipper, of "The House of Fishes," suggested that it could be a genetical problem as these are "man-made" fish, and Mr. Miles gave up in frustration.

Mr. Miles also had a pair of silver *P. scalare* which were never fed on live, baby fish, and these fish spawned every five weeks, raising about two hundred fry every time. The water reaction was pH 7.0, the hardness 150-200 p.p.m. CaCO_3 , and the temperature 82 F. The fry were taken away when the parents began to prepare to spawn again. (Might the fact that this water was neutral, and quite a bit harder than that in the former case, be factors which led to successful spawnings?) Being short of food one day, Mr. Miles fed the adult angels on baby guppies, and from then on they ate their own fry when they began to look like young fish; but hatching the eggs with an air stone and methylene blue added, never presented any problems. Mr. Miles does not think that Mr. Anns has the whole answer with his postulation. He feels that the problem concerns raising too many babies in a given space, together with feeding problems. With angels, he feels that the stronger ones dominate the tank, getting all the food; they grow quickly and then eat the smaller ones. He has found that if the larger ones are removed, the smaller ones always catch up as they do not have to compete for food. He feeds with newly hatched brine shrimp, and then chopped *Tubifex*, and all his fishes—including marines—get this, but it is sterilised with ozone. His favourite air pump is the larger Rena, and he says: "You could pump up your tyres with one of these—although the tiny flap valves, when you can find a shop which keeps these, cost a small fortune." Mr. Miles includes in his letter a diagram of an artificial spawning site, made from glass and perspex, but I do not have space to include it. He ends by suggesting that I include comments on marines, and feels that I would be surprised at the response from readers. (I mentioned this point in last month's feature. Let me have any problems which you would like to have discussed and I'll include them in future editions.)

Mr. P. J. Taylor's home is at 23 Brudenell Road, London, S.W.17, and he says that there is nothing new in Mr. Lester Miller's suggestion (August edition) that home prepared foods should be mixed with manufactured dry foods. (I don't think that Mr. Lester Miller suggested that it was a "new" idea!) Mr. Taylor says that this is, in fact, the method of feeding recommended for commercial growers on the Continent who raise fishes for human consumption. He has raised tropical and coldwater fishes this way for years. Mr. Taylor feels that it is the wide sale of flake foods—and what he calls "their exaggerated claims"—which have prevented younger aquarists from making their own mixes. He says that flake foods are not suitable for mixing, and are too expensive anyway.

"Fortunately, there are still shops which offer non-flake foods like McLynn's and Elite, and these are both very good," he writes. In contrast to Mrs. Hanning, Mr. Miles suggests that instead of considering a fortnightly "Aquarist", a weekly one would be better. He is an angler, and also collects stamps, and he says that these hobbies are catered for by weekly papers. (I must admit that I would prefer one decent magazine to several newspapers.)

6 Oxenham Green, Chelston, Torquay, is the heading on Mr. S. J. Heale's letter, and he agrees entirely with Mr. Anns' views—and goes even further. He feels that after the first brood and selection, no further broods from the same mating should be saved if good, healthy young are required. He says that no doubt many people will disagree with him—especially commercial breeders to the trade, but he says that, in the latter instance, this is understandable up to a point. In his first attempt at breeding, he placed a gravid female platy in a breeding trap which he housed in his community tank. The fish was very distressed and he felt that this would mean that the babies born would be "under par." Also, although the fish was only fed lightly in the trap, the small amount of uneaten food on the trap's floor would not have been good for any babies subsequently born. He thus decided to invest in a 12in. x 10in. tank, and this was set up with everything except plants. Thirty-three active babies were born, and they were fed on Liquifry for the first five days, and then on Biol for three weeks, augmented with Tetramin First Food. The result: fine healthy babies which never looked back—and no losses! Mr. Heale states that his original heater and thermostat were separate units, and he found that he could not get a temperature fluctuation of anything less than 4.5°F between high and low settings. He therefore got his first combined heater/stat—a Springfield model. This adjusted to 76-78°F, a difference of only 2°, and it always remains constant. He noted that the Springfield advertisement offered a replacement heater element, should it ever be necessary, and Mr. Heale asked his regular dealer to get him one. Over a period of several months he got the same reply: not available from his wholesaler. Two other dealers produced the same result, so Mr. Heale wrote to Springfield direct on a Friday, enclosing a S.A.E. for a reply. On the Monday morning he received a most kind and courteous reply stating that as there was so little demand for them, few dealers stocked them, but that Springfield had arranged for one to be sent to him under separate cover. It arrived by the next post! He says a big "Thank you!" to Springfield, apart from his letter to them, and says that this was an example of service which is sadly lacking today. Mr. Heale ends his letter by wishing "our mag." every success.

Finally, we come to a letter from Mr. M. Copland,
(continued on page 273)

THE FRESHWATER FISHES OF THE SOLOMON ISLANDS (Part 2)

by W. Noel Grey

6. *Kuhlia marginata* (Cuvier), the Spotted Flag-tail. D. X, 10-11. A. III, 11. V. I, 5. P. ii, 11-12.

The Flagtails are somewhat similar in appearance to the North American Sunfishes although they are slightly more streamlined. The Spotted Flagtail is silvery with a darker bluish or brownish back. The upper sides have blackish spots which sometimes extend on to the fins. The soft dorsal and caudal fin are edged with black.

These fish are common in all the larger rivers and estuaries and are quite easy to catch if the conditions are favourable, i.e., shallow water, using the throw net. Although they certainly do occur in brackish water, they extend far upstream into the cooler fast flowing fresh water. They are therefore obviously adaptable to freshwater conditions and most of the specimens taken have been from the higher reaches and put straight into freshwater. The specimens taken from the brackish waters are noticeably paler than the others which are quite brilliant.

The largest specimen caught measured 18 cms. and few, if any, have been seen any longer.

A good community fish. Always active but in no way troublesome. Needs a lot of space to be happy and water must be aerated or circulated otherwise they get sluggish and pale.

Caught with Crescent Perch, Silver Grunter and Snake-Head Gudgeon.

Indigenous name: Modoc.

7. *Chelonodon patoca* (Hamilton-Buchanan), the Milk-Spotted Toadfish or Puffer. D. 9-11. A. 8-10. P. 16-18. No ventral fin.

Brownish or blackish on back with small pale spots. Lower sides and belly white or yellow. Caudal fin with dark edges in juveniles. Also in juveniles the back has three dark saddle-like bars which may be more or less distinct according to the mood of the fish. The pupil of the eye is blue, with a reddish iris.

This is one of the Tetrodon family which are poor swimmers and are capable of inflating their bellies when annoyed or frightened. All are to be found in moderately shallow coastal waters and estuaries, some entering or even living permanently in fresh water. They are poisonous, or at least some of their organs are toxic, the poisons not being destroyed by cooking, and therefore should never be eaten. Some people claim that there are seasons when the flesh is safe to eat, but even at these times fatalities still occur.

Only small specimens of this fish have been caught, up to 4 cms., but larger ones have been seen and one which measured 22 cms. was found dead after a flood had overflowed the banks of a river. It has been fairly easy to catch once found although its colouring blends in extremely well the bed of the river when seen from above. Normally found in plant free flowing rivers and has been found to eat plants when kept in aquaria. Not a good community fish as it can be a persistent fin nipper.

Prefers fresh fish or meat but will accept dried foods.

Found with Scats, *Monodactylus*, Spinefeet, Pipefish and other Toadfish.

Indigenous names: Boe and Tetautu.

8. *Arothron immaculatus* (Bloch and Schneider), the Narrow-Lined Toadfish or Puffer. D. 9-10. A. 9-10. P. 16-18. No ventral fin.

Olive-green to grey on back lightening to yellow-olive on belly. Thin brown lines, roughly horizontal and parallel, on body but curving on head. The central ones curve round in front of the pectoral fins and then double back. The fins are yellowish but the caudal is edged with black. The caudal is usually contracted but when the fish changes direction quickly it is opened out and it is seen to be convex in shape.

The largest specimen so far caught has been 8 cm.

and it has not been difficult to acclimatise to fresh water. A good community fish if kept with fish of equal size as this specimen would eat any other fish up to 2 cm. long, even other toadfish. Causes no trouble with the larger fish and is not a fin nipper. Apparently has no preference as regards water conditions, living quite happily in either stagnant or aerated, clear or green water. It does, however, prefer to have the temperature a little higher than some other fish, 28°-30°C. Very difficult to find and has only been caught when fishing under the overhanging vegetation along the banks.

The 8 cm. specimen mentioned above has proved most interesting in that it will knock down food from above in much the same way as the Archer fish, although not with the same accuracy or range. Not having any experience of keeping this fish before, the author cannot say from first hand knowledge if this is a normal habit, but none of the other aquarium specimens show similar activities at the moment, and there is no mention of it in the literature to hand. The fish swims to the surface and pushes its head clear of the water and ejects quite a large drop of water. The size of the drop seems to have a deterrent effect on the accuracy and range and by the time the drop hits the glass covering the aquarium it has broken up into smaller droplets. The maximum effective range appears to be about 10 cms., but whether this range increases with the size of the fish has not been determined. The smaller specimens of the same fish have shown no sign of similar activities.

Accepts dried and fresh foods equally well but shows no interest in brine shrimp. Prefers the larger foods rather than fine.

Caught with Scats, *Monodactylus*, Pipefish and Spinefeet.

Indigenous names: Boe and Teetee.

9. *Arothron reticularis* (Bloch and Schneider), the Reticulated Toadfish or Puffer. D. 10-11. A. 10-11. P. 19. No ventral fin.

Dark chocolate-brown with white elongated spots on back. Belly white with dark brown longitudinal lines, the upper ones curving round the base of the pectoral fins. (The colours as described could be reversed as the percentage is about 50-50.) The caudal fin is spotted but the remaining fins are clear.

Only two specimens have so far been caught, both being found in a stagnant pool which is an ox-bow of the main river. The pool is shallow, up to 1 metre, and obviously subject to a wide temperature range. When the fish were caught it was nearly midday and the temperature was 30°C. Takes to fresh water with no trouble and makes a very handsome addition to an aquarium. Causes no trouble to other fish, even small ones, and yet is quite active.

Accepts fresh and dried foods equally well but not brine shrimp.

Caught with Scats, *Monodactylus*, Spinefeet, Pipefish and other Toadfish.

Indigenous name: Boe.

10. *Siganus vermiculatus* (Valenciennes), the Vermiculated Spinefoot or Rabbitfish. D. XIII, 10. A. VII, 9. P. ii, 14-15. V. I, 3, I.

Pale brown body and head with pale blue vermiculate lines which are very numerous and almost as wide as the interspaces. The spiny dorsal and caudal fin are spotted brown, with the soft dorsal paler. The anal fin is yellowish edged with deep brown. The eyes are blue.

At first glance when caught this was thought to be a *Nandus* (Leafish) but on closer inspection it could be seen that the head was more blunt and the mouth thicker. As can be seen from the ray counts the dorsal and anal fins are very long, the dorsal beginning above the operculum and the anal from halfway along the underside, both extending to the base of the caudal. The fin spines are extremely sharp and care should be exercised when handling as the sting can be very painful. A notable feature is the ventral fin which has a spine at the end as well as the beginning.

Only small specimens have been caught, 4-5 cms., but much larger ones have been seen, in the sea. Only caught in one spot which was the same ox-bow as where the Reticulated Toadfish was taken. They are naturally herbivorous, finding the tips and young shoots of *Vallisneria* particularly to their liking, and should therefore be given plenty of vegetable food. They will eat flake food if necessary but not brine shrimp.

Caught with Scats, *Monodactylus*, Pipefish and Toadfish.

Indigenous name: Teapi.

11. *Mesopristes argenteus* (Cuvier), the Silver Grunter. D. XII, 10. A. III, 8-9. P. 12-14. V. I, 6.

As the name suggests, this is a fish which is mainly silver in colour, with attractive dark brown or black stripes. The stripes are four in number, horizontal along the base changing to convex along the back, and all converging at the upper snout. With age and size however, these stripes disappear, leaving a uniform silver-grey body. The body shape is almost a straight line from the lower jaw to the tail with the upper part almost semi-circular except for the snout which is sharply pointed. An attractive fish with clean lines and markings. The spiny dorsal, ventral and anal fins have blackish membranes between the rays. The soft dorsal has a convex line running through it which could be regarded as an extra body line as it conforms to the pattern of the others. The pectorals and caudal fin are clear.

All specimens of this fish have been caught in clear running streams and the largest one measured 8 cms. This belongs to the same family as the Crescent Perch, Theraponidae, but shows none of the aggressiveness of the latter. A good community fish, certainly at the size stated.

Caught with Crescent Perch, Spotted Flagtail and Humped-Back Cardinal fish.

Indigenous names: Leto and Kaba.

12. *Amphitherapon caudavittatus* (Richardson), the Flag-Tailed Grunter. D. XIII, 8-9. A. III, 8. P. 14-15. V. I, 6.

Another member of the family Theraponidae but apparently does not grow to such a large size as the others. In colour it is not so distinctive, being dark green to grey above and white below. The upper sides have numerous dark round spots as does the dorsal fin. The caudal fin has two oblique black bars converging backwards similar to those of the Crescent Perch. The fins are yellowish in colour and the dorsal fin has a blackish edge.

This fish, together with others which will be described later, were caught during a trip to Lauvi Lagoon. It may be appropriate at this time to give a little background information about this lagoon as it has proved extremely interesting both from the flora aspect as well as the fauna.

Caught with Milkfish, Tarpon, Horse Mackerel, Mangrove Jack and Giant Long-Finned Eel.

Indigenous name: Walu.

Lauvi Lagoon is situated on the south coast of Guadalcanal, the 'Weather Coast,' and is roughly triangular in shape. It is contained by two bush covered spits which are joined together by a high storm beach which forms the apex of the triangle, pointing south. The lake covers approximately one square mile in area and is up to 4 metres deep. It is fed by small streams and springs from the mountains to the north. Every year, during the peak of the rainy season (July-August), the level of the lake rises until the pressure of water forces a break in the storm beach thereby creating an outfall. Many fish congregate at this point at this time and an interchange of species occur. Many of the larger fish escape to the ocean while the fry of others enter the lagoon where they adapt to freshwater conditions. These young fishes survive and grow quickly in the lake which has large concentrations of freshwater plants, including *Vallisneria*, *Nitella*, *Fontinalis*, *Ceratopteris* and *Ceratophyllum*. It seems unlikely that this type of fish would breed in the lake, but it proves that the juveniles are readily adaptable to freshwater conditions. There was not much time available to do a proper test of the conditions but the following results were obtained.

Air temperature, day	..	33°C.—37°C.
Water temperature	..	20°C.—32°C.
Water pH	..	5.6—6.9
Salinity	..	Nil

13. *Toxotes jaculator* (Pallas), the Archer Fish. D. IV, 12. A. III, 15-16. P. 12-13. V. I, 5.

Brown to live green on back changing to silvery yellow below. The upper part of the body has five saddle-like black bars, the first and smallest passing through the eye, and the fourth being the largest. The soft dorsal, the caudal peduncle and the anal fin are black, the rest of the caudal being yellowish. The juveniles have yellow and red-brown highlights on the back but these disappear with age and when kept at lower temperatures. The spiny dorsal has only four spines which distinguish it from the other Archers which have five.

A great deal has been written about the ability of these fish to catch insects by shooting at them with drops of water so this aspect will not be dealt with. It is, however, obvious that the above-water vision of these fish must be extremely good and they have in fact proved very hard to catch. Only one specimen has been caught during daylight, all others being taken at night with a torch and hand net. They are easy to acclimatise to aquarium conditions and are good community fish, although care should be taken to keep the aquarium covered as they are good jumpers. The reason for the scarcity of these fish in home aquaria must be due partly to the difficulty in catching them and also to the fact they have not been bred in captivity.

They are a common fish to be found in the larger sluggish moving rivers and the coastal mangrove swamps where they can attain a length of 22-23 cms. The largest specimen caught so far has been 10 cms.

Caught with Scats, *Monodactylus*, Toadfish and Glassfish.

Indigenous names: Daku, Serckona and Ngisu-fingore.

14. *Apogon hyalosoma* (Bleeker), the Hump-backed Cardinal fish. D. VI; I, 8-9. A. II, 8. P. ii, 12. V. I, 6.

Pinkish-brown above changing to pale below with pearly sheen. Fairly translucent. The first dorsal has a blackish tip and the second dorsal has a black spot at the posterior base. There is a large diffused black spot, larger than the eye, on the caudal peduncle. The fins are yellowish-pink.

Due to the pearly sheen and translucent body this appears somewhat similar to the glassfish but its humped back and large black spot make it recognisable as a cardinal fish. Difficult to acclimatise to freshwater conditions and is certainly more happy with a little salt in the water. This is, however, one of those

fish which have been taken from Lauvi Lagoon as well as from the estuaries along the north coast, so it is possible if the fish are taken at the juvenile stage.

Caught in sluggish estuaries and coastal swamps together with Scats, *Monodactylus*, Archers and Glassfish.

Indigenous name: Tataingga.

The pipefishes, together with the Seahorses, belong to the family Syngnathidae. They are small, degenerate and highly specialised fishes which are sluggish and poor swimmers. Such protection as they have is provided by jointed bony armour and their shape and colour provide camouflage amongst vegetation. The fins have degenerated and are of little use and in some cases the caudal fin has completely disappeared, the tail becoming prehensile.

They have no lateral line, no ventral fins and no spiny rays in the remaining fins. There is only one dorsal fin and this is short based. The snout is normally short and tube-like with a small terminal mouth and feeding is accomplished by sucking in small particles passing close by. When breeding, the eggs are deposited on the undersurface of the trunk of the male, and depending on the species, are either unprotected or enclosed in a pouch composed of skin fold or bony plates.

Identification of the various species of Pipefishes is time consuming due to their size and shape and to the measurements which need to be taken other than ray counts. Some are recognisable by their colour, but most of the freshwater varieties are very similar, especially at sizes up to about 7 cms.

Of the five species of freshwater pipefishes so far caught two are fairly easy to distinguish from the others due to their large size and their relatively long snouts. The first of these is:

15. *Oostethus brachyurus* (Bleeker), the Short-

tailed Pipefish. D. 36-48. A. 3-4. P. 18-23. Ventrals absent.

This fish has the longest snout of all, compared to the length of fish, the snout being that part of the head from the eye forwards. The snout measures two-thirds of the complete head, and is almost straight except for the mouth which is slightly up-turned. The length of the tail is only one-third of the complete fish. The central rays of the caudal fin project past the connecting membrane. The brood pouch consists of bony plates with no skin fold. The colour is brownish, lighter below than above, with dark brown marks on the operculum.

These fish have always been caught from the overhanging vegetation along the banks of rivers and normally by trial and error once the area where they are known to be has been discovered. Only in two cases have they been seen before being caught and these were when they were disturbed by catching glassfish.

This is the largest of the pipefishes so far found, the longest specimen measuring 19 cms.

Difficulty was encountered when trying to keep these fish alive earlier on due to not having any brine shrimp available, but by accident it was found that they would eat the eggs of live freshwater crayfish. These are now caught specifically for this purpose and the pipefish are living happily on this diet. It is most interesting to watch them feeding as they will swim up to the crayfish from below and behind and suck the eggs from in between the tail fins. It has also been noted that after the crayfish has shed its skin, within 48 hours the eggs are produced and whether fertilised or not, the pipefish will eat them.

Caught with Scats, *Monodactylus*, Crescent Perch, Hump-Backed Cardinal fish and Spotted Flagtail.

Indigenous names: Ise-Ise, Mila-Mila Tabua.

A Simple Cyclic Timer

by P. G. Boud

AS THE size of aquariums increase, so does the desirability for a greater degree of control and management become apparent. What would be an unnecessary refinement on a 24 in. x 12 in. x 12 in. tank becomes a worthwhile feature on an aquarium double this size. This consideration applies particularly to the use of pumps, filtration systems and control panels.

Whereas a simple and relatively cheap vibrator pump may suffice, an improvement on this usually involves the purchase of a considerably more expensive rotary-driven pump, often of German manufacture. These German pumps now cost in the region of £16-£20 and can hardly be regarded as disposable items.

It is clearly unnecessary to expatiate upon the fact



that the working life of any electro-mechanical item of equipment is largely a function of its operating time. Therefore, it follows that it is worthwhile considering means of extending this time.

The writer has found over the years that it is not essential to run filtration units for medium to large size aquariums continuously or for long periods controlled by a time switch.

For some years an industrial cyclic process timer, giving an adjustable on/off period hourly has been in use, set to give a twenty-minute "on" period in every hour. But these timers are not readily available to the amateur, and tend to be expensive.

Initially the writer designed an electronic timer, using field-effect transistors and Tanatalum low-leakage capacitors triggering a thyristor. But, owing to the cost and complexity of this electronic timing and switching device, it was abandoned in favour of a much simpler method to be described below.

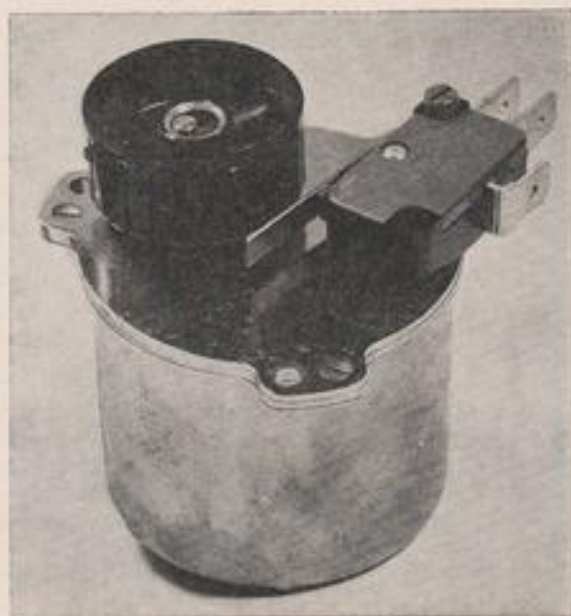
This timing device comprises three items only: a small synchronous motor, a micro-switch and a radio knob. This arrangement has the advantage of being small, simple, effective and cheap, the cost being only £1-£1.25 at the most. The device needs no turning, fitting or cutting work; only a six B.A. screw and nut is needed for the assembly of the items, which are illustrated in the photograph. Synchronous geared motors having one, two, three or six revolutions, per hour made by such manufacturers as Sangamo, Haydon or Smiths, are obtainable from electronic component dealers, costing 50p-75p. The micro-switch is supplied by Radio Spares and is obtainable from the same source.

The principle of operation is simple indeed. It is merely the eccentric motion of the radio type knob when mounted on the motor shaft having a smaller diameter to that of the knob bore. A knob having a diameter of $1\frac{1}{4}$ in. with a standard $\frac{1}{4}$ in. bore is suitable when mounted on the $\frac{1}{4}$ in. diameter motor shaft. The difference between the bore and the shaft will

result in sufficient eccentricity to operate the cam of the micro-switch and provide varying cyclic switching times depending on the motor period. Adjustment within the period is easily effected by merely swinging the micro-switch slightly on its single hole fixing pivot.

The size of the motor is quite small, being a circular body of 2 in. \times 2 in. This timer can simply be tucked away adjacent to the object it is controlling or, for a more elaborate arrangement, it can be mounted on a small panel, with perhaps two small panel-mounted neon indicators showing the switching state of the timer.

The above arrangement will be found to provide a simple and effective control of aquarium pumps and aerators, easily within the means and capabilities of most aquarists.



From a Naturalist's Notebook

by Eric Hardy

"DO YOU KNOW any modern records of the floating water-plantain in Cheshire?" writes a veteran pre-war botanist. *Luronium (Alisma) natans*, with its shiny, elliptical floating leaves and wiry anchored stems which root along their nodes, used to be scarce in much of Britain, but it is steadily increasing either spread along canals around Manchester and North Staffordshire, by barges from its abundant haunts around Ellesmere in North Shropshire, or mostly introduced by aquarists with surplus stock. In Cheshire, it has been in the Macclesfield and Peak Canal for over 50 years. It is also in the canals at Gorton, Openshaw, Middleston Junction, Droylsden and Littleborough around Manchester and Rochdale, and was introduced to Horseman's Pond near Northwich and a sandpit at Mereside, Delamere. It used to be in the Mollington Canal but was collected out in the 1940's. It has a white summer flower. It grows in Langollen Canal, right of the boathouse, and Llyn Elldw Bach, Cwm Bwchan, Merioneth.

It is often confused with the common leathery leaved floating pondweed, *Potamogeton natans*, but I noticed in Hillier's catalogue of water-plants that *Sagittaria natans* is confusingly given as a synonym for it. But it isn't a sag. The latter's floating arrow-leaves of spring are replaced in autumn by long strap-shaped basal leaves, like *Vallisneria*, and it is often used as an oxygenator. Some references (Sanders) give *Sag. natans* as an American (syn. *pusilla*), but it isn't in Hotchkiss's 34-page 1950 Check List of Aquatic Plants of the U.S. (U.S. Dept. of Interior, Wildlife Leaflet 210). There is a European *Sag. natans*, named by Pallas in 1776, with synonyms *S. alpina*, *S. septentrionalis* and *S. sagittifolia tenuirostris*, a cold water perennial. On the other hand, an old name for this plant *natans* appears to have been *Sag. subulata forma natans*. It is also in the Droylsden Canal.

Despite the lemming-like hordes of trippers in Dovedale in July, I noticed that the brook down Inn Dale, from Thorpe to the tea-kiosk by the Izaak Walton stepping stones across the River Dove, is still packed with flowers of blood-drop emlets, *Mimulus luteus*, the most abundant northern haunt of this Chilean semi-aquatic, just as I knew it years ago. It grows by the River Alwen at Llanfihangel Pennant in North Wales. Unlike the common yellow North American monkey musk *M. guttatus* of many stony hill streams in Britain, this yellow-throated flower is marked by very much larger blotches of red. A vigorous hybrid exists

between these, and between *guttatus* and copper-coloured *cupreus*.

Staying in successive years at Monk Coniston Hall, whose long lawn looks down the 5½ miles length of Coniston Water, highest and coldest of the great lakes, I found this is a haunt of trout, perch and pike, of char but not, curiously, of the Coregonid whitefish. This, most interesting of Lakeland's arctic fish, landlocked since glacial times, is also absent from Lake Windermere, probably because its migratory pre-glacial ancestors reached the other lakes from the Solway Firth via the Eden, whereas these two lakes received their fish from Morecambe Bay. While migratory pre-glacial char used both approaches, the whitefish came only from the north.

This whitefish is *Coregonus lavaretus*, which has the adipose or fatty rear fin of Salmonids, but the deeply forked tail, large, nocturnal eyes, larger, silvery scales gill-rakers, and the planktonic diet of the herrings. 87 roundish scales mark the lateral line, with 8 above and 9 below the adipose fin. Variations arose among different breeding stocks whose exit from the lakes was barred by moraines blocking most of the outlets; but these are not separate species, as many have claimed. They are less numerous than char. In Derwentwater and Bassenthwaite where, on exceptions, they take an angler's crust, they are called vendace, *C.J. gracilior*, being more slender, shorter-finned and shorter-headed than Scottish Coregonids, and attain a length of 9 ins. In Hawes Water, Ullswater (Gale Bay) and Red Tarn, an abundant, larger variety is called schelly, skelly, or sheely (*veendesius*) and sometimes grows to over 16 ins. and 1½ lb. weight. On rare occasions some of these have entered the River Eden and its tributaries; but "schelly" is also a Lakeland vernacular name for roach, dace and chub. A female ripe with eggs was caught in the Eden in October, 1969, measuring 13½ in. It also has a relatively small mouth, and 8 rays in its anal and dorsal fins.

Called whitefish from its whitish scales, whose rings can be read like herrings' to age the fish, its sexes separate in winter, to join and spawn in the new year in gravelly inshore water where they scatter eggs and milt at dusk, like herrings, then return to deeper water before summer. Otherwise they shoal by age-groups, feeding, as their subterminal mouth indicates, in the bottom weed, upon copepods, small shellfish, insect-larvae, bloodworms, lobworms and small insects.

Lakeland char, *Salvelinus alpinus* were likewise

isolated to inbreed and produce local varieties or subspecies, not separate species. The Windermere char or belbing, *S.a. willoughbyi*, the largest grows to 9 or 10 ins. and 3 lb and also inhabits Coniston Water, Crummock, Ennerdale, Buttermere (with pike and perch), Wastwater, Goatswater and Seathwaite Tarn. It is the natural food of eels, goldeneye and other diving duck. Introductions to Loweswater, Bassenthwaite and Derwentwater failed, because these lakes are too shallow and warm. These fish cannot survive in water over 59°F., so they are also absent from Grasmere, Rydal and Esthwaite. Ullswater has lost its char (which used to spawn in Glenridding) apparently to lead-poisoning from mine-washings, though it was restocked in 1895. About 1870, Windermere was re-stocked with 180,000 reared in a hatchery on Wansfell; but efforts to introduce them to Hawes Water to increase the size of its small Lonsdale char, *lonsdali*, failed.

The Hawes Water race may be smaller because the lake's hard rocks yield less mineral food. They grow to 7 in. and average 3 oz., having a longer and more pointed snout, narrower operculum, smaller eyes and larger fins.

Beautifully scarlet-bellied or orange-finned according to season, their size varies according to food as well as age, and in Coniston Water, Willoughby's char, is smaller and darker, and about half a pound. Char. have blue-green backs rather like mackerel, and silvery, white-spotted sides, suffused with pink and orange. Spawning males have the reddest bellies and females the reddest flesh. Their few teeth in front of the vomer lack the trout's double row down the middle. Shoals feed near the bottom on aquatic insects, molluscs and crustaceans, tiny fish fry and worm. They spawn from November to February, small fish returning annually to the River Brathay (which, from Elter Water, is slightly colder than the Rothay from

Rydal) and to shallows near the banks, and larger fish prefer slightly deeper water. Some spring spawners lay in February and March in 6-60 ft., where their eggs lie unprotected in the stones, unlike the salmon's redd, and hatch in 10 weeks. Early in April, the young char move into deeper, cooler water. Char. have interbred with trout.

Ullswater's 7½ miles are pikeless as well as charless. Ennerdale is pikeless. Thirlmere has 5½ miles of trout, perch and pike. Pike hunt Esthwaite and Rydal and the legendary 14th century "vast fysshe of Morderyne Meere" (Morden Mere, a dark Cumbrian tarn) was obviously a large pike, with nothing of the Loch Ness rubbish. Windermere has salmon, trout, char., pike, perch, eel, roach, stone-loach, bullhead, minnow, tench and three-spined stickleback. Big bull trout, once acclaimed as separate species, *Salmo ferox*, with a rounder tail, are merely local varieties growing large, up to 12 lb. in Windermere, on abundant food, like the once claimed "Ullswater trout" which has reached 14 lb. in Crummock and 16½ lb. in Ullswater, and occurs also in Wastwater and up to 8 lb. in Ennerdale.

Derwentwater and Bassenthwaite have perch, pike and salmon as well as char. So-called rainbow trout, which are really American steelheads, have been introduced to waters like Lupton Reservoir near Kendal, the River Kent and the Eden; but they seldom spawn.

Lakeland rivers lack barbel, bleak and bream. Grayling are confined to the River Eden, ranging up to Appleby. Chub, dace, roach, and a few perch are in the Eden, where flounders ascend to Rickerby rocks. Bullheads share the fast upper becks with small brown trout, mayflies, stoneflies, caddis and freshwater shrimps, while the still waters of Ulverston Canal Foot augment Lakeland's fish list with introductions of common carp, gudgeon, and other coarse fish.



THE BRITISH AQUARISTS' FESTIVAL,
REPORT ON SHOW AND RESULTS
WILL APPEAR IN
OUR DECEMBER ISSUE

REVIEW OF NEW JOURNAL

AQUARIUM DIGEST INTERNATIONAL, published four times per year by Tetra Werke, Dr. rer. nat. Baensch, 452 Melle, Herrenteich 70, Postfach 1580, West Germany, in co-operation with Tetra Representatives, available in Britain from TetraMin Sales (U.K.) Ltd., Bridgwater, Somerset, England, on annual subscription, four issues per year, for 50p (two years £1; three years £1.50). A vinyl binder to hold copies is available, price 50p.

I was interested to receive Vol. 1, No. 1, dated Spring 1972, of this new publication, which apparently grew from the little Tetra Information pamphlet which the firm began to produce five years ago. The publishers describe it as "a fascinating potpourri from the world of tropical fishes," and I think that this is as good a description as could be given. This small journal contains 24 pages, and is illustrated with a wide variety of coloured and black and white photographs and drawings of a high quality in the main. Naturally, as the journal is produced by the manufacturers of TetraMin, it contains a couple of pages of advertise-

ments for these products and references to the feeding of specific fishes often include recommendations for TetraMin foods as appropriate.

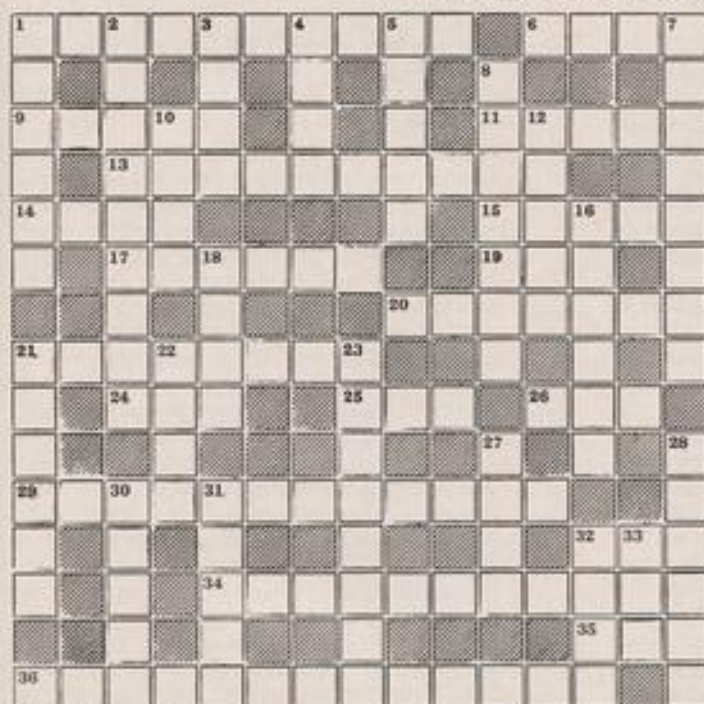
Issue No. 1 contains a wide variety of short items from many parts of the world, many of them being translations from foreign language aquarium magazines as well as articles from aquarium magazines in other English speaking countries, including one from an English publication. Holland, Australia, France, Germany, Switzerland, England and Czechoslovakia are some of the countries concerned. Some of the headings used include: News and Comment, Fish Fantasia, Care and Breeding, Water Plants, Beginner's Topics, Aquarium Chemistry, etc.

Although tropical freshwater fishes and marines are discussed, as well as items on marine algae and freshwater plants, some of the fishes discussed were ones which I have not yet come across—but I suppose that many thousands of fishes come into this category.

All in all, I found this to be an informative and entertaining little magazine, presenting news and views from many parts of the world. It would certainly be of interest to the majority of aquarists—and 50p per year is not very much these days! B.W.

The AQUARIST Crossword

Compiled by M. W. CLARKE



Solution on page 279

CLUES ACROSS

1. Famous for many exotic cichlids (4, 6).
6. *Cyprinus carpio* (4).
9. Large flatfish (5).
11. Has a white spider on its north side (5).
13. *Rhodospiza sericea* (10).
14. Poetic songs (4).
15. They're ready for that outside edge (5).
17. *Nagritaria* ——— (6).
19. Electrically charged atom, etc. (3).
20. You may be going to if you walk to the wicket (2, 2, 3).
21. Ate caused by a chill (8).
24. Prosecute (3).
25. Is it thrown by *Pteropichthys chrysoptila*? (3).
26. It holds the ashes (3).
29. Some fish show this for their offspring (8, 4).
32. Marshy land (3).
34. Does it keep the pond warm in summer? (11).
35. Muhammed ——— is the greatest (3).
36. He's in charge on the coral reef (8, 5).

CLUES DOWN

1. They have lips (6).
2. Also known as the Dwarf Rainbow Cichlid (9).
3. Soft roe (4).
4. Beautify the angel by covering her in this? (4).
5. Cry from a Dogfish (5).
7. Most diseases are caused by one (8).
8. It's measured by a hydrometer (7).
10. Miss Doolittle from "Pygmalion" (4).
12. Home of ice (5).
16. Inheritance is always so (6).
18. This and tide waits for no man (4).
21. Similar in appearance to the Minor Tetra (6).
22. Obstinate animal often tempted by a carrot (4).
23. Dangerous receptacle to catch a large fish with (5, 3).
27. Beginnings of a pearl (4).
29. Is *Corydoras aeneus* the villain of the tank (6).
30. Connects catchment areas to the sea (5).
31. Gold and platinum are such metals (5).
32. A reaction natural when threatened with a piranha pool (4).
33. *Anguilla anguilla* is the common one (3).

MARINE QUERIES

by Graham F. Cox

I would like to know if it is possible to mix "Synthetica" and "Natura" sea salts with foreign brands of salt?

Yes. It is perfectly acceptable to mix all types of artificial sea-waters on the market in Britain today.

All synthetic salts have as their basis a blend of sodium chloride, magnesium sulphate, magnesium chloride, calcium chloride, sodium bicarbonate and potassium chloride. However, the individual differences and degrees of quality in sea salts is caused by the number and quantity of the vital trace elements which are added to the basic mix. In addition, owing to the minute traces of elements such as indium, gold, silver, uranium and lead, etc., which are added to the better salts, it is frequently impossible to obtain a homogeneous blend unless the trace elements are made up in liquid form.

Notwithstanding these differences, any sea-water with good life support properties will mix with any other water, provided that all the instructions on the packaging are fully complied with.

I am thinking of starting a marine aquarium. What kind of filter should I use?

The question of filtration in a marine aquarium is an important and involved subject to deal with and so this query must be dealt with at some length.

As marine aquarists we must recognise two different types of filtration which, in the absence of more accurate terms I call *Mechanical Filtration* and *Bio-chemical Filtration*.

- (1) *Mechanical Filtration* is the process which most people are referring to when they discuss filtration. It may be defined simply as the removal from the sea-water of gross visible particles of solid substances which give the water a cloudy and unwholesome appearance.

Types of Filter offering good mechanical filtration:

- (a) *Power Filters*.—Undoubtedly the most efficient type of *mechanical* filter. In filters of this type an electrically-powered water pump sucks the aquarium water through a plastic box containing charcoal and/or synthetic fibre "wool," the filtrant media are so arranged that the water passes first through the granular charcoal and then through the minute inter-fibre spaces of the filter "wool." A recent introduction on the marine aquatic scene is an American power filter,

in which the sea-water is sucked through a fabric septum coated with diatomaceous earth. The D.E. "cake" which so results has filter pores so small that not even bacteria can pass through. Prices range from £13 to £70 each.

- (b) *External Box Filters*.—These are usually operated by an air-lift, i.e., a small vibrator operated air pump supplies the motive power, although two external box filters (one American, the other British) are available with electrically operated rotary water pumps.

External box filters are not quite so efficient as the power filters but are much cheaper at £1.50 to £9 each, and are certainly good enough for tanks up to 48in. x 18in. x 18in. = 55 gallons (250 litres) if used in conjunction with the U/G filter (see below).

- (c) *Internal Box Filters*.—These are always air-lift operated, i.e., they require a small aquarium air pump to operate them. They are really only suitable as *de-colorisers* for the marine aquarist, i.e., packed with a highly-activated marine grade charcoal (e.g., "Seacoal")—and for this they are ideal.

(N.B.—If regular 3-6 month partial water changes are not carried out, the marine aquarist should de-colorise his sea water continuously to remove the yellow toxic phenols which slowly build up in old sea-water. Additionally, continuous use of trace element boosters will be necessary to revitalise the "tired" water).

Needless to say, an internal box filter, even if it is packed with filter "wool" as well as marine charcoal is not adequate without U/G filtration for even the smallest marine tank. However, used in conjunction with a powerful U/G filter, it is the ideal device for continuously de-colorising the sea-water in an all invertebrate or invertebrate + fish community collection, since the planktonic food so vital to filter feeding invertebrates like corals, sponges, feather dusters, worms, etc., can pass between the coarse particles of charcoal with ease. Conversely, a power-filter or even an external box filter, with their more powerful suction and filter "wool" would remove large quantities of planktonic food from the water, resulting in the

less nitrates. Consequently, after 20-50 days of high nitrite readings, the aquarist will find that suddenly, within 3-5 days, his nitrite reading plummets down to nothing (0 p.p.m.=zero parts per million) thus showing that his filtrant gravel is now bacteriologically matured. When the zero reading has persisted for 2-3 days, he will now be able to add the more spectacular show fishes, such as Butterflies, Angels and Surgeon fishes, etc., to his matured biosystem.

N.B.—Even the initial, relatively tough damselfishes will not survive the period of high ammonia—high nitrite toxicity unless they are treated every other day with an odinium cure such as Cuprazin, whilst ever the nitrite reading persists.

Once the filter gravel has fully matured bacteriologically, no ammonia or nitrite reading will ever occur again except possibly a slight (0.1 p.p.m. to 1.0 p.p.m.) reading for an hour or so after heavily feeding an over-stocked aquarium. This is because the sequence:—**AMMONIA — NITRITES — NITRATES** proceeds in a dynamically balanced equilibrium state.

Incidentally, it may be worth mentioning here the two alternative methods of achieving bacteriological maturity in a new marine aquarium are as follows:—

- (a) Instead of using Damsel fishes to mature the aquarium, which may be too small for some aquarists' taste, certain of the Wrasses, Batfish, Triggers, Groupers, Squirrel fishes and Big-eyes have equal resistance to ammonia and nitrite toxins *provided always again*, that alternate day Cuprazin medication is maintained during the ammonia and nitrite phases.
- (b) If a small piece of prawn (say garden pea-sized in a 20 gallon tank) is left to rot down in a marine aquarium, first ammonia and later nitrite toxins will appear, until eventually

enough nitrifying bacteria appear to remove all toxicity. The reason why this method is seldom used is because few marine aquarists have spent money on a salt-water set-up, are content to sit watching a chunk of rotting prawn for 4-6 weeks until the nitrites fall to zero.

To condense some of the above, then, it is fair to say that the power filter offers the best mechanical filtration but only fair biochemical filtration, whereas the powerful marine U/G filter offers excellent biochemical filtration and very good mechanical filtration.

In the case of almost everyone starting a marine aquarium I would advise the following as offering the best value for money:—

- (a) *For fishes only:* A high-powered U/G filter plus external box filter with highly-activated marine charcoal and filter "wool".
- (b) *For fishes and invertebrates:* A high-powered U/G filter plus internal box filter *without* filter "wool" but using H/A charcoal.
- (c) *For invertebrates only:* As for (b) above.

The recommended stocking ratio is 1in. of fish to four gallons of water for the first four months, increasing to a maximum of 1in. of fish to two gallons of water thereafter. However, no matter how much well-meaning advice they are offered, many beginners deliberately overstock their aquaria. In these circumstances it may be necessary to purchase a power filter such as a Nuova or Eheim in order to obtain clear water, i.e., in order to obtain an additional degree of mechanical filtration.

Finally then, to crystallise all the above into a few words, one may say of filtration in the marine aquarium: If you can only have *one* filter on your aquaria, it *must be* a high-powered U/G filter; if you can afford two, it should be a high-powered U/G filter and either internal or external box filter; and if money is no object and filter-feeding invertebrates are not to be kept, it should be a U/G filter and a power filter.

CRYPTOCORYNES FOR CONTRAST

by Bill Simms

AS THE TROPICAL aquarist progresses with his hobby he tends to lean more and more on the cryptocorynes for display, using large clumps of the different leaved species to add that professional look to his aquarium. The majority of them are so steady and slow-growing that they can be depended on to remain ornamental

while other plants around them become stringy and need replacing.

But there are so many similar looking Cryptocorynes that it is not always easy to recognise the kind offered for sale. If there is an identifying name on the plant it is not always certain that it is correct—there



Cryptocoryne retrospiralis

has been so much mis-naming in the past. *C. beckettii*, for instance, which has broad tapering leaves, is often offered as *C. cordata*. Nevertheless, this situation has been improving lately, and the better nurseries of tropical water plants always name them correctly.

If you can acquire *C. beckettii* (*cordata*) then do so, for it is a robust plant that reaches a height of about 8 in. or so. It will grow well in a thickly planted aquarium, for it prefers a slightly diffused light and thrives in slightly acid water. It comes from Ceylon, and grows there in water that varies in temperature between 20 and 26°C. (68-80°F.), and so suits our tropical aquarium range of temperatures well. It should never be allowed to become too cold or too hot.

To persuade *Cryptocorynes* to give of their best they

should be rooted in a compost that has some clay or soil in it, and to avoid this soiling the water requires a lot of care. One method is to place a 1 in. layer of soil at the bottom of the tank and cover this with at least an inch of gravel. But if you are in the habit of placing in new plants from time to time, the base of the soil may become stirred up with consequent troubles. When used for a complete initial planting, and not disturbed afterwards, this permanent base method is good.

A good soil compost for the tank bottom could be made from three parts of clay or good rich loam, one part of fine peat, and one part of sand. This is mixed very thoroughly in the dry state, damped down a little (not wetted) and then placed in the tank in an even layer, tamped down gently, and covered with a generous layer of gravel.

When planting the *Cryptocorynes* the theory is that you set the roots in the gravel on top of the soil compost and they send out new roots into the compost. In practice the process is somewhat more messy, for roots are of various sizes, and some of the rhizomes of *Cryptocorynes* are bulky, and so one finds that the soil is disturbed also.

I find that a good method is to have 2-3 in. of water over the gravel, and plant everything at that level. When all the plants are in I syphon off the resulting muddy water, and then put an additional half inch of gravel over everything—having allowed for this in my planting to keep the crowns of the plants at the new higher level. Then I gently syphon in some clean water, and if necessary remove this later,



C. griffithii

and syphon in a new lot of clean water—making sure, of course, that each batch of water is at about 22°C. (72°F.) all the time. Usually this results in clean water above the gravel, but if not I repeat the water changes until it does.

Another method, more useful for the man who wishes to add plants occasionally, is to use an all gravel base in the aquarium, and to set all the special plants that need it in individual pots. These pots should be about 2 in. deep, and fairly wide, and are not easily found. I came across a large stock of rigid thin plastic pots of a suitable size some years ago, but have never seen any since. But there are many plastic containers on the market that can be cut down to size. Try the polythene washing-up liquid containers.

An inch of the same soil compost is placed in the pot, the plant is set in that, and gravel added on top—making sure that the crown is level with the top of the gravel. Lowering this into the water requires a little care to avoid soiling the clean water.



C. willisii



C. beckettii (*C. cordata*)

Do it extremely slowly until the surface is just awash, and then lower the pot into a hole prepared in the gravel base. If you have done it correctly there should be perfectly clean water, and then a banking-up of the gravel at the pot edge should conceal it well.

A *cryptocoryne* that contrasts well with *C. beckettii*, with its broad green-bronze leaves, is *C. willisii*, which has narrow wavy leaves, usually of a lighter green shade—though fully adult leaves are diffused with reddish-purple. This grows to about 8 in., also, and forms fine clumps, though it takes a long time to do so. When fully mature this plant produces stolons, with young plants growing at the nodes. By this means a good supply can be built up over the years for if detached when well rooted the youngsters soon become established as individual plants. Not many plants reproduce as easily as this one does, and so it is a most useful *Cryptocoryne*. To obtain the best display effect a number of young plants should be set in a clump, allowing 1—1½ in. between each plant.

C. retrospiralis is different again, having the narrowest leaves. The mid-green wavy leaves are only about a quarter inch wide at the most, and form most

attractive clumps of thin curving swords, useful as a foil against broad-leaved plants.

A really broad-leaved plant can make a wonderful central feature in any good aquarium lay-out, and there are many to choose from. If restricting the choice to *Cryptocorynes* then the spectacular *C. griffithii* is the obvious plant, for it has large leaves that are almost as broad as they are long, held up on stout stems. The upper surface of the leaf is a darkish emerald green, with the underside lighter, so that the clump gives a variety of shades. It grows to about 12 in. high when fully mature, but younger

plants stay smaller for a long time.

C. griffithii sends out runners to produce young plants when well grown, and requires a fair amount of room for its tangled root system. Usually a space of 4 in. or so is left all around such a fine central plant, and this will suit it.

All these *Cryptocorynes* prefer medium lighting conditions, of not more than about 12 hours each day, and given a suitable root run in good compost will rarely disappoint the aquarist who goes to the trouble of treating the plants as important inmates of his aquarium.

Aquarist and Home

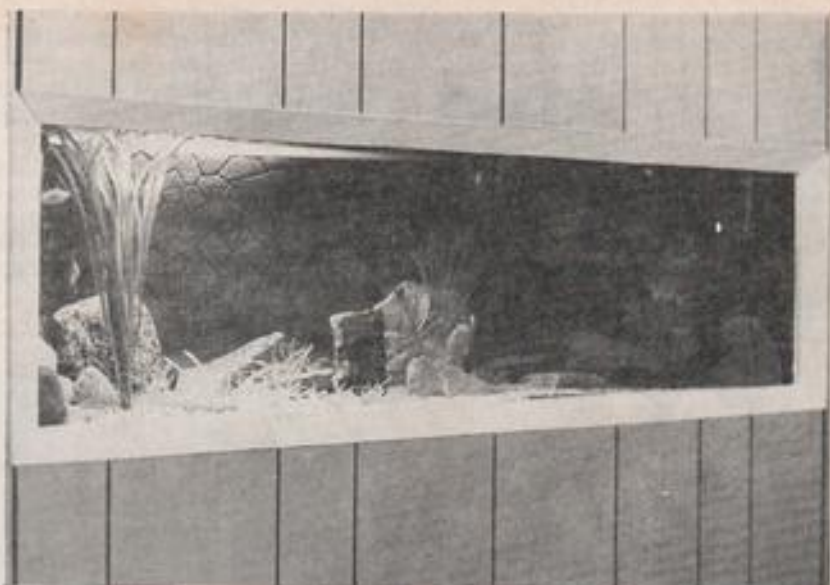
by T. Stevenson

BEING a householder who eats, breathes and dreams fish can be disadvantageous if he has a wife who is understanding, but can take or leave the hobby. I decided a couple of months after starting off with a 2 ft. tank that it was not big enough and a 4 ft. tank was my next aim. This is where the snags started; first, where to put the darn thing and second, an ultimatum from my wife that wherever it was put, it must be part of the decor and not be just a fish tank on a stand. A tall order!

I read up on the subject. I did not fancy sinking it into the brickwork nor did I prefer to have a bowed ceiling (completed tank weighs about a quarter of a ton), so it had to be *against* the wall. The only wall suitable was one on which a radiator was mounted. The wall looked a little empty and only a picture would make it look fuller. A picture on the wall—that was it—create a false wall and the tank would become a living picture. The job had just begun and no kidding!



The radiator was the first thing to be moved. This was to be mounted on the wall on completion, therefore the tank base would not only have to be high enough to lift the tank to eye-level, but be solid enough to hold the radiator. A brick stand would be ideal. So a brick stand it was 4 ft. 2 in. \times 1 ft. 3 in. \times 17 courses high. A layer of polystyrene veneer was then laid on the top of the stand and the tank placed on the veneer; this would help to prevent unnecessary heat loss from the base. Since the sides would also be blocked in, polystyrene



tiles were placed on them for the same reason.

The background of the tank presented a problem. Plastic backings sold in aquatic shops were very expensive and I was reluctant to part with money for this. So it set me thinking. Painting polystyrene tiles in water colours seemed a good answer, but it would still appear a little flat. Then quite by accident, while choosing the panelling in a local store, my wife spotted "crazy paving" polystyrene tiles. Great! The rock effect was there, the thermal insulation was there, and after my wife had painted the tiles, the mood was there. So that was that.

I wanted to create "light moods" in the tank, so I placed an 8 watt, 12 in. fluorescent strip on one side of the tank so that the light intensity would fall off towards the other end. I also fitted four different coloured bulbs with switches along the hood. I chose red to make the tank look fiery; yellow for warmth; blue for coolness and green for depth. Now I had any combination of five lights available.

Incidentally the main wiring had to come from the opposite side of the room and the wire was stapled to the skirting board. This main wiring led to a connector block with the terminals joined in parallel so that "tap-offs" could be easily taken. This was screwed to the wall. Hooks were also screwed to the wall and the pump and other accessories simply hung on.

After setting up the interior of the tank and introducing the fish, it was exit bricklayer, electrician, artist and aquarist and enter joiner and plumber.

I laid the battens to which the panelling would be fixed. The piping to the radiator then had to be extended. So the next thing was to completely drain the central heating system. The radiator valves were

sawn off together with a little piping to overcome the danger of causing a bad compression seal when the valve was refitted. Right-angled Yorkshire fittings were soldered to the stubs remaining and the piping then extended. The panelling was then nailed to the batten with panel pins leaving bare, for the time being, the space above the tank. The other right-angled fittings were then soldered to the pipes, followed by the valves. The radiator was fixed to the brick stand, the valves connected and the system refilled. At this point I nearly went mad, because I encountered a nasty air-lock at the boiler. The radiators heated up nicely at first, but then cooled as the air-lock expanded. The start of the problem to its solution took several hours and numerous muttered words.

Two "cupboard doors" were made to fill the 4 ft. gap left at the top of the tank; this obviously gives good access to the tank. Magnetic door catches were used as they do not stick and the door can be easily opened by using ones fingertips. Thus no handles were necessary on the doors and the illusion of complete panelling was continued.

Below are the costs involved:

Tank and Hood	£15.00
Wood panelling— four sheets 8 ft. × 4 ft.	£7.80
18 battens 8 ft. 0 in. × 2 in. × 1 in.	£3.60
Four right-angled Yorkshire fittings	£0.69
Connector block, switches, bulbs, wire lights, etc.	£4.00
Sweat, hard work and patience	PLENTY!

The finished product can be seen in the photograph. Result . . . a happy wife, a happy aquarist and a much more attractive room.



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

TROPICAL QUERIES

by Jack Hems

Please can you tell me how to tell the sexes apart of the kissing gourami?

Wait until your fish are a fair size, say, about six inches long, and then compare the general shape of one fish against another. The female is more heavily built than the male and when she is in breeding condition (quite a rare event because few aquarists succeed in keeping this fish alive for any great length of time or, put in another way, until it has reached breeding size or condition) the flanks show a distinct bulge.

How can I keep planarian worms in check?

Planarian worms must eat to flourish and they flourish best in a tank with plenty of vegetable and meaty wastes on the bottom. Therefore, a tank with a clean floor means fewer planarian worms. The ordinary paradise fish (*Macropodus opercularis*) makes a good biological control. Provided you do not stuff your paradise fish and so rob them of the inclination to seek food, they will pick off the flat worms they come across and so keep their numbers down.

Please tell me what is best in the way of temperature and food for my sucker loach (*Gyrinocheilus aymonieri*)?

Firstly, a correction. *Gyrinocheilus aymonieri* is not a loach. It is a member of a small family of fishes, with sucker mouths, known to science as the *Gyrinocheilidae*. Apart from the sucker mouth, this family is also characterised by an elongated body and no air bladder. *G. aymonieri* is not fussy about temperature provided it is maintained above 70°F (21°C). As for food, it is chiefly a vegetable eater, and to stay alive needs soft algae to crop. Some specimens appear to ignore even the tastiest live food such as white worms or tubifex.

I have just bought two *Leporinus* that neither I

nor my dealer can identify. The fish are grey, with a black stripe extending from the snout to the tail fin. Can you help?

It is not unlikely that your fish is *L. melanopleura*. This fish from Brazil attains about 7 in. It is peaceful but demands pure water, that is water that is not sullied by too much organic waste. In short, it thrives best in a tank kept clean by constant u.g. filtration.

What can you tell me about the tiger catfish?

Not much apart from the fact that it belongs to the genus *Pseudoplatystoma* and is said to grow large enough to make a hungry South American Indian a dinner. It feeds on small fish and is a glutton for food.

What is the best temperature for keeping and breeding the White Cloud Mountain minnow?

For general care and maintenance a temperature in the upper fifties to middle sixties (°F) is recommended. But for breeding raise to the lower of middle seventies.

I can obtain some finely marked pebbles from a south coast seaside beach. After a good washing, would it do any harm to my fish if I introduced the pebbles into their aquarium?

Steer clear of pebbles from the seaside, particularly from the south coast where a lot of the pebbles are almost pure chalk rounded by the action of the waves. The introduction of any of these into a fish tank would result in very hard and alkaline water. Also, pebbles from a seaside beach are usually impregnated with brine, that is hard to wash out.

I am quite new to tropical fishkeeping and I am having a lot of trouble with my fish. A number of them have lost their balance and are finding it

difficult to reach the bottom. I must say at once that the fish are not overfed and the water is changed every few days.

First of all, in a properly set up and stocked aquarium there is no need to change the water every few days. If fresh water is introduced, however, then every care should be taken to see that it is the same temperature as the water in the tank. If there is a difference of several degrees in the temperature, then some, if not all, of the fish will go down with derangement of the air bladder. Keep the temperature steady for the next week or two and hope for the best. Provided the fish are not too badly affected, a cure will sometimes result if the water level is dropped to about four or five inches and the food given is alive or raw red meat (shredded into fine particles, of course).

I bought some young firemouth cichlids the other day. Have you any idea when they will breed?

I have no idea when your firemouths will breed, if ever. For first of all you will need the two sexes, and the sex of young firemouths is not always apparent. A spacious aquarium and plenty of meaty food will do a lot to encourage rapid growth. Even so, sexual maturity may not arrive until the fish are at least a year old. The "male" characteristics are a long point to the dorsal fin and a bright red lower jaw and chest.

My two scats bully the other fishes in my tank

and drive them away from food, yet all the books on tropical fishes I have read say that *Scatophagus argus* is quite peaceful.

I discovered that scats were bullies more than thirty years ago. Permit me to quote from *Freshwater Tropical Aquarium Fishes*—a book written in collaboration with George F. Hervey, and first published in June, 1952. We wrote, in reference to scats: "They are inclined to bully, but this need not be held against them; for they do little harm and are attractive fish that become very tame in captivity. Their tendency to bully appears to be directed only towards keeping other fish away from food. . . ." All the same, I have kept scats that have killed large guppies.

What is a velvet cichlid?

Velvet cichlid is just another popular name for the oscar alias the ocellatus, alias the marbled cichlid, alias the peacock-eyed cichlid. In short, *Astronotus ocellatus*, the type and its man-made forms.

My *Serrasalmus nattereri* is growing fast in a two-foot tank. What is the maximum length it can attain to in the aquarium?

This is impossible to say because a lot will depend on the swimming space it is given, its general care, and its diet. Yet I would hazard the guess that given a three-foot tank, kept scrupulously clean, and a diet rich in raw fish and red meat, a length of more than 7 in. will be attained in under two years.

COLDWATER QUERIES

I have been keeping fish for about eight years and have come up against a problem. A red fantail in the pond has started to show black marks on the dorsal and caudal fins. There is no sign of disease. What is the trouble?

A red goldfish will sometimes develop a few black patches and it is usually on a spot where there has been some damage. When the new flesh grows it is often black. This may clear up after a time. The fish could have been damaged when spawning especially if there were any rocks in the pond. Normally a fish will not knock against a rock unless chased or is trying to get rid of some form of parasite.

Why is it that a three year old goldfish is still bronze and shows no signs of changing colour?

It is possible that the fish may never turn gold. The reason may be that the fish was from a pond where there were one or two similar fish. If goldfish which fail to change colour are left in a pond to breed it is reasonable to suppose that many of the youngsters will

by Arthur Boarder

not change colour. Sometimes I have found that the warmth of the water when the fry are being reared can make a great deal of difference as to the time of colour change. In water at a temperature of near 70°F, the fry change colour much more quickly than if reared in cold water.

I have four fancy goldfish and some water snails in a 10 gallon carboy. It is three-quarters filled. After a time one of the fish began to lie on the bottom with folded fins. It died after a few days and showed white spots on its fins and body. Now the other fish show the same symptoms. Is this white spot disease?

The symptoms certainly indicate that the fish are being attacked by white spot parasites. I do not like these carboys, as usually there is insufficient surface area to the water. However this would not bring on white spot on its own, but the parasite which is the cause of the trouble could have been on the fish when purchased. However if a fish is in poor condition it is

more liable to attack by parasites than would be a healthy one. To cure fishes of white spot, known as, *Ichthyophthirius*, realise that the parasite is free swimming before it can find a host. It then penetrates the mucus and skin of the fish. The fish reacts by forming a tiny bladder-like formation around the pest in response to the irritation. The parasite feeds on the red blood corpuscles of the fish until it is fully developed. It then leaves the fish and encysts on the bottom of the tank. After a time fresh parasites emerge and the process is repeated. The rate of development depends on the temperature of the water.

The parasite will leave a fish about three or four days after the spots are visible if the water temperature is about 75°F, but with coldwater fishes this is very different. If the water temperature is not much more than 50°F, the development of the parasite could take three or four weeks. The fresh parasites can hatch out in about 18 hours, again according to the temperature of the water. They are not at first very active but within a few hours they can be swimming in search of a host. As each parasite could be responsible for hundreds of new ones in a few days, with a warm temperature it can be seen that it is easier to deal with this pest with tropical fishes. Having realised how the pest reproduces it is easy to devise a scheme for getting rid of it. Several changes of water can do the trick or adding chemicals to the water to kill the young parasites before they find a host. The quickest way is to keep the water up to 70°F-75°F, and change the fish to a fresh tank each day. By this means the mature cysts are washed away before they hatch and so the fish can be safe. The young parasites cannot live for more than about a couple of days if they cannot find a fish on which to feed.

I have had a garden pond for a few years but have never had the water clear enough to see the fishes. The water is green. That of several friends in just the same whilst one has a pond in which the water is crystal clear. This pond has so many water plants such as *Elodea crista*, that one can hardly see the fishes. What can I do to improve my pond water?

You have already found the solution in the pond of the friend with the clear water. Plenty of oxygenating plants will bring clear water as the green algae cannot thrive. One of the finest plants for clearing the water of algae is the one you mention, although it is now known as *Lagarosiphon major*. This fine plant grows with long brittle stems up to 4 ft. long. The leaves are darkish green and are recurved onto the stem, giving the tips a horn-like appearance. Roots can be sent down a considerable distance by a floating piece of stem. In good conditions, that is where there is a quantity of mud or mulm on the bottom, this plant will make rapid growth but if it became too thick so that one could not see the fish

it could be pruned quite easily. Another good plant is *Elodea canadensis*, but if not controlled it can become very dense and is inclined to pick up too much blanket weed. We say that this green algae is a single-celled free floating plant, but as it has two flagella with which it can propel itself about I am inclined to class this as a minute form of animal life as the construction of this pear-shaped cell is as near to an animal as to a plant.

Next year I hope to breed fantail goldfish in a garden pool. Should calico and scaled fish be bred together or bred separately?

The two varieties should certainly be bred separately. If you cross them you will only get a mixture of both types and perhaps very few good fish from either female. If the sperms of a calico fertilise the eggs of the calico female then all will be well, but if the scaled male is also in attendance when spawning takes place some of the fry could be cross bred.

When breeding Koi carp is it necessary to keep each particular colour fish on their own or can I mix the breeding fish as to colour?

It is probable that you can mix the colours of the fish for breeding as there is no doubt that from most spawnings, even of the same coloured parents, several colours could turn up. If you had a pair of real brassy ones, you could try these apart from the others to see what they turn out.

I have a smallish tank with several fantail goldfish. Is there any other creature I can add or fishes without harming the present fish and plants?

As you state that you have a smallish tank I doubt very much if you should add anything else to it. You may already have too many fish for the size of the tank. Find the area of water surface, i.e. multiply width by length, and then divide by 24. This will give you the number of inches of body length of fish which your tank will hold. There is no faster way of losing fish than by over-crowding. I know that it is possible to keep more fish than the limit I have stated by using an aerator, but although the fish will probably live they are not as likely to thrive and grow as if there were fewer fish in the tank.

Could I keep six goldfish and six golden rudd, each about five in. long, in a medium sized pond? It has a log for the terrapins to rest on.

I do not know the size of your medium sized pond. If the pond is less than 8 x 6 ft. then it has too many fishes. Remember that terrapins may not live out of doors through a bad winter and that they can take a bite from a fish if they find one a bit sluggish.

I have several fish in my pond showing white spot disease. Could I have introduced this when I added a Comet I had bought?

White spot is caused by a parasite and you could have brought in the trouble with the Comet.

Junior Aquarist

The Green Shore Crab

by Linda Gwilliams (aged 15 yrs)

THE green shore crab, scientific name *Carcinus maenas*, grows to a carapace size of four inches across; its colour varies from a light green to a very dark green or brown. These crabs are abundant on rocky shores around our coast.

I have one of these crabs which I obtained last year, during August, from Eastbourne beach. At this time he was only a quarter of an inch across, and light brown in colour; in fact I did not even know that I had collected it, until I had arrived home and found it caught up in some seaweed with other samples I had obtained. I fed him on *tubifex* worms. Often I never saw him for many hours as he was the same size and colour as some of the stones and gravel. He also hid in an old broken sea-urchin shell, only coming out when he saw the *tubifex* worms. He would then drag his catch back inside the shell.

The crab has changed his shell several times now. The first time it was quite a surprise to see that it could not go through the hole in its hiding place any more. The discarded shell was left in a very lifelike position, complete with legs, claws and antennae. This process always amazes me as in a few hours they grow to almost twice their original size. When crabs are very young, they shed their shells about every two weeks; as they grow larger the changes are from two to three months apart. An adult crab has a once-yearly moult.

I always know when it is about to change its shell again, as it hides behind a rock for much of the day, hardly eating anything. The underside of the shell, a few days before the moult, begins to split. When the split is large enough the crab backs out of it. This process is very strenuous and leaves it completely exhausted for a short time. The shell will be soft and swells to a larger size by taking in large amounts of water. The crab then grows within this new shell until the next moult. In a few days the soft shell will harden once again.

My crab now has a carapace of two inches and is about half grown. It is now very strong, and able to uproot ferns, shells and rocks, completely spoiling my aquascaping. Crabs have four pairs of legs with a long claw on the end of each leg; also a very sharp pair of pincers for catching and eating food.

Mature crabs have tufts of small hairs on their legs. My specimen is just starting to grow hairs on its legs.

He shares a 24 inch tank which is filled with synthetic

sea water with eight beadlet anemones, many limpets, barnacles and periwinkles. Brine shrimps have also hatched in the tank and are growing well, although I don't know what they feed on. The crab, in his scrambling round the tank, usually manages to overturn the rocks with the anemones attached. Being utterly helpless, I have to re-right them whenever I can. These anemones must dread the crab's shell-changes as each time he is getting stronger.

Once or twice he has managed to climb up the plastic pipe of the under-gravel filter, and sit on the top of it, I should think he likes the feel of the water gushing around him. This looks very amusing especially as the pipe must be slippery as he keeps sliding down it.

Like many other species of crab, it is unable to swim, so the depth of the water in the aquarium need not be very deep. The depth of the water in my tank is about nine inches.

The tank is kept in a room in which there is never any heating. Often the water temperature on a cold day drops to as low as 48°F. At this temperature he buries himself in the stones behind a rock and does not eat much but when the sun shines in the room on a warm day he becomes very active.

He eats almost anything now, cooked prawns being his favourite. At one time I had a few prawns in the tank, but as he grew larger he ate them. Other foods are pieces of meat, bacon and fish. He has even eaten a sultana. At one time *tubifex* worms were his favourite food but he will not eat them now, so I give him suitable pieces of food from my dinner plate. I also buy one or two prawns a week from a local fishmonger. He gets very excited when he sees food, often rolling onto his back with it. Sometimes when I drop a piece of meat or prawn into the tank which is meant for the crab, it may go off course and drop onto an anemone, which will immediately seize it. The crab will then try and pull it from the anemone. But, believe it or not, the anemone usually succeeds in keeping the catch.

Many times I have thought about giving him to the natural history section of our local museum (as they have a British Marine tank), especially after he ate the live prawns, but crabs' natural food in the wild are prawns and shrimps so I cannot blame him for that, so I think I will keep him for as long as possible to watch him grow and make further notes on his behaviour.

THE HARDY EUROPEAN REPTILES AND AMPHIBIANS IN CAPTIVITY (Part 6)

by Andrew Allen

12. The European Tree Frog (*Hyla a. arborea*).

Description.—Grows to a length of about 5 cms, with little difference in size between male and female. The dorsal surface is smooth and glossy, whilst the ventral surface is granular. Skin folds are present in the male only, when at rest. There is a very prominent tympanum. On the feet webbing extends to about half-way down the toes, which end in small adhesive discs. The male has a large yellow-brown vocal sac which can be distended considerably when croaking (to rather more than the size of the head). Dorsal coloration is a very delightful leaf green, or in certain rare cases a pastel blue. However, these shades are very variable, for the Tree frog can modify its colour in response to environmental conditions and background to several tones of grey, green and brown. Indeed, its powers of colour-change can be compared very favourably with those of the much vaunted Chamaeleon. A fine white line flanked by black very clearly separates the dorsal surface from the ventral. The latter is pure white or cream, except in the throat region of the male where the vocal sac occurs. This, the only European member of the *Hylidae*, is a very attractive and distinctive frog that offers no identification problems.

Distribution.—The Tree frog is found throughout every part of Southern and Central Europe, including Spain, Portugal, most of France, Belgium, Holland, Italy, Austria, Switzerland, Germany, Southern Scandinavia, and eastwards through the Balkans into the Caucasus and Asia Minor. Attempts to introduce it into this country have been failures. It favours a wide range of habitats, both wet (marshes, etc.) and dry, though nearly always on or near trees, shrubs or bushes.

Breeding Habits.—Courtship takes place during much of the Spring and early Summer in short, sharp bursts. The chorus of male frogs is quite noticeable! Axillary amplexus is in the water, and the female produces spawn in small clusters each containing up to a thousand eggs. The tadpole is olive coloured, and

easily identified because the hind gut is on the right of the body whilst the opercular opening is on the left, a situation different from that in both true frogs and true toads.

Care in Captivity.—The needs of the Tree frog are entirely different from those of all the other hardy Amphibians that we are considering, because its mode of life is so different. The Tree frog, with its adhesive pads, is a magnificent climber and leaper, and treats a sheer sheet of glass with contempt. As a result all vivaria must be totally escapeproof, and designed to accommodate the acrobatics of this species. The indoor vivarium should be both large and tall. Dimensions of four feet long by two feet wide by four feet high would be ideal for a group of four or five Tree frogs. Obviously this presents some problems, as standard aquaria and vivaria do not come in such sizes. But it should not be beyond the ingenuity of the enthusiast to cope with this situation and build himself a vivarium that meets these requirements. The options involved in designing the interior of such a vivarium are very wide, and the completed arrangement can be highly attractive, well fitted for a niche in lounge or hall. There should be a small pool, as these frogs enjoy a periodic bathe, especially in warm weather. In addition there must be a variety of tall plants with large leaves, preferably ones that last all year. Ivies, especially the decorative variegated varieties, can be trained up the back and sides of the vivarium, and will add to the luxuriant wealth of greenery. The position of the vivarium should be chosen with care. Unlike most Amphibians, Tree frogs enjoy a certain amount of sunlight, and will bask for long hours in its rays. But, though they should be exposed to the sun, it is also imperative that they should not receive too much, for, like all other Amphibians, they dehydrate very rapidly.

Under these conditions it is perhaps better to over-winter the frogs, rather than hibernate them artificially in a deep pile of leaves and moss placed in a cool out-house. But if you do over-winter them please remem-

ber to maintain the temperature at a suitable level. If the temperature falls too much, and in many houses there is a sharp drop each evening, then the Tree frogs will become semi-torpid, probably with fatal results. They should be kept in a room whose temperature is maintained at around 70°F both day and night, or else provided with a bulb of low wattage (25 watts would be ideal in a small vivarium). In larger arrangements several bulbs of 25 watts each should be preferred to a single bulb of high wattage, for the frogs will invariably sit on the warm surface, and a 60 or 100 watt bulb can become dangerously hot. If such bulbs are

both cases I have had a good measure of success, though in the latter instance the Tree frogs tend to spend much of their time hidden beneath ivy leaves near the ground.

Feeding is easy enough, though, if you over-winter this species, it can be rather difficult to find the requisite fare in mid-January. All flying insects will be gleefully taken, and best in this category are Houseflies, Bluebottles and the commoner moths. Old-fashioned fly-traps can be used to capture flies and their relatives, or they can be raised from the *larvae*. Neither method is particularly likely to endear you to the family! Sweepings from a grassy field or verge,



utilized they should be protected by a small cage of zinc gauze.

It should be self-evident that these frogs cannot be housed in an outdoor reptiliary. But they can be safely accommodated in both greenhouse and cold-frame—indeed these provide the most desirable of homes. Rampant vegetation and a hot, moist atmosphere can both be attained with ease, while the insulation provided in cold weather ensures safe hibernation. If kept in company with lizards, drier conditions and more ventilation will obviously have to be provided. But this need not be a deterrent, for I have accommodated Tree frogs in a very hot, damp cold-frame in company solely with frogs and newts, and in a fairly dry greenhouse with Green and Common lizards. In

using a fine-mesh net will supply a wide range of small moths and flies. Another useful idea is to place several gnat *larvae* in the vivarium water bowl and leave them to mature at their own rate. The athleticism and grace with which the frogs pursue and capture their prey will prove a constant source of entertainment and interest. When these favoured morsels are unavailable, less appetizing substitutes can be employed. Mealworms are enjoyed by some Tree frogs, but others seem to find them most unpalatable and will take them only as a last resort. Earthworms, beetles, blowfly larvae and woodlice also come into this category of food that will be taken when choicer fare cannot be offered. Variety must always be the key word, even more so than with most other batrachians.

The Tree frog is an inoffensive customer, and will cause no trouble in the community. Indoors it will safely accompany most of the newts, Fire- and Yellow-Bellied toads, Midwife, Common, Natterjack and Green toads, Common, Agile and Moor frogs. Outdoors the range is wider, and the above species can be supplemented by small and medium sized lizards, Spade-foot toads and tortoises. Snakes and terrapins are absolutely taboo. Marsh frogs and Clawed toads should be avoided. I have kept them successfully in the company of Edible frogs, but it is not a practice that I would recommend. If you do so, remember to keep the Edible frogs fully fed the entire time.

Follow these instructions and you will have little cause for complaint. This is one of the most attractive and unusual species that can be readily obtained by the amateur. It costs not too much (and only a fraction of the cost of its cousins from North America and Africa), and its habits are lively and engaging. It rapidly becomes tame, and has a reasonably long life-span in captivity. The only disadvantage that I can think of at short notice is its penetrating call-note, usually produced after a shower or on warm and thundery evenings. Please do not place the vivarium in your bedroom, or, if you welcome communal harmony, next to a thin partition wall separating yourself

and your next-door neighbour. Wars have been started on lesser pretext. You can do nothing to stop the frogs croaking, but it is wise to limit the number of males, and have a ratio of perhaps one male to every three females. But this notwithstanding, the Tree frog is an admirable species that will bring joy to all those who observe it.

The most important sub-species and one that will be encountered as frequently as the type, is *H.a. meridionalis*. It is found in much of Spain and Portugal, Southern France and North-West Italy, especially along the Riviera, the Balearic islands, the Canary islands, Madeira, and North-West Africa. The dark stripe is largely absent, extending solely from the snout to near the tympanum.

H.a. molleri is found in Calabria and Portugal. It is distinguishable from the type largely through differences in the length of the leg.

H.a. savignyi is found on islands like Corsica, Sardinia and Elba, and through Asia Minor deep into continental Asia. The stripe down the side is considerably broken, and the hip-sling is absent.

The next article deals with the Common toad, most familiar representative of the great family of the true toads.

WHAT IS YOUR OPINION?

continued from page 251

who lives at 10 Lammerview, Tranert, East Lothian, Scotland, and he asks about the red piranha. He looked up its scientific name in a variety of books and magazines, and found four different versions. He wonders what its correct name is. (Can readers give any suggestions?) When he was 13 years old, Mr. Copland kept a goldfish alive in a bowl for one and a half years. He thinks that my Discus is shy because there is too much plant life in the tank. He hopes to keep Discus or Red Oscars in the not too distant future. (I see that I could have written Master Copland, as Malcolm is only 15 years old.) Malcolm ends his letter by saying: "Keep up the good work with W.I.Y.O.!"

Photograph 3 shows the only surviving Discus from the original four young fish which I purchased at £1.00 each one year ago. The third fish of the quartet, which grew very big, died some weeks ago. You have no idea how many hours I spent with camera and flash poised to take this photograph! However, I finally got it! I was so tired of the shy Discus that I added a number of other different Cichlids to its tank. This seems to be working a "cure" as the Discus can now be seen quite often out amongst the other fishes—although it is still shy enough to hide in the plants if I approach the tank without being very quiet. The Discus is growing

well and is now a really beautiful fish. It doesn't mind its companions at all, and this morning, when I added a chunk of freeze-dried *Tubifex* to the tank, the Discus was quickly out in the midst of the other fishes tearing away at the worms. A pair of *P. kribensis* in the same tank have just laid a batch of eggs on the underside of a large stone, under which they dug a pit. I'm very interested to see what evolves! Meantime, as I'm visiting London next week for a few days holiday before school reopens, I hope to be able to buy a couple more Discus to keep mine company. Perhaps this will finally "cure" its shyness. I have reached the conclusion that it may be better to buy Discus which are not too young, as I think that they would probably settle down better in a new home. I'll keep you informed.

For the next edition, please send me your opinions on the following topics: (a) What have been your experiences with the keeping and breeding of the dwarf pencilfish—*Naunostomus marginatus*? (b) Are terrapins easy to keep and look after? (c) What are the advantages and disadvantages of breeding traps? (d) What "extra" items of equipment, etc., would one need if one wanted to convert a tropical freshwater tank, with a nylon-coated frame, into a tropical marine tank? Would this be an expensive conversion, excluding the cost of fishes? (e) Which aquarium plant—either tropical or coldwater—do you find the easiest to propagate artificially, and what is your technique?

A JUNE KOI SPAWNING

by W. David Pettit

Koi must be the most captivating and beautiful of all fish. They make the most fascinating and beautiful pets. They show great affection towards one another and will also show affection for their owner. This is particularly noticeable when they get large. I fell in love with these creatures nearly two years ago when I saw some fine imported specimens. Having kept fish of various kinds since childhood and bred many of them, I became very determined to breed these fish.

I bought some 12 in. fish eighteen months ago, and I did get a spawning but it was quite sterile. Sterile spawnings with fish at this size are relatively common. However, the fish were overwintered inside and given only six weeks cold period and when put out in May they were 15 in. or so in length. To date I have had three spawnings but I will describe the first in detail as the first time is always the most exciting.

This spawning came from English bred fish of some 16 in. in length. I had two males and two females in a 5,000 gallon pool, this pool had an abundant supply of natural live food but even so each fish was eating a handful of pellets every day during April and May. The weather was very cold but the sun came out on 3 June, and it stayed sunny until the 6 June. I went to see the fish at 10.45 a.m. and they were spawning in some larch branches placed in the pool for that purpose. I had not seen any preliminary chasing and as the water was still cool at 60°F I was rather taken by surprise.

The two males were either side of the female and pressing hard against her; many eggs were visible and I left them so that they would not be put off. I returned about half-an-hour later and the larger male, a *Shiro-Bekko* had lost interest and both he and the spare female started eating eggs. However, the other male an *Asagi*, and the female an *Ohgon*, continued to spawn.

I removed most of the eggs to save them being eaten and returned at about 2 p.m. The *Asagi*

and the *Ohgon* were both chasing still, but spawning had ceased. I removed the last eggs and put a net round the many eggs stuck to the side of the pool.

The eggs were placed in an indoor pool and the temperature was raised to 65°—70°F. Koi eggs usually hatch in three to four days, but these did not start hatching until eight days. The eggs were much larger than I had expected, being nearly twice the size of goldfish eggs. This explains the slow hatch. However, it caused me great concern at the time, especially when eyed eggs turned white; these still hatched but produced pearl-white youngsters.

The youngsters were born either white or colourless; the white ones turned gold and the colourless ones turned dark within two days of hatching. These youngsters were started on *infusoria* but were able to accept small *daphnia* at about four days old. Their growth is quite remarkable. At five weeks the largest were 1½ in. length. They started colouring at about 1 in. in length. The dark fish nearly all turned blue with metallic markings on their heads; the gold fish turned all colours. The sight of a shoal of these beautiful youngsters is really exciting especially as they change colour rapidly and marked daily differences can be seen.

The only slight feeding problem I encountered was when the *daphnia* supply was unable to cope with their appetites. They were a little reluctant to eat dried food. However, now at six weeks, they accept almost anything very greedily. They are being fed some live food still, but their staple diet is wheat germ, with crushed pellets and dried *tubifex* given for a change. They seem to have quite insatiable appetites and seeing them all eating greedily is a pleasure indeed.

Since the first spawning, I have had two others. In each case the female was over 16 in. in length. The second spawning hatched in 2½ days at 75°F, but there were only a few eggs and I only have about 50 fry from this spawning.

The third spawning was a very vigorous affair

with fish of 2 lb. and more being thrown into the air. The female was an English fish of 20 in. in length and there were 100,000 eggs or more, they were very close together and I lost many fertile eggs to fungus. Even so I have a few thousand fry. I look forward with great interest to the development of these youngsters as the males involved were the imported fish I have been coaxing for so long.

There are several youngsters in the spawning

pool and they all appear coloured. I am surprised, as much of the time the water has been very cold. As one would expect, these are still small, being about 1 in. in length at eight weeks after the spawning.

In conclusion I should like to express my gratitude for all the help and knowledge I have received from the British Koi Keepers Society. The members of this society are an enthusiastic lot and are only too willing to help with any problems.

FISH FOOD REVIEW

ELITE FISH FEEDS for tropical, and for pond and cold-water fishes, manufactured by Derhams Products, 3 Maybourne Close, London, SE26 6HQ, and distributed by Hillside Aquatics, 29 Dixon Hill Road, Welham Green, nr. Hatfield, Herts. RRP and minimum weights: Pond and Coldwater—5 oz. 17½p; Tropical—Standard 1½ oz. 12p; Economy 3 oz. 20p; and Breeders and Commercial 6 oz. 35p.

Elite has now been marketed for over 25 years and Mr. Lester Miller, senior partner in Derhams Fish Foods, believes that his is the oldest established business in Britain exclusively manufacturing fish food. Minor modifications have been made to the food's composition, over the years, to take into account new nutritional discoveries. Elite is a non-flake food, and is manufactured from: assorted meals, including beef; beef heart and liver; ewe; ewe heart and liver; fish roe; white fish; wheat germ; oils and salts. Vitamins, principally A and D, together with unsaturated fats, are added after heating and sterilisation. Elite has a mixed dry weight protein content of 52 per cent, and a minimum fat and oil content of 7 per cent.

When Elite is sprinkled on to the water surface, some particles group together for larger fishes, and some particles remain as separate entities for smaller fishes; some particles will sink to ensure equal shares for all fishes. This food can be used exclusively on its own, or in rotation with other foods such as flake foods; but it can also be used as mix for home prepared foods. The makers supply a leaflet on the preparation of home made foods, and I sent for one to see what sorts of recipes were suggested. I found that the recipes were mostly based on fresh, raw foods which should be "pulped" and then kneaded with Elite in the approximate proportion of two parts pulp to one part Elite. The resulting mixture can be pressed into single pellets which remain "soft," but do not break up in the water. This means that any uneaten food can easily be removed from the tank. "Cheese feed" and "worm crush" are two suggestions outlined, as are "snail crush" and "steak crush." (Raw fish should not be used in these preparations.) "Elite porridge" is made using oatmeal, and excess food can be stored in a

refrigerator for about a week. "Liver paste" contains oatmeal as well as liver and Elite, and can be preserved as with the porridge; constant feeding is possible as the food pellet can be left in the water for about ten hours. "Green feed" can be made from either spinach, nettles or lettuce, and is for fishes which require a high vegetable diet. "Elite blood feed" is another suggestion. All Elite crushed or cooked feeds can, if desired, be hung in the tank from a cotton thread; they can also be used to finger-tame fishes. Only very small amounts of prepared foods should be fed at one time.

The economy sized carton of Elite has recently been fitted with an interesting new lid which swivels round to provide three different food outlets; one section acts as a sifter and only allows through fine particles of food; the second is used to shake out food; and the third for pouring food out. I found the convenient "sift, shake and pour" lid to be very useful for specific purposes.

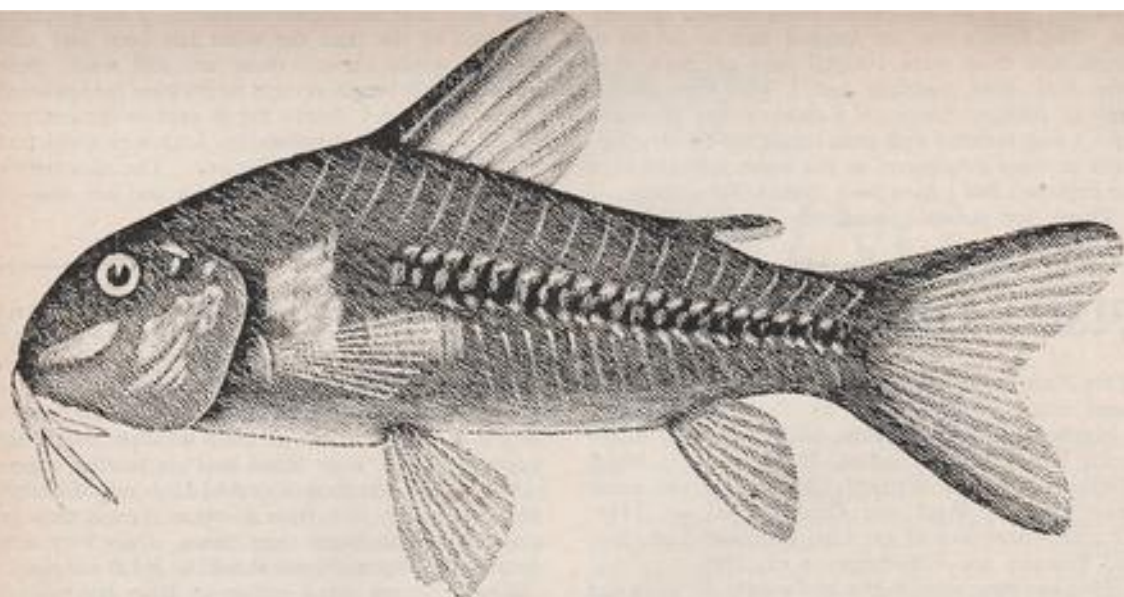
B.W.

WHAT IS IT?

by Hilary Maynard

My first is in WELL but not in DEEP,
My second is in CASTLE but not in KEEP,
My third is in BEE-STING but not in BEE,
My fourth is in BARRISTER and also in PLEA.
My fifth is in SHIPYARD but not in DOCK,
My sixth is in CLOCKWISE but not in
CLOCK,
My seventh is in PACKING but not in CRATE,
My eighth is in FISHCAKE and also in
SKATE.
My ninth is in THUNDER but not in CLAP,
My tenth is in IDENTICAL and also in SNAP,
My eleventh is in POMEGRANATE but not in
PEACH,
My twelfth is in STRETCHING but not in
REACH.
My thirteenth is in PARSIMONIOUS and also
in MEAN,
My whole is attractive, and adds to the scene.

Answer on page 279.



Corydoras nattereri

ABOUT *Corydoras* —AND FIVE IN PARTICULAR

by Bill Simms

THERE are about fifty kinds of catfishes that inhabit the streams, ponds, and rivers of tropical South America, and a goodly few of these have the name of *Corydoras*. Unfortunately, there is much dissension between the various people responsible for naming different species, often because after a fish has been named by one, it is discovered to be identical with a fish given a different name at an earlier date.

Another source of name-altering is that, on a detailed examination of a species, already named as belonging to one group because of superficial resemblances, it is discovered that it has certain features that place it in a different group, with a consequent change of its specific name. All this swopping of names does not help the aquarist who chooses his fish because he likes the look

of it, for many times he will be misled about the identity of a fish he sees or purchases.

The Leopard catfish is properly *Corydoras punctatus julii*, but is sometimes called *C. leopardus*, *C. julii*, *C. punctatus acutus*, or *C. p. leopardus*. A somewhat similar catfish is called *C. p. punctatus*, which is confusing in itself, but even more so when it is realized that its common name is Spotted catfish—which is also the common name of *C. melanistius melanistius*.

At one time, some years ago, I decided to put some order into the *corydoras* species for my own purposes; but after a few months work on the necessary research I found that the details were becoming even more confusing. I was working on nearly thirty named species (some of which were so alike that they might have been

regional variations only) and half a dozen or so newly discovered kinds that had got temporary labels like U1, U2, and U3. I gave in, and continued to struggle along as best I might.

Corydoras of all species have a similar shape, with a short body, well curved back, and straightish lower profile. Coming as they do from all sorts of freshwater habitats—ponds, ditches, streams and rivers—the various species have somewhat different requirements of temperature and water hardness for ideal conditions, with a temperature ranging somewhere around the 74°F. It is possible, however, that for most of the species we keep them too warm. It is certain that where a tank is heated from the bottom, as may be done when a large number of tanks are run together, the armoured catfishes do not appear to be so comfortable. It should be remembered that natural waters are stratified, with the colder temperatures below.

The pH of the water should be about neutral, varying slightly either side of that point. Water hardness is different with each species, but in many cases should be slightly soft. There is room for experiments here, though, for there are instances where a slight hardening of the water has improved breeding chances.

One thing is fairly certain, however, and that is the state of the bottom. There appears to be a popular belief that catfishes feed on the detritus at the tank bottom. This may be so to a slight extent, for they sort it through to find any real nutriment it may contain. The fact remains, however, that without a



C. m. melanistius

reasonable amount of proper food provided on a fairly clean bottom, these fishes do not give of their best. In the average small aquarium catfish promote the formation of deep detritus deposits through their sifting of everything movable. There are times when they stir up murky clouds over the gravel and this indicates too much debris.

To help you see them properly, and in the interests of the fish, all excessive amounts of mulm should be removed. On a clean bottom live should be provided fairly often. Do not be misled by that sweeping term "scavenger". It should be replaced by the more correct name of "bottom-feeder". Use *tubifex*, for

catfishes will root them out from the gravel when they try to bury themselves. *Daphnia* is taken eagerly when it is on the lower levels, as often happens.

Dense and extensive thickets of plants are not too popular with *corydoras*, unless it be isolated clumps of the *cryptocoryne*, for these fish should have fairly large areas of clean gravel over which to work. Their habit of hurrying forward, noses downward to the gravel, and then popping up for a gulp of air, is particularly pleasing when there is room to see them. There should be plenty of hiding places, though, and the strategic placing of rocks and small plant-clumps should



Corydoras punctatus julii

be thought out carefully to provide this cover, and to look ornamental. Too-deep water is not favoured by catfishes, so very deep tanks are not suitable.

Breeding most of the *corydoras* follows the same general pattern. A large tank is used with a few clumps of *cryptocoryne* and plenty of open spaces. In the tank should be new clean water—preferably on the hard side. It should be about 8 in. deep.

It is usual to allow three or four males to a single female, and they should be placed in the tank in the evening. Spawning usually takes place the following morning. When in condition the female will clean a portion of the floor, the side glass, or a plant-leaf with her mouth, and then approach a male who grasps her barbels with his pectoral fins. In this position her vent is opposite a pouch formed by the ventral fins of the male, and 2-4 of her eggs are fertilised by the male. Then she uncouples and fastens the eggs to the cleaned area. There are some arguments about the exact mechanics of the fertilisation process for the water around the mating fish is full of sperm from the males and this is why more than one male is necessary. It is claimed that although the female is grasped by a male on each egg-laying occasion, it is always the same male. About 200 or more eggs are laid.

There is no attempt to harm the eggs by the parents, but it is better to remove them after a good spawning for there is no attempt by either parent to care for the eggs or young. The water level should be lowered to about 4 or 5 in. at this stage. The eggs hatch in about 5 days and the hatch is usually less than half the eggs. Brine shrimps and microworms are the best food for

the newly-hatched *corydoras*, for they can take these easily. From then on the progress of the youngsters should be steady until maturity is reached at about 12 months old.

Although *corydoras* are not difficult to breed—in some instances—most of those on sale are caught fish. This allows plenty of scope for the breeder aquarist who cares to specialise in this fascinating aspect of the hobby. The Leopard catfish, the various names of which have already been given, would be a good project, for it is really popular. It grows to about 2½ in., and large adults should be chosen for the breeding attempt. Use medium hard water, slightly alkaline, and of about 74°F.

C. arcuatus



C. melanistius melanistius, which is called the Spotted catfish, together with *C. punctatus punctatus*, has smaller spots than *C. p. p.*, though the two fishes are similar in many ways. It is about 2½ in. long, and comes from the northern parts of South America, so can stand considerable ranges of temperature. I do not know of successful attempts at breeding this fish but would surmise that medium soft water about 74°F would be a good starting point.

The Bronze catfish, *C. Aeneus*, called the Aeneus catfish in America, comes from many areas of South America, and therefore there are variations in temperature according to the region where it originated. In general about 75°F seems to suit this fish, but you could try slightly higher or lower than this. The water must contain no salt at all for these catfish live in

absolutely fresh water—usually neutral to slightly alkaline, and moderately soft.

A rather well-marked catfish is *C. arcuatus*, for it is yellowish-grey, with a dense black line running along the top of the body, across the tail base, and occasionally along the bottom of the tail. In England this fish is called the Streamlined *corydoras*, while in America it is referred to as the Skunk catfish, and the Tabatinga catfish. The water for breeding this fish should be neutral to slightly alkaline, medium soft, and with no salt. It comes from the Amazon basin, which is fairly warm, and so 76°F, or above should prove to be a successful temperature.

C. nattereri, the Blue catfish, is somewhat different from the others for it shows distinct colouring, with a



C. aeneus

band of blue along its middle as well as on face patches. The main part of the body is light-brown to greenish, which is the all-over colour you would normally see it at the dealers. Given good conditions and live food, however, this fish can show its blue colouring well. It comes from farther south in South America and so can do with slightly lower temperatures for breeding. About 72 to 74°F should be correct and use medium soft water.

The water qualifications for all these catfishes are by no means rigid, and it is in the way of slight variations that the intelligent breeder can show his skill, thereby achieving success where others have failed. Try breeding some of these "cats", but do choose large adult fish, and give them plenty of room and live food.

PRODUCT REVIEWS

STERILIT NEW ULTRA-VIOLET WATER STERILISER, manufactured by C.M. Instruments, 5 Wycombe Road, Holmer Green, Buckinghamshire. Price £19—postage and packing 45p.

This new unit has been specifically designed for freshwater and marine aquaria after many years of research into the behaviour of aquarium kept fishes. This source of UV radiation in the germicidal wave-band (25374A) is designed for installation between the filter and the tank. The unit is so designed that the

water passing through it is properly exposed to the intense UV radiation, which effectively controls bacteria, viruses, algae and moulds. The specifications for the SCM 72 model are: Service capacity—100 gallons; Max. flow rate—30 gallons/hour; Power consumption—15 watts; UV lamp type TUV 15; Mains supply—240 volts a.c. (other voltages can be supplied); Dimensions—height 460 mm. and jacket diameter 75 mm. The lamp life is nominally rated 5,000 hours continuous running; the lamp does not normally burn out, and in the maker's experience much longer periods of service may be expected before

replacement becomes necessary. Lamps are easily changed when necessary. Installation is simple as there are only two water and one electrical connection required. The pH and the chemical structure of the water remain totally unaffected. The Sterilit is said by its manufacturers to be: "an invaluable accessory for every aquarium keeper who truly cares about his fish, and for anyone who aspires to the successful breeding of such notoriously 'difficult' fish as *A. ramirezi*, Chocolate Gouramies and Discus." Its use with Discus is said to be "particularly successful."

B.W.

AIR PUMPS—Some general comments.

A problem which has concerned me for some time, when reviewing air pumps, is that of not having any standard by which one can make a pronouncement on what an aquarium air pump will actually operate. If I say that a particular pump will operate one or two filters, or, say, five diffuser stones, these figures have little or no meaning. There is no such thing as a "standard" diffuser stone or filter, as they come in a variety of shapes and sizes, and each has its own air requirements. Another factor is that a diffuser stone can, like a filter, be operated with only a small amount of air, or with a medium amount of air, or with a large amount of air. Again, "small, medium and large" have little or no meaning on their own. A third factor, which affects diffuser stones, is the depth of water which a tank contains: 10in., 12in., 15in., 18in., etc. Thus, it can be seen that to quote such figures does not really give accurate information unless many qualifications are made—and these can make things so complicated that one could end up with no one understanding what is meant. My point of view was confirmed in a recent letter from Mr. E. J. Small, the proprietor of Hillside Aquatics, who wrote: "It is a great pity that there cannot be a standard for testing aquarium pumps." With so many different aquarium pumps now on the market, I feel that it would be to the advantage of their manufacturers if they could get together and decide upon some standard tests which could be applied to all pumps. I would be interested to hear manufacturers' opinions on this suggestion. I recently obtained leaflets on the following new air suppliers for aquarium use.

WISA AQUARIUM PUMPS—Models 300, 200 and 120. The Wisa Model 300 costs £20, but I do not yet know the prices of the two smaller models. The Wisa range is distributed by Hillside Aquatics, 29 Dixons Hill Road, Welham Green, nr. Hatfield, Herts.

The Wisa 300 is described as "the most powerful vibrator pump in the world," and is manufactured in Germany. The manufacturers give output details for the pump operating airstones at a depth of one metre—"50-75 jets"—but it is unlikely that anyone in Great Britain has many tanks of such a depth. The 300 model

has an adjusting knob to regulate the air output, and is said to produce only a slight noise even when working at full power—when its current consumption is only five watts. When working at lower output levels, the pump is said to be "noiseless." Replacement parts are easily fitted, and normally this job only needs to be done after three or four years. Like the two smaller models, the Wisa 300 is ozone resistant. It has a performance rate of 300 litres of air per hour at a counter-pressure of 1m. column of water. The Wisa 200 is similar to the 300, but does not have a regulator. Its performance rate is 200 litres per hour. The Wisa 120 resembles the 200 model, but has an output of 120 litres of air per hour at a counter-pressure of 1m. column of water.

THE OCEANAIR MAJOR AND MINOR blower unit costs, respectively, £87.30 and £76.80, and are manufactured by the Oceanair Manufacturing Co., Lancaster. They are distributed by Interpet, Curtis Road, Dorking, Surrey, RH4 1DP.

The Oceanair Major blower unit has been manufactured to meet the requirements of the aquatic retailer who has between 30 and 100 tanks. Under test by the manufacturers, the unit has supplied air to 300 airstones at a depth of 3ft., using ½in., 1½in. and 2in. bore plastic piping, on a run of 175ft.

The Oceanair Minor blower unit is designed to meet the requirements of the small aquatic retailer or the aquarist with a large fish house. Under the manufacturer's tests it has supplied air to 100 airstones at depths of up to 18in., using plastic tubing of diameters varying from ½in. to 2in., on runs of up to 175ft.

B.W.

Crossword Solution

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

Answer to What Is It?: **WATER WISTARIA**

OUR READERS WRITE

Green Tench

In Readers' letters in *The Aquarist*, August, 1972, Mrs. S. A. Fox asks how large Green Tench (*Tinca tinca*) have to be before they breed. I do not know what size they are in a natural pond but I have bred with them when two years old. In 1947 I bred from Green Tench in my garden pond and kept some of the younger ones. These were well fed and grew very rapidly. They spawned in 1949, when I was able to dispense with the old fish, each about a pound in weight, and kept the young ones. Tench are very vigorous chasers when spawning and with me were always late in the year. I have bred them for many years but never remember having a spawning before July. As the close season for coarse fishing ends on June 15th I wonder if many tench are caught before they have spawned?

A. BOARDER,
8 Mead Way,
Ruislip,
Middlesex, HA4 7QW.

Cichlid Hybrids?

I am sixteen years old and I have been keeping tropical fish for six years. My brother and I have four tanks ranging from 18 in. to 4 ft. Recently I acquired a 1½ in. Jack Dempsey which was introduced into a 4 in. tank containing various cichlids.

For the first three months it was victimised by a large male blue acara. As it grew bigger and developed strong blue coloration, the acara stopped attacking it. Instead it used to quiver and flare its fins, showing beautiful colours whenever it was nearby. When the Dempsey reached 4 in. it had developed large points on both its anal and dorsal fins. At this time my conclusion on the behaviour of the acara was that it was territorial aggression to another male. Three weeks later I was proved wrong. The Dempsey was now solid black with royal blue patches on the gill plates. He kept up this stunning coloration and began to dig pits round a large cave in which he and the acara showed interest.

A day later, to my total amazement, I witnessed the Dempsey, which was a male by most text books on cichlids, lay about 100 eggs on the outside of the cave

and about 50 on two pebbles in the cave. The eggs outside the cave were eaten but the ones inside are still intact at the time of writing. Another point worth mentioning is that the male of the pair (the acara) does all the looking after the eggs while Dempsey stands guard over the cave. This is usually the other way around in normal circumstances.

Since I had never heard of these two fishes spawning together I thought it might be a worthy contribution to your excellent magazine.

P. W. CUTBUSH,
Pack House,
Column Road,
Caldy,
Wirral, Cheshire.

Discus

I have read with great interest the articles about Discus and I would like to hear from someone who has tried keeping and breeding this fish.

Also, can you please tell me of an up-to-date book that I can get to find out how to set up a tank and that will tell me all about Discus.

J. COUSIN,
2 Crossland Avenue,
Holland Street,
Hull,
E. Yorks.

Have you read

The Fighting Fish of Siam

by F. N. Ghadially

Summary of Contents

The Fighting Fish in the Aquarium. Breeding the Fighting Fish. Diseases of the Fighting Fish. Colour and Colour Inheritance in the Fighting Fish.

20p
Post free

Exotic Egg-Laying Fishes

by Jack Hems

Summary of Contents

General Requirements: Keeping and Breeding. Catching and Transporting Fishes. The Characin Family. The Catfishes. The Cyprinid Fishes. The Cichlids. The Cyprinodont Fishes. The Labyrinth Fishes. The Atherinidae. Some Diseases of Exotic Fishes. The Aquarium.

15p
Post free

These are available from:

THE AQUARIST AND PONDKEEPER
THE BUTTS, HALF ACRE
BRENTFORD, MIDDLESEX

Tropical Fish Pests in North American Waters

by Gunther H. Radek

THE human immigrants named North America "God's own country" for its richness and for unlimited chances to get "the right elevator up." Naturalists and especially Ichthyologists, found that tropical fish could become established in U.S.A. as well. For example, cichlids, a rather large family of tropical fishes of about 900 species found mainly in Central and South America, are newcomers to U.S.A. (*Tropical cichlids!*). The cichlids are popular among aquarists and are probably kept for their brilliant colours and interesting breeding behaviours! Last, not least, they are hardy species.

There is no doubt that more species than we are aware of have been released by hobbyists whose pets outgrow the container or are escapees from tropical fish dealers, especially in Florida. These introductions are senseless and the survival possibilities of cichlids is to be compared with the early carp introductions in the United States.

The cichlids are much more tolerant and adaptive to environmental circumstances than one suspects.

Populations finding refuge in many of North America's natural warmer, southern waters, warm springs or even in such artificial water sources as areas of thermal pollution, may eventually establish and distribute themselves over most of the Southern States.

Seven species, apparently, are established in North America. The black acara—*Aequidens portalegrensis*—and the oscar—*Astronotus ocellatus*—are imports from South America and established in canals and waterways of Florida. The convict cichlid—*Cichlasoma nigrofasciatum*—a central American import lives in ponds about Miami, in two springs in Nevada and even in a hot spring at Banff, Alberta. *Cichlasoma severum*, the banded cichlid, a South American species, was released in Roger Spring, Nevada. The jewelfish—*Hemichromis bimaculatus*—a colourful African species of the fish fancier, is known to be in a canal in south Florida and also near the Miami airport. Another native of Africa, the blackchin mouthbreeder—*Tilapia melanotheron*—is well established in the Hillsborough Bay area of Florida. *Tilapia mossambica*, a species native to Africa also, better known as Mozambique mouthbreeder is established in Texas, in a warm spring pond in Montana and was listed as released in Alabama.

Other species of cichlids are known to have been

released but no data are currently available concerning their reproduction.

All these cichlids adapt both to fresh and estuarine waters and their predaceous habits make them rather competitive to native North American bass and sunfish.

The most harmful introduction to North American waters, is not a cichlid but a catfish, *Clarias batrachus*. The species belongs to the family Clariidae—air-breathing catfishes. By accessory respiratory organs, in addition to gills, the fish is able to utilize atmospheric air. Representatives of the family are found in the warm waters of Africa and southeast Asia. *Clarias batrachus*, the walking catfish, has a native distribution from India to the Philippines, where it lives in swamps, ditches, canals, lakes, and rivers. It is an aggressive omnivorous feeder, thriving on the available food supply and in turn is sold in the markets.

Albinism is fairly common in this species and so the pale pink smaller specimens have been sought by aquarists for years. The accidental release of the walking catfish in southern Florida, from outdoor holding ponds of local aquarium dealers, may be the most harmful introduction to any North American area so far witnessed because of its severe competitive habits. In the past few years it has become abundant from Ft. Lauderdale northward to Lake Okeechobee and West Palm Beach. This species is out of control and there is no practical method of eradication. Its invasion of the Everglades, northern Florida, and Georgia and perhaps the Gulf Coast states westward to Texas, is inevitable because of its prolific reproduction, rapid growth, ability to maintain itself in dense populations, and to distribute itself easily by many inter-connecting natural or man-made waterways, or even by land. This catfish is tolerant to high salinities also. This aggressive species has no natural competitor in Florida. It can move considerable distances overland, especially on damp or rainy nights and easily occupy new water systems. In its voracious food habits it competes with the native food and game fishes. Small natural ponds from which the walking catfish has been seined in Florida, produced up to 3,000 pounds of the species per acre. There is no current American market for its flesh. Biologists and conservationists raised the alarm and much publicity was accorded to it with the result that demand and prices for it rose in aquarium shops.



THE MALAYAN BURROWING SNAIL

by S. M. H. Loquens

INDIGENOUS to the Malay Archipelago, *Thiara tuberculata*, commonly known as the Malayan Burrowing, Livebearing or Mud snail, is undoubtedly one of the few genuinely useful snails available to aquarists today. The characteristic spiral shell, mottled greenish-brown coloration, finely streaked with small darker markings, gives the snail an especially pleasing appearance.

The snail, which attains an overall shell length of 2-2.5 cms. is capable of quite rapid movement. This movement is carried out by powerful muscular contractions of the snail's foot and is observable as it passes across the aquarium glass. The ease with which it can draw itself into the gravel accounts for its well deserved name.

In the aquarium, the snail spends most of the daylight hours in a fairly inactive state, buried in the gravel. At night, however, this situation is reversed and the aquarium becomes the scene of much activity. At such times, snails will be found travelling about with surprising rapidity in search of food particles. Uneaten food that would probably otherwise decay, is thus conveniently disposed of. In addition to this, valuable work is carried out due to the snail's burrowing action. Small particles of detritus, which would otherwise accumulate upon the gravel, tend to be dragged down whilst the snail is burrowing. Material brought below the gravel in this way, is therefore disposed of much more quickly, being made more readily available for bacterial breakdown. This action can be compared with that carried out by earthworms which dispose of large numbers of leaves in a similar manner.

It is unlikely that plant roots are disturbed by this, rather, they benefit from the extra matter brought into their immediate proximity.

Thiara tuberculata, being livebearers, possess separate sexes (Heterosexual). This is an interesting

physiological feature, as most snail species do not show this, possessing both male and female organs within the same individual (Hermaphrodite). Whether or not the snail actually gives birth to living young is a debatable point. It is quite possible that it produces eggs which hatch almost immediately upon laying, as is the case with certain viviparous reptiles. Nevertheless, the snail is prolific and it is a good idea to periodically thin them out. In this way a state of harmonious equilibrium can be maintained within the aquarium. The danger of an accumulation of calcium from discarded shells, and the possible toxic effect this may have, can, therefore be averted. The detrimental effects of this should always be borne in mind where other prolific snail species are kept.

It will also be found wise to remove these snails, or any other active species for that matter, from aquaria containing young fish. This is because, being such avid feeders, they will consume a vast amount of food that would otherwise have been available to the young fish. It is quite surprising the volume of food that they can consume, especially when small regular feeds are made, as would be the case in aquaria containing young fish. It is unlikely that they would completely deprive youngsters of food, but it is certainly unnecessary to feed another set of mouths.

Finally, one should remember that although *Thiara tuberculata* is a pretty industrious creature, it cannot be expected to keep an aquarium sparkling clean. As experience is gained by the home aquarist, it quickly becomes evident that there are far more factors involved in keeping a balanced aquarium, than just snails. The aquarist should therefore remember, at all times, to carry out routine aquarium maintenance, in spite of the presence of this interesting species.



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.

THE Leicester A.S. held a successful Show and Exhibition at the City of Leicester Show in August. Many thousands passed through the tent in which the Show was staged, and much interest was shown. The winners in the Furnished Tropical Aquaria were as follows: 1, C. Carrwright; 2, M. Witham; 3, J. Williams. Cold Water Furnished Aquaria: 1, H. Bakes; 2, G. Pepper; 3, Master I. Robertson. Best Tropical Fish in Show: Mrs. A. Walker. Best Cold Water: G. Pepper. The speaker for August was D. Bennett, of Birmingham, who spoke about what a judge looks for when judging. This was illustrated with slides and was most interesting.

TWO club members of long-standing membership, H. Berger and M. Brill, covered the **Hford & District A. and P.S.** August meeting. The subject was Show Standards and Judging techniques of both coldwater and tropical fishes. The former was dealt with by Mr. Berger who also used a number of his prize-winning pond fishes as examples of typical standards and pointings that can be achieved.

Dates for the Home Aquaria Competition were announced and also the All Classes Table Show, which is to be held at Fulwell Cross Library, Barkingside, on Saturday, 21st October, and will be open for visiting by the general public during the afternoon.

The monthly table show results were:—A.V. Cichlid: 1, 3 and 4, W. Rowe; 2, Mrs. P. Reade. A.V. Tropical Plant: 1 and 3, Mrs. P. Reade; 2 and 4, W. Rowe. A.V. Coldwater Plant: 1 and 3, Mr. Dixon; 2 and 4, W. Rowe.

IN July and August the **Bristol Tropical Fish Club** were fortunate in being provided with two outstanding speakers. The first was B. Evans who, together with a fellow member from Weston-super-Mare, presented a show devoted to a wide spectrum of tropical fish they had kept and found of special interest. The quality of presentation and slides were a lesson in themselves and it is hoped to encourage a return visit in the not too far future. During the interval a table show was held with the following results: Labyrinth, Open and Novice: 1, K. Gray; 2 and 3, N. Gray. Angels, Open and Novice: 1 and 3, N. Gray; 2, Mrs. K. Martin.

The August meeting was indeed rather special, the guest speaker being R. Skipper from the House of Fishes, the authority on Discus. His subject naturally was his speciality aided by slides he had himself photographed and which all added up to a truly professional lecture. The club would like to repeat their thanks for the care taken in his presentation and travelling the considerable distance from Hemel Hempstead to appear at the meeting. The interval table show provided the following results: Dwarf Cichlids, Open and Novice: 1, 2 and 3, N. Gray. A.O.V. Cichlids, Open and Novice: 1, 2 and 3, N. Gray.

THE W.K.F.B.A.S. will now be known as the **Chelmsley A.S.** Meetings take place monthly at 8 p.m. on the last but one Thursday of each month. Meetings are to be held at Alder Hall, Alder Drive, Chelmsley Wood, Birmingham. Committee were elected to the new club as follows: president, R. Hadley; vice-president, B. Brittle; chairman, G. Nobble; secretary,

R. Healey; treasurer, G. Cox; show secretary, S. Tromans; news editor, P.R.O., E. Williams; committee: J. Mayle; J. Hainsley; I. Mills; J. Cox; P. Mayle.

The **W.K.F.B.A.S. Open Show** was a great success with over 500 fish benched which was double the first year show. The Inter-Society Cup was won this year by Nunston A.S.

WINNERS of the Table Show on Egglayers at the August meeting of the Banbury & District A.S. were: 1 and 5, C. Sykes; 2, P. Hill; 3, L. Poole; 4, S. Plumb.

Next meetings are on 8th and 22nd October at the new venue, The Clubroom, Wheatsheaf Inn, George Street, Banbury. New members always welcome.

ALTHOUGH Hastings & St. Leonards A.S. who were the guests of Beshill A.S. were beaten on the show bench they managed to win the inter-club quiz. J. Matheson of Tonbridge judged the fish. Mr. French, a breeder of repute from nearby Warbleton, was host to a visiting party of club members. He has been particularly successful with neons and cardinals. The Society were pleased to welcome for a second time P. Cottle (a successful exhibitor) who gave a lecture on labyrinths. Table Show results: Characins: 1 and 3, J. Stevens; 2, H. Carey. Labyrinth: 1 and 3, H. Carey; 2, C. Ransel.

THE Portsmouth A.S. Open Show and Exhibition attracted over 400 entries, more than 100 reptiles, amphibians and water life specimens.

Although the tropical entries were slightly down on last year, thirteen coldwater classes attracted a record entry. The judges, Misses Baker, Brown, Hison and Ginger, F.B.A.S., awarded Best Fish in Show to a fine specimen of a Glowlight Tetra, owned by S. Crabtree, and Mrs. Lee won the F.B.A.S. Championship Trophy for Class E.

Key to Clubs: Basingstoke, Ba; Brighton, Be.; Carassius, C.; Gosport, Go.; Goldfish Society Great Britain, GS.; Havant, H.; Mid-Sussex, MS.; Portsmouth, P.; Salisbury, SA.; Southampton, SO.

Class Results: Inter-Club Tropical Furnished Aquaria: 1, Portsmouth A.S.; 2, Gosport A.S. Inter-Club Coldwater Furnished Aquaria: 1, Carassius Club; 2, G.S.G.B.; 3, Portsmouth A.S.

Individual Coldwater Furnished Aquaria: 1, Mrs. P. Whittington (GS.); 2, Mrs. L. Howard (P.); 3, Miss W. Ryder (P.); 4, J. Lamboll (P.). Individual Tropical Furnished Aquaria: 1, D. Haines (GO.); 2, Mrs. L. Howard (P.). Individual Marine Furnished Aquaria: 1 and 2, J. Lamboll (P.). Individual Junior Tropical Furnished Aquaria: 1, Master P. Watt (H.). Individual Junior Coldwater Furnished Aquaria: 1, Miss J. Lamboll (P.); 2, Master S. Gifford (P.). Barb: 1 and 4, B. Binson (BA.); 2, D. Emery (MS.); 3, Mrs. T. Harvey (P.). Hyphessobrycon, Hemigrammus and Cheirodon: 1, S. Crabtree (H.); 2, B. Binson (BA.); 3, L. Penn (P.); 4, A. Tull (SA.). A.O.S. Characin: 1 and 2, P. Sparshatt (H.). 3, L. Penn (P.); 4, Mrs. B. Lamboll (P.). Angels: 1, A. Tracey (GO.); 2, N. Davis (H.); 3, K. Clough (GO.); 4, E. Binstead (P.). Apistogramma, Pelmatochromis and Nannacara: 1 and 2, F. Willis (P.); 3, M. Strange

(BA.); 4, L. Penn (P.). A.O.S. Cichlid: 1, M. Strange (BA.); 2, L. Penn (P.); 3, D. Haines (GO.); 4, D. Riley (H.). Betta Splendens: 1, K. Rees (GO.); 2 and 3, R. Clough (GO.). A.O.S. Labyrinth: 1, Mrs. M. Tee (MS.); 2, N. Davis (H.); 3, A. Tull (SA.); 4, E. Binstead (P.). Daplaying Tooth Carp: 3, A. Houghton (GO.); 2, Miss J. Lamboll (P.); 3, D. Haines (GO.); 4, A. Denton (P.). A.O.S. Catfish: 1, D. Emery (MS.); 2, M. Strange (BA.); 3, E. Binstead (P.); 4, B. Binson (BA.). Corydoras-Brochias: 1, Miss F. Etheridge (GO.); 2 and 4, R. Adams (SA.); 3, Mrs. J. Stillwell (P.). Rasbora: 1 and 4, P. Sparshatt (H.); 2 and 3, D. Tucker (SA.). Danio W.C.M.M.: 1, Master P. Watt (H.); 2 and 3, S. Crabtree (H.); 4, R. Rice (BR.). Loach: 1 and 3, S. Crabtree (H.); 2, N. Davis (H.); 4, T. Blanchard (SA.). A.O.S. Egglayer: 1, A. Denton (P.); 2, K. Rees (GO.); 3, K. Clough (GO.); 4, P. Sparshatt (H.). Male Guppy: 1 and 3, D. Riley (H.); 2, D. Tucker (SA.); 4, M. Mansbridge (SO.). Female Guppy: 1, M. Mansbridge (SO.); 2, D. Riley (H.); 3, D. Tucker (SA.); 4, Mrs. B. Lamboll (P.). Swordtail: 1, D. Haines (GO.); 2, D. Riley (H.); 3, D. Tucker (SA.); 4, R. Adams (SA.). Platy: 1, D. Tucker (SA.); 2 and 3, A. Megham (BR.). Mollie: 1, N. Davis (H.); 2, A. Megham (BR.); 3, D. Tucker (SA.); 4, L. Holter (P.). A.O.S. Livebearer: 1, B. Binson (BA.); 2, M. Mansbridge (SO.); 3, M. Bance (BA.); 4, S. Crabtree (H.). Common Goldfish: 1, R. Adams (SA.); 2, Miss W. Ryder (P.); 3, Miss F. Leach (GS.); 4, Mrs. P. Whittington (GS.). London Shubunkin: 1, 2 and 3, Mrs. P. Whittington (GS.); 4, D. Stokes (P.). Singletail: 1 and 2, R. Whittington (GS.); 3 and 4, W. Leach (GS.). Comet: 1, V. Hunt (P.); 2, Miss W. Ryder (P.). Veiltail: 1, J. Bundell (P.); 2, K. Johnson (H.). Fantail: 1 and 2, Miss J. Leach (GS.); 3, V. Hunt (P.). Globe Eye: 1, J. Lamboll (P.); 2, W. Leach (GS.); 3, D. Stokes (P.). A.O.V. Fancy Goldfish: 1 and 2, W. Leach (GS.); 3, J. Lamboll (P.); 4, Master S. Gifford (P.). Leather Mirror Carp, Golden Rudd, Tench and Orfe: 1, Mrs. J. Stillwell (P.); 2 and 3, W. Ryder (P.). Koi Carp: 1, E. Binstead (P.); 2, K. Johnson (H.); 3, Mrs. J. Stillwell (P.). Centrarchidae: 1 and 2, E. Binstead (P.); 3, V. Hunt (P.); 4, R. Whittington (GS.). A.O.S. Coldwater Fish: 1, 2 and 4, V. Hunt (P.); 3, Mrs. J. Lane (—). Breeders, Tropical Egglayer: 1, E. Willis (—). 2, M. Strange (BA.); 3, S. Crabtree (H.); 4, Master P. Watt (H.). Breeders (Livebearer): 1, S. Crabtree (H.); 2, M. Strange (BA.); 3 and 4, B. Binson (BA.). Breeders (Guppy): 1, Mrs. J. Stillwell (P.). Breeders (Coldwater): 1, Mrs. P. Whittington (GS.); 2, R. Whittington (GS.); 3, D. Stokes (P.); 4, Master K. Holmes (H.). Rooted Plants: 1, K. Clough (GO.); 2, W. Ryder (P.); 3, T. Blanchard (SA.); 4, Mrs. J. Stillwell (P.). Plant Cuttings: 1 and 2, Mrs. J. Stillwell (P.); 3, T. Blanchard (SA.); 4, J. Hopping (—). Floating Plants: 1 and 3, E. Binstead (SA.); 2, M. Strange (BA.); 4, R. Adams (SA.). Highest Points Club Member: Mrs. J. Stillwell.

IN August the **Tonbridge and District A.S.** had a club meeting at which C. West from Mid-Kent A.S. gave a very interesting talk on Rasbora. During the evening Mr. West answered a number of questions on all types of fish. The table show results were: Class O/P Guppies: 1, 2 and 3, K. Shoebridge. Class G A.O.S. Cats: 1, J. Bellingham; 2 and 4, D. Baker; 3, F. Farnell.

EARLY in August the chairman of the **Brighton and Southern A.S.**, A. Dawes, warmly welcomed Dr. N. Carrington of Inter-Pet (Dorking), who lectured on water chemistry and general fish care. Dr. N. Carrington demonstrated a piece of equipment that measured hardness in water and how this could affect fishes.

During the evening there was an auction and also a table show for A.O.S. Livebearers and A.O.S. Egglayers.

Any further information may be obtained from the secretary, Chris Corbin, 80 Marlborough Drive, Burgess Hill, Sussex, Tel: 41632.

MEMBERS of the Welbeck A.S. Castleford would like to thank Philip Moorhouse for giving a very interesting talk, at their July meeting, on the showing and show standards of tropical fish. He also judged a small table show, results being as follows: Catfish: 1 and 2, P. Baker (Best in Show); 3, G. Newbould. Loaches: 1, P. Baker; 2, J. Baker; 3, A. Barrett. Killifish: 1 and 2, Mr. Hoare. Juniors: 1, P. Baker; 2, A. Barrett; 3, J. Baker.

Meetings are held on the third Wednesday of each month at the British Legion Club, Welbeck Street, Castleford, at 7.30 p.m. Any new members wishing to come along will be made very welcome.

THE subject for the meeting "Are the experts always right?" provided the Heistold A.S. with an evening of controversy. The questions, from current periodicals, were put to the floor and these answers were then compared with the one given in the magazine. Once again it was shown that there can be several correct answers to the most seemingly simple question. Meetings are held on the second Monday of the month at 7.45 p.m. at the Bishopson Parish Hall.

MEMBERS of 28 clubs benched 519 exhibits at Tonbridge and District A.S. first open show. The judges were W. Wilson, G.S.G.B., and Messrs. Ellis, Jeffs, Nicholl, Tomkins and Towell, F.B.A.S. Class results were as follows: Class B: 1, J. Boss (E.L.A.P.A.); 2, P. Cottle (N.K.A.S.); 3, J. Parker (N.K.A.S.); 4, Mrs. D. Cruickshank (Ealing). Class Ba: 1 and 3, J. Bellingham (Tonbridge); 2, J. Marshall (Medway); 4, P. O'Bryan (Thurrock). Class C: 1, P. Coyte (Independent); 2, J. H. Boss (E.L.A.P.A.); 3, T. Hine (Tonbridge); 4, R. Taylor (Tonbridge). Class Ca: 1, D. M. Dare (Independent); 2, P. Coyte (Independent); 3, Mrs. M. Nethersell (Riverside); 4, Mrs. B. Scates (Brith). Class D: 1, A. Kinsey (Independent); 2, B. Wright (Thurrock); 3, Mrs. I. Bellingham (Tonbridge); 4, Mrs. M. Nethersell (Riverside). Class Da: 1, P. O'Bryan (Thurrock); 2, D. Dare (Independent); 3 and 4, B. Silvester (N.K.A.S.). Class Db: 1, L. J. Brazier (Sudbury); 2, P. Vicker (E.L.A.P.A.); 3, R. Howes (Independent); 4, R. Rock (Thames). Class E: 1, D. Dare (Independent); 2, J. Blackwell (Caterham Nomad); 3, C. Marsh (Medway); 4, P. O'Bryan (Thurrock). Class Ea: 1, S. W. Applin (Independent); 2, R. Howes (Independent); 3, C. Wood (N.K.A.S.); 4, B. McQuade (Int. Beta Congress). Class F: 1 and 2, B. L. Wright (Thurrock); 3, J. Bellingham (Tonbridge); 4, P. Cottle (N.K.A.S.). Class Fef: 1, P. Cottle (N.K.A.S.); 2, J. Bellingham (Tonbridge); 3, J. Blackwell (Caterham Nomad); 4, I. Mathieson (Tonbridge). Class G: 1, P. Marsh, Sr. (Ealing); 2, P. Farnell (Tonbridge); 3, Mrs. M. Nethersell (Riverside); 4, Mrs. S. Mason (Independent). Class H: 1 and 3, C. J. Martin (N.K.A.S.); 2, P. Marsh, Sr. (Ealing); 4, Mrs. M. Nethersell (Riverside). Class I: 1, P. Stapley (Hastings); 2, B. George (Mid-Kent); 3, P. O'Bryan (Thurrock); 4, Mrs. G. Carter (Bracknell). Class K: 1, R. Bosses (Independent); 2, G. West (Mid-Sussex); 3, J. Wood (Reigate and Redhill); 4, P. Morge (Blechnley). Class L: 1, Mrs. B. Martin (N.K.A.S.); 2, T. Cruickshank (Ealing); 3, M. Carter (Bracknell); 4, J. Blackwell (Caterham Nomad). Class M: 1, R. Goodson (Rochampton); 2, Mrs. M. Nethersell (Riverside); 3, J. London (Thurrock); 4, R. Howes (Independent). Class W (b-m): 1, C. Martin (N.K.A.S.); 2, R. Taylor (Tonbridge); 3, T. Adams (Hastings); 4, B. Silvester (N.K.A.S.). Class X (o-o): 1, L. Brazier (Sudbury); 2, I.

Mathieson (Tonbridge); 3, Mrs. M. Nethersell (Riverside); 4, K. Saxby (N.K.A.S.). Class O: 1, J. Murphy (Anson); 2, K. Shoebridge (Tonbridge); 3, A. Wood (Sudbury); 4, Miss H. Quennell (E. Dulwich). Class P: 1, K. Shoebridge (Tonbridge); 2, Mrs. V. Marsh (Ealing); 3, P. Coyte (Independent); 4, Mrs. S. Mason (Independent). Class Q: 1, J. Furber (Thurrock); 2, P. O'Bryan (Thurrock); 3, B. Wright (Thurrock); 4, T. Cruickshank (Ealing). Class R: 1, Mrs. D. Cruickshank (Ealing); 2, R. Howes (Independent); 3, B. Wright (Thurrock); 4, J. Blackwell (Caterham Nomad). Class S: 1 and 3, Mrs. M. Nethersell (Riverside); 2, P. Morge (Blechnley); 4, P. Floyd (Sittingbourne). Class T: 1, K. Quennell (E. Dulwich); 2, L. Brazier (Sudbury); 3, D. Sutton (E. Dulwich); 4, J. Murphy (Anson). Class U: 1, 2 and 4, V. Voysey; 3, Mrs. S. Sones (Tonbridge). Class W: 1 and 2, V. Voysey; 3, R. Parker (N.K.A.S.); 4, V. Valley. Class X (b-m): 1 and 2, P. Vicker (E.L.A.P.A.); 3, T. Adams (Hastings); 4, J. Boss (E.L.A.P.A.). Class X (o-o): 1, 2 and 3, J. Marshall (Medway); 4, K. Quennell (E. Dulwich). Class Z: 1, T. King (Brith); 2, W. Woodward (Pretalence). Class Za: 1, Mr. and Mrs. Burtles (Mid-Sussex); 2 and 4, C. Elliott (Medway); 3, J. Marshall (Medway).

RECENTLY the Sittingbourne and District A.S. has had a busy time. In early June Dr. J. B. Leeming gave an excellent talk on the treatment and distribution of the local water supply illustrated by a colour film on the subject. During the latter part of the month there was a table show for Guppies and Molies. This was judged by D. Simpson and the results were as follows: Guppies: 1, B. Newman; 2 and 4, Mrs. J. Simmonds; 3, P. Floyd. Molies: 1 and 3, P. Floyd; 2, J. Welby; 4, Mrs. E. McDonald. July started with a very good talk by I. Mathieson on fish diseases, life foods and feeding, and the month ended with a table show for the Sittingbourne and District A.S. Challenge Cup, Junior Challenge Cup and Novice Cup. These awards are open to all fish classes and it was very ably judged by B. Clare of the Medway A.S. The results were as follows: Winner of the Challenge Cup and Junior Challenge Cup: Master L. Bean. Winner of the Novice Cup: Mr. C. Pelt.

THE Aberdeen A.S. held their annual general meeting in April. The president is D. Strachan and the vice-president A. Sosser. The Society meet in the Y.M.C.A. Rooms, Union Street, at 7.30 p.m.

FILTRATION was the subject of a very interesting talk given to The Independent A.S. in July by Victor Sworby. In the same month the Independent was host club to the N.W.L.G.A.S. This night also turned out to be the Independent's ladies' night. Three of the lady members took first prizes, and Mrs. S. Mason won the Best Fish in the Show. The month of August and most of September were almost blank for the club, but has now recommenced at the Holloway Institute, Barnaby Secondary School, Eden Grove, Ilington, N.7.

THE British Koi Keepers Society held their second annual general meeting at Alexandra Palace during the Aquarist and Pondkeeper Fishkeeping Exhibition. The chairman welcomed about fifty members present, including a vice-president of the Society, A. Evans, also Mr. Cluse, president of the Goldfish Society of Great Britain. Mr. Cluse addressed the meeting and expressed the hope that both Societies being concerned with coldwater fish, could co-operate to mutual advantage. Officers and committee members were then elected and in appreciation of his past services, the retiring chairman, K. D. Fawcett, was unanimously voted president.

For members, the highlight of this particular show was the first occasion on which the British Koi Keepers Society had its own stand. This proved a great success and many new members were enrolled. The next society stand will be at the forthcoming British Aquarist Festival, Belle Vue, Manchester, on 14th and 15th

October. The secretary of The British Koi Keepers Society, Mrs. H. M. Allen, 1 Anthony Close, Peterborough, PE1 3XU, will be pleased to forward all details of membership and subscriptions to anyone interested in Koi keeping.

THROUGH the summer Weymouth and District A.S. meetings held on the first Tuesday evening of each month at 8 p.m. at the Assembly Hall, The Waverley Arms, Weymouth, have been well attended. A coach was hired for the Aquarist Exhibition at Alexandra Palace, and there has been a jumble sale to help raise club funds.

In response to the growing interest in marine fishkeeping the Society has formed a marine section which meets at the New Inn, Portland, 8 p.m., third Tuesday of the month. Table show results for July were: A.O.V. Coldwater: 1 and 2, J. White; 3, A. Worth; 4, M. Squibb. Pairs: 1 and 2, D. Fitzgerald; 3, M. Medway; 4, Ellen Fitzgerald, *inc.* Table show results for August were: Loaches and Botia: 1, D. Kelly; 2, M. Squibb; 3, R. Peet; 4, R. Fitzgerald. Sharks: 1, M. Medway; 2, D. Fitzgerald.

RESULTS of the Stroud and District A.S. open show were as follows: Common Goldfish: 1, T. Hampshire (Bristol); 2, R. Phippen; 3, Miss A. Brooks (Gloucester). Shubunkins: 1 and 2, Miss C. Rupert (Port Talbot); 3, C. Giles (Bishops Cleeve). A.O.V. Goldfish: 1, C. Giles (Bishops Cleeve); 2 and 3, Miss C. Rupert (Port Talbot). A.O.V. Pond or Native Fish: 1, P. Lewis (Bristol); 2, M. Bucher (Trowbridge); 3, N. Wood (Gloucester). Guppy (Male): 1, A. Heels (Bishops Cleeve); 2, P. Lewis (Bristol); 3, D. Egan (Port Talbot). Guppy (Female): 1, G. King (Stroud); 2 and 3, D. Richards (Rhondda). Molies: 1, R. Phippen; 2, N. Gray (Bristol); 3, P. Greenwood (Bishops Cleeve). Swordtails: 1, G. Lawrence (Bristol); 2, D. Richards (Rhondda); 3, C. Russell (Bath). Platies: 1 and 2, N. Gray (Bristol); 3, Mr. Higgs (Gloucester). Common Small Barbs: 1 and 2, C. Turner (Cardiff); 3, T. Collier (Gloucester). A.O.V. Barbs: 1, N. Gray (Bristol); 2, F. Rowell (Bath); 3, C. Whitaker (Stroud). Danios: 1, M. Bucher (Trowbridge); 2 and 3, J. Egan (Port Talbot). Minnows and Barbons: 1, J. Rowell (Bath); 2, D. Noble (Bristol); 3, R. Sullard (Rhondda). H.B. and Chetodons: 1, R. Day (Bristol); 2, F. Rowell (Bath); 3, D. Noble (Bristol). A.O.V. Characins: 1, J. Hoare (Rhondda); 2, Mr. and Mrs. Williams (Rhondda); 3, S. Thoen (Rhondda). Dwarf Cichlids: 1 and 2, R. Hoare (Rhondda); 3, C. Pratt (Bedworth). Angel Fish: 1, N. Gray (Bristol); 2, T. Hampshire (Bristol); 3, P. Greenwood (Bishops Cleeve). A.O.V. Cichlids: 1, D. Noble (Bristol); 2, R. Beard (Stroud); 3, J. Hawkins (Bishops Cleeve). Siamese Fighters: 1, C. Rositer (Gloucester); 2, F. Rowell (Bath); 3, C. Turner (Cardiff). A.O.V. Labyrinth: 1, F. Sutherland (Cardiff); 2, C. Turner (Cardiff); 3, D. Walsh (Bristol). Corydoras and Brochis: 1, Mr. and Mrs. M. Williams (Rhondda); 2, P. Lewis (Bristol); 3, R. Phippen. A.O.V. Catfish: 1, S. Green (Yate); 2, N. Gray (Bristol); 3, G. Lawrence (Bristol). Botia, Loaches, Sharks and Flying Fox: 1, C. Russell (Bath); 2, R. Hoare (Rhondda); 3, F. Buckingham (Cardiff). Egg-laying Toothcarps: 1 and 3, G. Churchill (Bristol); 2, D. Walsh (Bristol). A.O.V. Tropical: 1, R. Hoare (Rhondda); 2, Mr. and Mrs. M. Williams (Rhondda); 3, R. Day (Bristol). Sexed Pairs (Egg-layers): 1, D. Merret (Gloucester); 2, Mr. and Mrs. M. Williams (Rhondda); 3, R. Bennett (Yate). Sexed Pairs (Livebearers): 1, N. Gray (Bristol); 2, P. Greenwood (Bishops Cleeve); 3, K. Press (Bath). Teams of Four Livebearers: 1, C. Turner (Cardiff); 2, C. Harding (Cardiff); 3, P. Greenwood (Bishops Cleeve). Teams of Four Egg-layers: 1, C. Harding (Cardiff); 2 and 3, C. Turner (Cardiff). 7 lb. Furnished Sweet Jar: 1, R. Beard (Stroud); 2 and 3, F. Sutherland (Cardiff). A.V. Tropical Junie: 1 and 3, N. Gray (Bristol); 2, P. Harding (Cardiff). Entries totalled 526 which was a record number.

MEMBERS of the Grimsby and Cleethorpes A.S. were entertained, at their meeting on 9th August, with a talk given by Allan Robinson,

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of the Scunthorpe Society, on judging standards. Mr. Robinson then acted as a guest judge for the table show. The results of which were as follows: Angles: 1, K. Svendsen; 2, E. Kirk; 3, N. Prime. Loaches: 1, B. Palford; 2, T. Walker; 3, D. Keeton. Breeders Livebearers: 1, 2 and 3, B. Palford. Juniors: 1, S. Woodhouse; 2 and 3, G. Wilson. Fish of the Show: K. Svendsen.

At the meeting on 23rd August members put the talk on judging to good use by trying their hands at judging one of the classes in the table show. The prize for the result nearest to those given by the show judges was won by K. Svendsen.

Results of the evening's table show were: A.O.V. Livebearers: 1, 2 and 3, P. Atkinson. Small Barbs: 1, K. Svendsen; 2, D. Norton; 3, R. Jennings. Large Characins: 1 and 3, B. Palford; 2, A. Whitehead. Juniors: 1 and 2, D. Kirk; 3, P. Metcalfe. Fish of the Show for the second meeting running: K. Svendsen.

The East Kilbride Aquarium Club opened its first season in August with a talk and film side on Cichlids. The speaker and judge for the evening was W. Logan, who gave a most interesting and informative commentary on the slides. The results of the table show were: Senior Section, Dwarf Cichlids: 1, J. Syms; 2 and 3, J. Irving; 4, E. Brown. Large Cichlids: 1, A. Wilson; 2, T. Wilson; 3, J. Irving; 4, N. Grant. Junior Section, Dwarf Cichlids: 1, D. Watson; 2, N. Hall; 3, G. Bell; 4, H. Jones. Large Cichlids: 1 and 2, S. Thomson; 3, N. Murrigh; 4, K. McKenzie.

A new feature of the Club nights is the introduction of a "Best Fish in the Table Show" competition between the firsts in the Senior and Junior Sections for which the winner receives a medalion. The winner on this occasion was J. Syms.

THE results of the Grimsby and Cleethorpes A.S. first open show were as follows:

Livebearers, Guppies: 1 and 2, B. Kirk and Son (Grimsby); 3, G. Andrews (Hull). Livebearers, Platies: 1 and 3, E. Kirk and Son (Grimsby); 2, Mr. and Mrs. Stevenson (Sherwood). Livebearers, Swordtails: 1, G. Andrews (Hull); 2, Holmes and Whitehead (Grimsby); 3, E. Kirk and Son (Grimsby). Livebearers, Mollies: 1, Holmes and Whitehead (Grimsby) (only one entry). Livebearers, A.O.V.: 1, J. Whiteley (Aireborough); 2, Mr. and Mrs. Davison (Gainsborough); 3, Mr. and Mrs. Toyne (Sheffield). Characins (Small): 1 and 3, Mr. and Mrs. Popsen (Scunthorpe); 2, Mr. and Mrs. Blades (Gainsborough). Characins (Large): 1, J. Whiteley (Aireborough); 2, B. Palford (Grimsby); 3, F. Walker (Grimsby). Cichlids (Dwarf): 1 and 3, J. and H. Derrick (Dukeries); 2, W. Gilting (Gainsborough). Cichlids (Large): 1, J. Whiteley (Aireborough); 2, R. Jennings (Grimsby); 3, Mr. and Mrs. Stevenson (Sherwood). Cichlids, Angles: 1, Mr. and Mrs. Davison (Gainsborough); 2, Mr. and Mrs. Toyne (Sheffield); 3, E. Kirk and Son (Grimsby). Barbs (Small): 1, D. Norton (Grimsby); 2, K. Svendsen (Grimsby); 3, J. Whiteley (Aireborough). Barbs (Large): 1, R. Jennings (Grimsby); 2, B. Palford (Grimsby); 3, G. Silburn (Grimsby). Minnows, Danios: 1, M. Footitt (Alfreton); 2, Mr. and Mrs. Davison (Gainsborough); 3, J. Lill (Grimsby). Ramboras: 1, H. Kohn (Lincoln); 2, W. Gilting (Gainsborough); 3, J. Lill (Grimsby). Sharks: 1, G. Silburn (Grimsby); 2, H. Jewison (Thorne). 3, T. Sands (Boston). Foxes: 1, T. Sands (Boston) (only one entry). Anabantids, Siamese Fighters: 1, Mr. and Mrs. Toyne (Sheffield); 2 and 3, A. Mawson (Workop). Anabantids (Small): 1, E. Kirk and Son (Grimsby); 2 and 3, Holmes and Whitehead (Grimsby). Anabantids, A.O.V.: 1, Mr. and Mrs. Blades (Gainsborough); 2, J. and H. Derrick (Dukeries); 3, J. Husband (Boston). Breeders (Egglayers): 1, Mr. and Mrs. Shipman (Grantham); 2, K. Shaw (Gainsborough); 3, R. Hodgson (Thorne). Breeders (Livebearers): 1, G. Andrews (Hull); 2, Mr. and Mrs. Toyne (Sheffield); 3, Mr. and Mrs. Harris (Gainsborough). Pairs (Egglayers): 1, J. and H. Derrick (Dukeries); 2, B. Palford (Grimsby); 3, Mr. and Mrs. Shipman (Grantham). Pairs (Livebearers): 1, G. An-

draws (Hull); 2, Holmes and Whitehead (Grimsby); 3, Mr. and Mrs. Blades (Gainsborough). Catfish and Loaches (Corydoras Catfish): 1, Mr. and Mrs. Popsen (Scunthorpe); 2, J. Jones (Grantham); 3, Holmes and Whitehead (Grimsby). Catfish and Loaches, A.O.V.: 1, P. Taylor (Independent); 2, B. Palford (Grimsby); 3, T. Walker (Grimsby). Catfish and Loaches, Loaches: 1, Mr. and Mrs. Davison (Gainsborough); 2, S. Withers (Gainsborough); 3, Mr. and Mrs. Caldwell (Scunthorpe). Killies, Aphyssioids: 1, Mr. and Mrs. Blades (Gainsborough); 2, B. Palford (Grimsby). Killies, Rivulus: 1, Mr. and Mrs. Blades (Gainsborough); 2, T. Holmes (Grimsby). Killies, A.O.V.: 1, Mr. and Mrs. Blades (Gainsborough); 2, Mr. and Mrs. Harris (Gainsborough); 3, D. Hughes (Grimsby). A.O.V. Tropical (A.O.V. Egglayers): 1, Mr. and Mrs. Shipman (Grantham); 2, D. Wyrell (Grimsby); 3, Mr. and Mrs. Caldwell (Scunthorpe). A.O.V. Tropical, A.V. Marines: 1 and 2, A. Metcalfe (Grimsby); 3, Mr. and Mrs. Caldwell (Scunthorpe). Coldwater, Goldfish and Comets: 1 and 2, Mr. and Mrs. Toyne (Sheffield); 3, A. Metcalfe (Grimsby). Coldwater, Shubunkins: 1, E. Kirk and Son (Grimsby) (Only one entry). Coldwater, Fancy: 1, A. Metcalfe (Grimsby); 2 and 3, Mr. and Mrs. Toyne (Sheffield). Coldwater, A.O.V.: 1, J. Whiteley (Aireborough); 2, Mr. and Mrs. Blades (Gainsborough); 3, J. Toyne (Sheffield). The Best Angel Trophy, donated by Mr. and Mrs. Jennings of Humberston, was won by Mr. and Mrs. Davison of the Gainsborough Society. The visiting society gaining the most points and receiving the Best Society Trophy, donated by S. S. Fowler, Engineer and Ironfounder of Grimsby, was the Gainsborough Society with 30 points, second being the Crosswell Society with 27 points and third the Scunthorpe Society with 22 points. The Best Fish in Show Trophy donated by Mr. and Mrs. A. Watson, Florists of Humberston, was won by J. and H. Derrick of the Dukeries.

The inter-club match between Derby Regent A.S. and Alfreton A.S. was held in August. Members enjoyed a performance by a first-class magician, J. Keith (member of the Magic Circle). B. Inman judged the twelve classes arranged and the points total was Derby Regent 50 points, Alfreton 12 points. The return will be in November, at Alfreton.

The Privateers (Shipley, Yorks.) had an outing to Moorfield Aquatics on 12th July. However, when the party arrived apparently no one was there to look after them.

The Society visited Rombold's Water Board in August when Mr. Prince was their host, and this proved to be a very interesting evening's entertainment. The next meeting will be at Northcliffe Secondary School, Osley Road, Shipley, on 9th October, at 7.30 p.m.

READERS are requested to note that the Association of Yorkshire Aquarist Societies has now changed its policy and is now accepting Societies from outside the Yorkshire boundaries. Any society wishing to join please contact the Secretary, E. Stoker, 139 Bradford Avenue, Greenfield, Hull, Yorks. The Association has also changed its title which is now "Yorkshire & Associated Aquarist Societies."

A VERY interesting talk by Mr. L. Collins on breeding egg-laying tooth corps was given at the August meeting of the Stockton A.S. The table show results were as follows:—Livebearers (Pairs): 1 and 3, L. Osman; 2, A. Saunders. Egglayers (Pairs): 1 and 3, D. Keithly; 2, J. McGee; 4, B. Bowerman. Platies: 1, 2 and 3, K. Greenley. Cichlids (Large and Dwarf): 1, G. Lee; 2, J. Waller.

TWO meetings of the Goole and District A.S. were held in August, both of which were well attended. The first meeting consisted of a table show on Characins and a talk on Marine Tropicals illustrated by slides. Results of the table show are as follows:—1, R. Hill; 2, G. Pocharingham; 3, T. Brown. The second meeting consisted of a general talk on Tropical

Fish and Fish Photography. A member of the Hull A.S. visited us on this occasion, bringing with him a selection of slides taken in fish houses in the Hull area.

THE Kingston and District A.S., combined with S.P.A.S.S., held their annual show in August, and although the entry was down on last year the show as a whole was a great success. R. Hiley, of Basingstoke, won the Best Fish in the Show award and Roehampton collected the Kingston Shield for the Highest Pointed Club.

The judges in attendance were R. Wigg, E. Nicoll, J. Schwel, W. Gorwill, P. Tomkins, C. A. T. Brown, N. Wilson, W. Leach and R. Eason.

The results of the show were: Class Ad: 1, Mrs. Arrow (E. London). Class A: 1 and 2, D. Nutt (Totterham). Class B: 1, S. Mason (Roehampton); 2, J. Bellingham (Tonbridge); 3, B. Bisson (Basingstoke); 4, A. Lushy (Mid-Herts). Class C: 1 and 2, M. West (K.D.A.S.); 3, Isobell Bellingham (Tonbridge); 4, May Netherhall (Riverside). Class C: 1 and 2, A. Taw; 3, M. Strang (Basingstoke); 4, A. Taylor (Sudbury). Class D: 1, S. Barrs (Ealing); 2, M. Strang (Basingstoke); 3, L. Derrick (Croydon); 4, T. Bellingham (Tonbridge). Class Da: 1 and 3, May Netherhall (Riverside); 2, A. Stacey (Goport); 4, E. Lefevre (K.D.A.S.). Class Db: 1 and 2, F. Willis (Portsmouth); 3, S. Mason (Roehampton); 4, M. Platt (Hounslow). Class E: 1, D. Lambourne (Roehampton); 2, M. West (K.D.A.S.); 3, Carol Sawford (K.D.A.S.); 4, G. Bower (Sherwood). Class Ea: 1, E. Freemantle (Goport); 2, Jean Price (K.D.A.S.); 3, K. Rees (Goport); 4, A. Taylor (Sudbury). Class F: 1, Mrs. J. Gerrard (Runnymede); 2, D. Ellis (K.D.A.S.); 3, M. Walker; 4, J. Bellingham. Class G: 1, 3 and 4, D. Lambourne (Roehampton); 2, R. Goodson (Roehampton). Class H: 1 and 4, May Netherhall (Riverside); 2, S. Mason (Roehampton); 3, T. Cruikshank (Ealing). Class I: 1, S. Mason (Roehampton); 2, D. Armour (Riverside); 3, J. Butt (Ealing); 4, R. Hiley (Basingstoke). Class K: 1, J. King (Ealing); 2, May Netherhall (Riverside); 3, L. Derrick (Croydon); 4, Mrs. S. Parrish (Hounslow). Class L: 1, May Netherhall (Riverside); 2, B. Bisson (Basingstoke); 3, D. Armour (Riverside); 4, A. Lushy (Mid-Herts). Class M, A.O.S. Tropical Egg-layer: 1, R. Hiley (Basingstoke); 2, D. Lambourne (Roehampton); 3, R. Goodson (Roehampton); 4, K. Rees (Goport). Class N, B.M.A.V. Pairs (Egg-layer): 1, J. Barrs (Ealing); 2, B. Bisson; 3, Mrs. J. Gerrard (Runnymede); 4, A. Walker (B.K.A.). Class N, O.T.A.V. Pairs (Livebearers): 1, S. Mason (Roehampton); 2, May Netherhall (Riverside); 3, R. Hiley (Basingstoke); 4, A. Lushy (Mid-Herts). Class O, A.V. Guppy (Male): 1, M. Netherhall (Riverside); 2, 3 and 4, T. Cruikshank (Ealing). Class P, A.V. Guppy (Female): 1 and 3, Mrs. J. Gerrard (Runnymede); 2, P. Yerfell (Roehampton); 4, A. Taylor (Sudbury). Class Q, Swordtail: 1, A. Taylor (Sudbury); 2, T. Cruikshank (Ealing); 3, S. Mason (Roehampton); 4, G. Marlow (Clapham). Class R, A.V. Platy: 1, J. Barrs (Ealing); 2, S. Mason (Roehampton); 3, D. Cruikshank (Ealing); 4, N. Aldridge (Hounslow). Class S, A.V. Molly: 1, M. Netherhall (Riverside); 2, K. Smith (Runnymede); 3 and 4, J. Igoe (Sherwood). Class T, A.O.S. Tropical Livebearer: 1, J. Bannion (Hounslow); 2, Miss Thompson (Runnymede); 3, K. West (K.D.A.S.); 4, M. Bourne (Basingstoke). Class U, A. Common Goldfish: 1, R. Whittington (G.S.G.B.); 2, R. Dudley (S.P.A.S.S.); 3, Mr. Linole (E. London); 4, P. Berrard (S.P.A.S.S.). Class U, B. London Shubunkin: 1, R. Dudley (S.P.A.S.S.); 2, R. Whittington

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(G.S.G.B.); 3, Mr. Linné (B. London); 4, S. Hedges (Bethnal Green). Class Un. G.S.G.B. Singletail Bristol Shubunkin: 1, 2 and 4, D. Morris (S.G.S.B.); 3, R. Whittington (G.S.G.B.). Class Ld. Corner: 1, V. Hunt (Havant). Class Vg. Veiltail: 1 and 2, Mr. Linné (B. London); 3, D. Nutt (Tottenham); 4, T. Longstaff (K.D.A.S.). Class Vb. Fantail: 1, Mr. Linné (B. London); 2, V. Hunt (Havant); 3, P. Pinder (Havant). Class Vg. Globe-eye: 1, M. Dudley (S.P.A.S.S.). Class Vd. Broadtail Moor: 1 and 2, M. Dudley (S.P.A.S.S.). Class Vt. Oranda: 1 and 2, P. Glynn (S.P.A.S.S.); 3 and 4, C. Long (S.A.P.S.). Class Vg. Pearlscale: 1, 2 and 3, M. Dudley (S.P.A.S.S.). Class Vt. Lionhead: 1, 3 and 4, T. Thornton (S.P.A.S.S.); 2, P. Glenn (S.P.A.S.S.). Class Vt. 1, J. Sisk (S.P.A.S.S.). Class W. A.O.S. Native and Foreign Gold-winner: 1, 2 and 3, V. Hunt (Havant); 4, R. Dudley (S.P.A.S.S.). Class Wa. Hi-Gol-Koi: 1, S. Hedges (Bethnal Green); 2, R. Dudley (S.P.A.S.S.); 3, R. Rich (Basingstoke); 4, L. Menhennett (New Forest). Class Wb. Centric-chide: 1, Mr. Binstead (Portsmouth); 2, S. Hedges (Bethnal Green); 3, R. Dudley (S.P.A.S.S.); 4, R. Whittington (G.S.G.B.). Class X. B.M. Tropical Egg-layer (Breeders): 1, P. Willis (Portsmouth); 2, Mrs. P. Lambourne (Rochampton); 3, D. Lambourne (Rochampton); 4, G. Pesson (B. London). Class X. O.T. Tropical Livebearer (Breeders): 1, B. Bisson (Basingstoke); 2, J. Thompson (Rushey-mede). Class X. UV Goldfish (Breeder): 1, D. Morris (G.S.G.B.); 2, Mr. Linné (B. London); 3, P. Whittington (G.S.G.B.); 4, Mr. Linné (B. London). Class X. W.A.O.S. Native and Foreign Breeders: 1, R. Whittington (G.S.G.B.). Class Za. A.V. Rooted Plant: 1, P. Whittington (G.S.G.B.); 2, T. Hughes (Rochampton); 3, Mr. Arrow; 4, M. Dudley (S.P.A.S.S.). Class Zb. Cuttings: 1, J. Hughes (Rochampton); 2, Mrs. Arrow (B. London); 3 and 4, J. Hughes (Rochampton). Class Zc. C.A.V. Floating Plant: 1 and 2, R. Pellard (K.D.A.S.); 3, Mrs. Arrow (E. London).

AN inter-club quiz was the highlight of the September meeting of the **Chelmsford A.S. Members of the Dunmow A.S.** gave C.A.S. good opposition by winning the crossword quiz which was conducted by J. Henderson in the first half of the evening. The second half of the evening was another quiz conducted by D. Perry, vice-chairman, Dunmow Club. Winners being Dunmow once again.

The table show which was A.O.V. attracted 47 entries, 19 for Dunmow, 28 for Chelmsford, which were judged by D. Bird, Chelmsford and M. Seago, Dunmow. Winners were: 1, G. Sutton (Chelmsford); 2, R. Thoday (Dunmow); 3, R. Knight (Chelmsford). The raffle prize of one year's subscription to the *Aquarist* was won by K. Andrews of Dunmow. A vote of thanks was given by D. Perry, vice-chairman of Dunmow.

ON Sunday, 14th January, 1973, the **Derby Regent A.S.** will be holding a Grand Aquarist Seminar, an extravaganza of lectures and films all day at the Playhouse Theatre, Derby. There will be talks by Dr. Carrington, Graham Cox and Roy Skipper and the master of ceremonies will be Ron Tensch. It is hoped to provoke questions and discussion among all those present, and so gain maximum benefit for all.

In order to promote the show it will be necessary to sell 200 tickets, that is at least five to forty societies. Full details will be sent to club secretaries or show secretaries. Tickets will be 40p, and to encourage early booking, a special discount will be given to parties that

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book before 18th November. Write to above address or 'phone Derby 841235.

RESULTS of the Bedworth A. and P.S. open show were as follows: A.V. Guppy: 1, Miss S. Hartwell (Hinckley); 2 and 3, T. Cruickshank (Ealing); 4, Mr. and Mrs. Jeffs (Nuneaton). A.V. Molly: 1 and 3, G. & S. (Northampton); 2, R. Bowes (Ind.); 4, J. Igoe (Sherwood). A.O.V. Livebearer: 1, Mrs. D. Cruickshank (Ealing); 2 and 3, D. White (Bedworth); 4, R. Shakespeare (Bedworth). Characins: 1, K. Pratt (Bedworth); 2, K. Brooks (M.T.A.); 3, T. Saunders (G.K.N.); 4, R. Bowes (Ind.). A.O.V. Characins: 1, Mr. and Mrs. Downing (Sherwood); 2, Mrs. M. Roberts (Ind.); 3, B. and P. Hirst (Coventry); 4, G. Cox (Chelmsley). Barbs: 1 and 3, K. Brooks (M.T.A.); 2, T. Davis (M.T.A.); 4, D. Tait (Goodyers End). A.O.V. Barbs: 1, Miss S. Hartwell (Hinckley); 2, Master A. Simmons (Coventry); 3, Mrs. D. Cruickshank (Ealing); 4, D. White (Bedworth). Cichlids: 1 and 2, J. Goodman (Wombourne); 3, E. Cobill (M.T.A.); 4, R. North (Pelshall). A.O.V. Cichlid: 1, A. Kinsey (Ind.); 2, R. Todd (Bedworth); 3, B. Snell (Yate); 4, R. Hough (M.T.A.). Angel Fish: 1, Mr. and Mrs. Gillett (Nuneaton); 2, Mr. and Mrs. Jeffs (Nuneaton); 3, Mrs. G. Beard (Spa); 4, K. Bates (Hinckley). Siamese Fighter: 1, R. Bowes (Ind.); 2, G. & S. (Northampton); 3, Miss S. Hartwell (Hinckley); 4, C. Pratt (Bedworth). A.O.V. Anabantids: 1, G. Taylor; 2, K. Brooks (M.T.A.); 3, C. Kirkham (Tamworth); 4, T. Hampshire (Bristol). Corydoras and Bruchis Catfish: 1, R. Bowes (Ind.); 2, T. Cruickshank (Ealing); 3, M. Bates (Haden Select); 4, Mrs. M. Roberts (Ind.). A.O.V. Catfish: 1, Mr. and Mrs. E. Bird (Spa); 2, J. Mayle (Chelmsley); 3, Master D. Beard (Spa); 4, J. Houseley (Bedworth). A.V. Loach: 1, D. White (Bedworth); 2, Mrs. P. Hinde (Coventry); 3, Mrs. V. Hough (M.T.A.); 4, G. & S. (Northampton). Killies: 1, B. & F. Hirst (Coventry); 2, A. Clarke (Hinckley); 3, P. Underwood (Spa); 4, Mrs. S. Fowler (North Works). Rasboras: 1 and 2, Mrs. M. Roberts (Ind.); 3, Mrs. W. Bradley (Nuneaton); 4, K. Brooks (M.T.A.). Danios W.C.M.M.: 1, E. Williams (Chelmsley); 2 and 3, J. Goodman (Wombourne); 4, R. Bowes (Ind.). Egg-layers (Pairs): 1 and 2, R. Hough (M.T.A.); 3, T. Parry (Loughborough); 4, Mr. and Mrs. Noble (Chelmsley). Livebearers (Pairs): 1, R. North (Pelshall); 2, R. Hough (M.T.A.); 3, D. White (Bedworth); 4, R. Hancock (Spa). Breeders (Egg-layers): 1, 3 and 4, R. North (Pelshall); 2, Mr. and Mrs. Bird (Spa). Breeders (Livebearers): 1, B. & F. Hirst (Coventry); 2, A. Troth (Atherstone); 3, J. Mayle (Chelmsley); 4, D. White (Bedworth). A.O.V. Tropical: 1, C. Kirkham (Tamworth); 2, Mrs. V. Hough (M.T.A.); 3, M. Bates (Hinckley); 4, D. Noble (Bristol). Pedigree Single-tailed Goldfish: 1, F. Wain (Coventry); 2 and 4, D. Easingwood (Coventry); 3, R. Scally (Bedworth). Pedigree Twin-tailed Goldfish: 1, Mr. and Mrs. J. Belcombe (Bedworth); 2, Mrs. V. Hough (M.T.A.); 3, Mr. and Mrs. Jeffs (Nuneaton). A.V. Goldfish other than Pedigree: 1, R. Shakespeare (Bedworth); 2, J. Goodman (Wombourne). A.V. Coldwater Pond or River Fish: 1, Mrs. V. Hough (M.T.A.); 2, Mr. Shilton-Mayer; 3, D. White (Bedworth); 4, P. Wain.

THERE were 462 entries, including two from Ontario, Canada, at the **Valley A.S. Open Show**. Results as follow: Guppies: 1, L. Leadbetter (Blackpool); 2, I. Rowbottom (Hyde); 3, Mr. and Mrs. Haydon (Hyde). Mollies: 1 and 3, J. S. Hall (Aireborough), section winner; 2, L. Leadbetter (Blackpool). Swordtails: 1, G. Newbold (Welbeck); 2, C. Beckenham (Oldham); 3, G. Thickbroom (Welbeck). Platies: 1 and 3, P. Ibbrell (Hyde); 2, B. Black (Blackpool). A.O.V. Livebearer: 1, L. Leadbetter (Blackpool); 2 and 3, J. S. Hall (Aireborough). Barbs (up to Roy): 1, L. Leadbetter (Blackpool). Barbs (Large): 1, I. Rowbottom; 2, M. Goodchild (Valley); 3, C. Beckenham (Oldham). Characins (Small): 1, F. E. Gregory; 2, Mr. and Mrs. Gates (Castleford); 3, I. Rowbottom (Hyde). Characins (Large): 1, Mrs. Standen (Loyne), section winner; 2, P. and H. Batchelor

(Loyne); 3, J. Rowbottom (Hyde). Angels: 1, I. Rowbottom (Hyde); 2, Miss A. Gregory (Nelson); 3, E. Smith (Sheffield). Dwarf Cichlids: 1, R. Dyson (Blackpool); 2, Mr. and Mrs. Gates (Castleford); 3, G. Thickbroom (Welbeck). Large Cichlids: 1, Mrs. Booker (Morecombe Bay), section winner; 2, Mr. and Mrs. Gates (Castleford); 3, I. Rowbottom (Hyde). Anabantids (Fighters): 1, S. A. Holland (B.K.A.), section winner; 2, E. McQuade (Ontario, Canada); 3, J. S. Hall (Aireborough). Anabantids Dwarf: 1, J. Dickinson (Castleford); 2, E. Smith (Sheffield); 3, Mrs. Lord (Valley). Anabantids Large: 1, I. Rowbottom (Hyde); 2, J. S. Hall (Aireborough); 3, Mrs. Standen (Loyne). Sharks: 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, J. S. Hall (Aireborough); 3, B. Booker (Morecombe Bay). Flying Poles: 1, G. Thickbroom (Welbeck); 2, Mr. and Mrs. Fletcher (Private entry); 3, Mr. and Mrs. Gates (Castleford). Louches and Eels: 1, Mr. and Mrs. Norris (Loyne), section winner; 2, P. and H. Batchelor (Loyne); 3, J. S. Hall (Aireborough). Danios and Minnows: 1, F. E. Gregory; 2, Mr. and Mrs. Haydon; 3, M. Timmering (Hyde). Rasboras: 1 and 2, P. and H. Batchelor (Loyne); 3, Mr. and Mrs. J. Dickinson (Castleford). Toothcarps: 1, H. Baldwin (F.G.A.), section winner; 2, T. Smith (Sheffield); 3, Thorne and O'Brien (B.K.A.). Corydoras: 1 and 2, P. and H. Batchelor (Loyne); 3, L. P. Graham (Loyne). A.O.V. Catfish: 1, D. Greenwood (Nelson), section winner; 2, Mr. and Mrs. Gates (Castleford); 3, P. and H. Batchelor (Loyne). Pairs (Egg-layers): 1, F. E. Gregory, section winner; 2, D. Buxton (Hyde); 3, R. Dyson. Pairs (Livebearers): 1, G. Newbold (Welbeck); 2 and 3, L. Leadbetter (Blackpool). A.O.V. Tropical: 1, G. Thickbroom (Welbeck), Best in Show; 2, Mrs. Norris; 3, Mr. and Mrs. Norris, Breeders (Egg-layers); 1, R. Dyson, section winner; 2, M. B. Parclough (Bolton); 3, J. T. Linney (Hyde). Breeders (Livebearers): 1, Mr. and Mrs. Gates (Castleford); 2, L. Leadbetter (Blackpool); 3, J. S. Hall (Aireborough). Cold-water Fancy: 1, J. S. Hall (Aireborough), section winner; 2, C. H. Whitney (Accrington); 3, Walsh (Accrington). Native and Common: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Coldwater: 1, 2 and 3, S. Walsh (Accrington). Juniors (Egg-layers): 1, W. L. Booker (Morecombe Bay), section winner; 2, M. Thickbroom (Welbeck); 3, B. Black (Blackpool). Juniors (Livebearers): 1, K. Newbold (Welbeck); 2 and 3, Susan Clarke (Barnsley). Valley only (A.V. Livebearers): 1, M. Goodchild; 2 and 3, Mr. and Mrs. Roberts, Valley only (A.V. Egg-layers); 1, Mrs. A. Hough; 2, Mrs. Lord; 3, Mr. and Mrs. Roberts, Valley Juniors: 1 and 3, M. Chapman; 2, Karen Chapman.

WINNER of the Table Show for Rasboras, Danios and Minnows at the Bishops Cleeve A.S. August meeting was A. Heels who took the first four places. Messrs W. Holland, M. Littleton, R. Parsons and M. McClellan were guests and answered questions on Show Judging and how three-day shows are run, which proved interesting and helpful to the members. Next year's Open Show secretary will be Mrs. J. Hawkins, 44 Burton Street, Cheltenham, Glos., and the Club will also have a show manager in P. J. Greenwood, 10 Russell Place, Cheltenham, Glos.

SHOW results of the Oldham and District A.S. open were as follows: Guppies: 1, G. Thickbroom (Welbeck); 2, Mr. and Mrs. Cobb (Belle Vue); 3, A. Moss (Huddersfield). Mollies: 1, G. Thickbroom (Welbeck); 2, Anthony Atherton (Greenwood); 3, R. Dyson (Blackpool). Swordtails: 1, A. Jones (Welbeck); 2, Susan Clarke (Barnsley); 3, C. Beckenham (Oldham). Platies: 1, Clarke Bros. (N. Staffs.); 2, Susan Clarke (Barnsley); 3, M. Harris (Castleford). Anabantids: 1, Michelle Jones (Valley); 2, Mr. and Mrs. Gates (Castleford); 3, Mr. and Mrs. Cohen (Castleford). Fighters: 1, Mr. and Mrs. Toyne (Sheffield); 2, S. Holland (B.K.A.); 3, Ian Bewick (Oldham). Small Barbs: 1, 2 and 3, F. E. Gregory (Oldham). Large Barbs: 1, T. Smith (Sheffield); 2, M. Jones (Valley); 3, Mr. and Mrs. Cohen (Castleford). Small Cichlids: 1, R. Dyson (Blackpool); 2, B. Stevens (Castle-

ford); 3, S. Hooton (Sandgrounders), Large Cichlids: 1, Mrs. B. Booker (Morecambe Bay); 2, J. Rowbottom (Hyde); 3, Master F. Cobb (Belle Vue), Angels: 1, J. Rowbottom (Hyde); 2, J. Healey (Hyde); 3, Mr. and Mrs. E. Smith (Sheffield). Small Characins: 1, Mr. and Mrs. Gates (Castleford); 2, Mr. and Mrs. Cobb (Belle Vue); 3, J. Rowbottom (Hyde). Medium Characins: 1, Mrs. B. Booker (Morecambe Bay); 2, P. and H. Batchelor (Loyne); 3, Mr. and Mrs. Norris (Loyne). Large Characins: 1, J. A. Whiteley (Aireborough); 2, Clarke Bros. (N. Staffs.); 3, P. Mulley (Independent). Rasboras: 1, H. Jackson (Kerley); 2, J. A. Whiteley (Aireborough); 3, E. Greenwood (Nelson). Danios and Minnows: 1, F. E. Gregory (Oldham); 2, A. Moss (Huddersfield); 3, Mr. and Mrs. H. Smith (Sheffield). Sharks: 1, G. Thickbroom (Welbeck); 2, H. Lees (Oldham); 3, E. Seymour (Merseside). Foxes: 1, G. Thickbroom (Welbeck); 2, Mr. and Mrs. Gates (Castleford); 3, P. and H. Batchelor (Loyne). Toothcarps: 1, H. Baldwin (P.G.A.); 2, B. Forrester (B.K.A.); 3, E. Birchwood (Oldham). Corydoras: 1, K. Brunt (Staffs.); 2, Mr. and Mrs. Norris (Loyne); 3, Mr. and Mrs. Cobb (Belle Vue). A.O.V. Catfish: 1, P. and A. Batchelor (Loyne); 2, Mr. and Mrs. Gates (Castleford); 3, A. Devine (Independent). Loaches: 1, F. E. Gregory (Oldham); 2, R. Walker (Morecambe Bay); 3, P. Stratford (Valley). Breeders Egglayers: 1 and 2, R. Dyson (Blackpool); 3, Mr. and Mrs. Cohen (Castleford). Breeders Livebearers: 1, A. Moss (Huddersfield); 2, G. Thickbroom (Welbeck); 3, Mr. and Mrs. Gates (Castleford). Pairs Egglayers: 1, P. E. Gregory (Oldham); 2, K. Stafford (Oldham); 3, P. Whelan (Blackburn). Pairs Livebearers: 1, J. A. Whiteley (Aireborough); 2, Mrs. S. Newbold (Welbeck); 3, A. Jones (Welbeck). Fancy Goldfish: 1, G. H. Accrington. Common Goldfish: 1, C. H. Whiteley (Accrington); 2 and 3, Mr. and Mrs. Toyne (Sheffield). A.O.V. Goldwater: 1, 2 and 3, S. Walsh (Accrington). A.O.V. Tropical: 1, P. and H. Batchelor (Loyne); 2, G. Thickbroom (Welbeck); 3, K. Brunt (Staffs.). Mini-Furnished Jars: 1 and 3, E. Birchwood (Oldham); 2, A. Moss (Huddersfield). Plants: 1, A. Milfin (Staffs.); 2 and 3, J. Toyne (Oldham). Best Fish in Show was won by Mrs. B. Booker from Morecambe Bay.

SLIDES of "An Introduction to Cichlids" and "Marines" were shown to a good gathering at the August meeting of **Keighley A.S.** The monthly Table Show results were as follows: Fish of the Month (Barbs and Goldwater): 1, Mr. Hart; 2, Master Beckett; 3, Mrs. Heap. A.O.V.: 1, J. Mosley; 2, D. Mosley; 3, Mrs. Gear. Novice A.O.V.: 1, D. Mosley; 2, Mr. Ibbotson; 3, Mr. Hart. Junior A.V.: 1, Master Beckett; 2, Master Jones; 3, Master Bardgett.

RECENTLY the **Bournemouth A.S.** were hosts to the **New Forest A.S.** and the **Salisbury and District A.S.** for the first round of an Inter-club quiz and Table Show. Nearly 60 members were present and N. Walker gave a talk on cultivating live foods. T. Hatton, of Weymouth, judged the competition, and the result was an overall win for the **New Forest A.S.** with 545 pts.; **Salisbury and District A.S.** being second with 245 pts.; and **Bournemouth A.S.** third with 166 pts. The individual results were: Dwarf Cichlids: 1, 3 and 4, **New Forest**; 2, **Salisbury**. Danio, Rasboras and Minnows: 1 and 2, **Bournemouth**; 3 and 4, **Salisbury**. Shubunkins: 1, 2, 3 and 4, **New Forest**. After the interval the **New Forest A.S.** and the **Salisbury and District A.S.** took part in a quiz competition, the result being a win for **Salisbury**. The quizmaster was **Ron Matley**, who also compiled the quiz.

RESULTS of the **Liantwit Major A.S.** Open Show were as follows: Class Ad: 1, S. Nelson; 2, R. Wigg. Class B: 1, C. Turner; 2, S. Nelson; 3, W. Limbrick; 4, J. Egan. Class C: 1, M. Williams; 2, G. Scudamore; 3, J. Cilla; 4, B. Rice. Class Ca: 1, J. Daws; 2, P. Glover; 3 and 4, W. Limbrick. Class D: 1, P. Player; 2, T. Pans; 3, J. Daws; 4, W. Gorewell. Class Da: 1, J. Edwards; 2 and 4, W. Limbrick; 3, W. G. Best. Class Db: 1 and 2, C. Turner;

3, J. Thomson; 4, D. Richards. Class E: 1 and 4, C. Pick; 2, G. Sutherland; 3, P. Russell. Class Ea: 1, S. Nelson; 2, C. Turner; 3, W. Limbrick; 4, W. Burton. Class F: 1, P. A. Lewis; 2 and 3, C. J. Pick; 4, P. Glover. Class G: 1, C. Harding; 2, W. Limbrick; 3, S. Nelson; 4, W. Gorewell. Class H: 1, P. A. Lewis; 2, M. Williams; 3, C. Harding; 4, M. Fouracre. Class Ia: 1, K. Williams; 2, W. B. Rice; 3, C. Gardner. Class Ib: 1, K. Williams; 2, D. Player. Class J: 1, C. Harding; 2, W. Short; 3, C. Pittock; 4, M. Williams. Class K: 1, J. Edwards; 2, G. Pick; 3, W. Burton; 4, J. Egan. Class L: 1, P. Glover; 2 and 3, P. A. Lewis; 4, C. Turner. Class M: 1, P. A. Player; 2, S. Nelson; 3, P. Glover; 4, W. Gorewell. Class N: 1, S. Scudamore; 2, W. Short; 3, M. Williams; 4, W. Gorewell. Class O: 1, P. A. Lewis; 2, 3 and 4, W. Burton. Class Oa: 1, R. Wigg; 2, P. Jenkins. Class P: 1, T. Thomas; 2, P. A. Player; 3, C. Harding; 4, P. Glover. Class Q: 1, 3 and 4, R. Perkins; 2, S. Nelson. Class R: 1, P. A. Player; 2, P. A. Lewis; 3 and 4, W. Short. Class S: 1, S. Nelson; 2, D. Egan; 3, J. Egan; 4, J. Thomson. Class Xa: 1, W. G. Best; 2, C. Harding; 3, C. Turner; 4, J. Daws. Class Xb: 1 and 2, R. Perkins; 3, S. Nelson; 4, R. Wigg. Class Ya: 1 and 3, B. Harding; 2, C. Harding; 4, C. Rupert. Class Yc: 1 and 4, B. Harding; 2 and 3, C. Rupert. Class W: 1, B. Harding; 2 and 3, C. Rupert. Best Fish in Show: P. Player. Best Liantwit Fish in Show: J. Edwards.

FISH benched at the **Alfreton and District A.S.** Open Show totalled 580, from 33 societies. Results: Guppies (Males): 1 and 3, M. Laycock (Sheffield); 2, J. Jones (Grantham). Guppies (Females): 1, M. Laycock (Sheffield); 2, G. & S. (Northampton); 3, R. Holmes (Derby Regent). Platies: 1, Mr. and Mrs. Daines (Doncaster); 2, T. Sheppard (Doncaster); 3, J. Breailey (Belle Vue). Swordtails: 1, M. Allopp (Somerset), section winner; 2, F. Cooke (Huddersfield); 3, Mrs. Y. Rhodes (Four Star). Mollies: 1, P. Mighalls (Hucknall and Bulwell); 2, R. P. Baker (Welbeck); 3, J. Igoe (Sherwood). A.O.V.: 1, E. Smith (Sheffield); 2, Mr. and Mrs. Davison (Gainsboro); 3, Mr. and Mrs. Toyne (Sheffield). Barbs (Small): 1, Mrs. Y. Rhodes (Four Star); 2, M. Clarke (North Staffs.); 3, Mrs. B. Cohen. Barbs (Large): 1, R. Clarke (Sherwood), section winner; 2, Mrs. Stone (Chesterfield); 3, Mrs. B. Cohen (Castleford). Characins (Small): 1, Mrs. J. Lindley (Alfreton), section winner; 2, Mr. and Mrs. P. Harris (Gainsboro); 3, J. Wright (Alfreton). Characins (Large): 1, R. Shakespeare (Bedworth); 2, R. Middleton (Gainsboro); 3, Mr. and Mrs. Downing (Sherwood). Killifish: 1, P. Harrison (Sherwood), section winner; 2, T. Smith (Sheffield); 3, G. Thickbroom (Welbeck). Minnows: 1, D. Barnett (Leicester); 2, Mr. and Mrs. D. Stone (Chesterfield); 3, R. Clarke (Sherwood). Sharks and Foxes: 1, J. A. Clayton (Lucas), section winner; 2, G. Thickbroom (Welbeck); 3, T. Smith (Sheffield). Rasboras: 1, Mr. and Mrs. Downing (Sherwood); 2, J. S. Booth (North Staffs.); 3, Mr. and Mrs. Daines (Doncaster). Cichlids (Dwarf): 1, Mrs. Foster (Cresswell); 2, Mrs. H. Blades (Cresswell); 3, Mrs. D. Robertson (Derby Regent). Cichlids (Large): 1, Mrs. Gullane (Buxton); 2, D. A. Freeman (Leicester); 3, Mrs. H. Blades (Cresswell). Angels: 1, Mr. and Mrs. Davison (Gainsboro), section winner; 2, Miss A. Hill; 3, Mrs. J. Lindley (Alfreton). Corydoras: 1, M. Buxton (Sheffield), section winner; 2 and 3, Mr. and Mrs. Downing (Sherwood). A.O.V. Catfish: 1, J. S. Booth (North Staffs.); 2, Miss M. Lindley (Alfreton); 3, Mr. and Mrs. Bull (Derby Regent). Loaches: 1, P. Mighalls (Hucknall and Bulwell); 2, Mr. and Mrs. Davison (Gainsboro); 3, G. & S. (Northampton). Siamese Fighters: 1, Mr. and Mrs. Toyne (Sheffield); 2, J. S. Booth (North Staffs.); 3, Mr. and Mrs. Clarke (Barnsley). A.O.V. Anabantids: 1, Mrs. Cohen (Castleford), section winner; 2, K. Allen (Workshop); 3, Mrs. Y. Rhodes (Four Star). Tropical Freshwater: 1, R. Harlow (Derby Regent), section winner; 2, G. Thickbroom (Welbeck); 3, K. Dove (Pelshall). Tropical Marine: 1, Mrs. M. Igoe (Sherwood); 2, I. Igoe (Sherwood); 3, Mrs. Swarwick (Hucknall and Bulwell). Pairs, Egglayers: 1, Miss A. Gregory (Nelson), section

winner; 2, Mrs. H. Blades (Cresswell); 3, P. Spittlehouse (Workshop). Section UB: 1, Mr. and Mrs. C. J. Shipman (Grantham); 2, B. J. Rogers (Cresswell); 3, G. & S. (Northampton). Junior Egglayers: 1 and 2, M. Clarke (North Staffs.); 3, Miss S. Clarke (Sherwood). Junior Livebearers: 1, A. Dean (Alfreton); 2, Miss S. Clarke (Sherwood); 3, W. Dickinson (Castleford). Goldfish and Comets: 1, J. S. Hall (Aireborough); 2, J. Breailey (Belle Vue); 3, R. J. Rogers (Cresswell). Shubunkins: 1 and 2, J. S. Hall (Aireborough); 3, G. & S. (Northampton). Fancy Goldfish: 1 and 3, J. S. Hall (Aireborough); 2, Mr. and Mrs. Toyne (Sheffield). A.O.V. Goldwater: 1 and 3, J. S. Hall (Belle Vue), section winner; 2, J. Breailey (Aireborough). Breeders (Egglayers): 1, A. Thomas (Lucas), section winner; 2, Mrs. Cohen (Castleford); 3, Mr. and Mrs. Tomlinson (Chesterfield). Breeders (Livebearers): 1, Mr. and Mrs. Daines (Doncaster); 2, P. Harrison (Sherwood); 3, Mrs. Tomlinson (Chesterfield). Breeders (Goldwater): 1, J. S. Hall (Aireborough), Novice: 1, Mrs. P. Clarke (Sherwood); 2, W. Clarke (North Staffs.); 3, J. Wagstaff (Alfreton). Furnished Aquarium: 1, J. Breailey (Belle Vue). Mini Jars: 1, R. Holmes (Derby Regent); 2, Mr. and Mrs. J. Gabe (Chesterfield); 3, Mr. and Mrs. Jowle (Derby Regent). Plants (Aquatic): 1, Mrs. S. Breailey (Belle Vue), section winner; 2, J. Wright (Alfreton); 3, P. Spittlehouse (Workshop).

FIRST Open Show results from **Kraft A.S.** Section A—Livebearers: 1 and 3, M. Laycock (Sheffield); 2, J. S. Booth (N. Staffs.). Swordtails: 1, Mr. and Mrs. Cobb (Belle Vue); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. Haydon (Hyde). Platys: 1, D. Truby (Nelson); 2, Mr. and Mrs. Roberts (Valley); 3, Mr. and Mrs. Haydon (Hyde). Mollies: 1 and 2, D. Stevens (Castleford); 3, Mr. Atherton (Grimwood). Section B—Barbs (Small): 1, Mr. and Mrs. Blades (Cresswell); 2, C. Beckenham (Oldham); 3, Mr. and Mrs. Cobb (Belle Vue). Barbs (Large): 1, T. Smith (Sheffield). Section C—Characins (Small): 1, Mr. and Mrs. Roberts (Valley); 2, R. Holmes (Derby); 3, A. Milfin (N. Staffs.). Characins (Large): 1, L. Ankers (N. Staffs.); 2, Mr. and Mrs. Batchelor (Loyne); 3, D. Greenwood (Nelson). Section D—Anabantids (Small): 1, J. Gullane (Buxton); 2 and 3, Mr. Buxton (Hyde). Anabantids (Large): 1, Mr. and Mrs. Blade (Cresswell); 2, Mr. Atherton (Grimwood); 3, J. Rowbottom (Hyde). Fighters: 1 and 2, Mr. and Mrs. Toyne (Sheffield); 3, P. Dawson (Middleton). Section E—Cichlids (Dwarf): 1, Mr. and Mrs. Blades (Cresswell); 2, J. Gullane (Buxton); 3, K. Ankers (N. Staffs.). A.O.V. Cichlid: 1, J. Rowbottom (Hyde); 2, F. Cobb (Belle Vue); 3, Mr. Atherton (Grimwood). Angels: 1, Mr. and Mrs. Toyne (Sheffield); 2, Mr. and Mrs. Blades (Cresswell); 3, H. Marshallena (Oldham). Section F—A.V. Killifish: 1, Colecliff (Geeton and Openshaw); 2, T. Smith (Sheffield); 3, Mr. and Mrs. Blades (Cresswell). Section G—Catfish and Loaches: Corydoras: 1, Mr. and Mrs. Batchelor (Loyne); 2, K. Ankers (N. Staffs.); 3, T. Smith (Sheffield). A.O.V. Catfish: 1, Mr. Buxton (Hyde); 2, Mr. and Mrs. Batchelor (Loyne); 3, D. Greenwood (Nelson). Loaches: 1, T. Smith (Sheffield); 2, A. Taylor (Kraft); 3, Mr. Holden (Loyne). Section H—Sharks, Labors and Flying Foxes: 1, T. Smith (Sheffield); 2, D. Truby (Nelson); 3, R. Harlow (Derby Regent). Danios, Rasboras and White Cludys: 1, D. Greenwood (Nelson); 2, J. Gullane (Buxton); 3, Mr. and Mrs. Haydon (Hyde). A.O.V. Tropical: 1, K. Ankers (N. Staffs.); 2, Mr. and Mrs. Haydon (Hyde); 3, Mr. and Mrs. Batchelor (Loyne). Section K—Egglayers (Pairs): 1, Mr. and Mrs. Blades (Cresswell); 2, H. Marshallena (Oldham); 3, E. Smith (Sheffield). Livebearers: 1, Mr. and Mrs. Blades (Cresswell); 2, Mr. and Mrs. Cobb (Belle Vue); 3, Mr. Buxton (Hyde). Section L—Breeders (Livebearers): 1, Mr. and Mrs. Cobb (Belle Vue); 2, J. Rowbottom (Hyde). Section M—Goldwater Fancy Goldfish: 1, C. H. Whiteley (Accrington); 2, S. Walsh (Accrington); 3, Mr. and Mrs. Toyne (Sheffield). A.O.V. Goldfish: 1, Mr. and Mrs. Toyne (Sheffield); 2, C. H. Whiteley (Accrington). A.O.V. Goldwater: 1, 2 and 3, S. Walsh (Accrington). Best Fish in Show: L. Ankers (N. Staffs.).

TABLE SHOW results for July of the Suffolk Aquarists and Pondkeepers Association were as follows: Tropical (Labyrinth): 1, R. Turner; 2, D. Howard; 3, N. Crown; 4, L. Jarmy. Coldwater: 1, Master G. Beeston; 2, M. Hart.

At the August meeting of the British Marine Aquarists Association (West Midlands Group), members R. Edwards and J. Vichery had some fish to show members that are not in any books and none of the members present could identify them. J. Vichery made a trophy in the shape of a seahorse which he gave to the B.M.A.A. to give away at a future show. I. Hodgkiss gave a slide show. On these slides there were five stills that had come from two members who live in Australia. These new members just go into the sea to get the fish they want. On the five slides there were fish that have never been seen in England so far as our members know. These Australians have to go a distance of about 65 miles on horseback most of the time to get these fish. Member B. Pleewood had a shipment of marine fish at his shop and, three days later, he found some of the bags still had a few fish in. These fish were still alive. This shows that some of the marines are very hardy indeed. The meeting ended with a general discussion.

DUE to some unforeseen commitments, J. Haynes B.M.A.A. 28, the association chairman of judging and show standards is having difficulty in handling the paper work; therefore L. H. Doubleday, B.M.A.A. 14, has become the secretary, taking some of the pressure off J. Haynes. In the future, any aquarist Association who wishes to hold a Marine class in their show and requires an expert judge, please contact: L. H. Doubleday, B.M.A.A. 14, 69a Newton Road, Torquay, TQ2 7HL.

The August meeting of the Peterborough Fishkeepers Association took the form of a general discussion and E. Allen (husband of Mrs. H. Allen, secretary of the British Koi Keepers Society) gave a very interesting talk on the pond construction and under-gravel filtration suitable for keeping Koi. The secretary is C. A. Beakes, 62 Wisbech Road, Thorney, Peterborough, PE6 0SD.

OBITUARY

On 26th August suddenly, R. E. Dudley, Publicity Officer to the Goldfish Society and Founder/Chairman of South Park Aquatic (Study) Society.

So the world of coldwater fishkeeping has lost one of its champions. Ron Dudley was one of the most enthusiastic aquarists I have met—fancy goldfish, cultivated native and foreign species, all were to be found in his two fish houses and several garden ponds. He had a particular interest in the North American Centrarchidae family. Ron Dudley was an "ideas" man and usually working upon some scheme to improve the well-being of his stock. He had recently completed a circulating water cum filtration system to serve three tanks of 11 ft. proportions.

As Publicity Officer to the G.S.G.B., Ron went out of his way to man the Society stand at various exhibitions and visiting aquarists were sure to receive sound advice. In the South Park Aquatic (Study) Society he was an active Chairman taking it upon himself to be the delegate to the B.M.A.A. general assemblies. Through his leadership this Society has become unique in the south-east of England in that it caters almost entirely for a coldwater membership. The many friends of Ron in the hobby will join with me, I am sure, in expressing deepest sympathy to Marguerite Dudley and to David, his son. It is good to hear at the time of writing that they both will be continuing their own activities in the hobby.

R. M. Whittington,
Bulletin Editor, G.S.G.B.

SECRETARY CHANGES

Billingham A.S.: D. Young, 16 The Causeway, Billingham, Teesside.
Hull A.S.: J. Parker, 79 Springfield Avenue, Brough, E. Yorkshire.

Llantwit Major A.S.: S. Nelson, 48 Vere Street, Cadexton, Barry, Glamorgan.

Peterborough Fishkeepers Association: C. A. Beakes, 62 Wisbech Road, Thorney, Peterborough, PE6 0SD.

Land of Burns A.S.: J. Wilson, 46 Dundonald Road, Troon, Ayrshire. Tel: Troon 1942.

B.K.A. (Manchester) Group: T. Thorne, 10 Harthead Close, Manchester, M11 1HG. Tel: 061-370 1470.

B.K.A.: K. Jenkinson, 12 Whitdalehead Road, Whitburn, West Lothian, Scotland.

Rotherham and District A.S.: Mrs. J. Airton, 9 Best Lashes Avenue, Rotherham, Yorks., S60 4BL. Tel: Rotherham 3538.

VENUE CHANGES

Banbury and District A.S.: All meetings from 10th September will be held at The Clubroom, Wheatleaf Inn, George Street, Banbury.

Leicester A.S.: The meetings held on the first Thursday in the month, are now held at the St. Matthew's Community Centre, Malabar Road, Leicester.

CHANGE OF NAME

The W.K.F.B. A.S. will in future be known as **Chelmsley A.S.** The secretary is R. J. Healey, 2 Lawnsdale Close, Colleshill, Birmingham, B46 1HS.

NEW SOCIETIES

Thetford and District A.S. (member of E.A.P.A.): New society has been formed in Thetford. Meetings to be held monthly. As yet have no permanent headquarters. Secretary: Peter D. Hunt, 17 Beacken Road, Thetford, Norfolk. New members very welcome.

The New Mills and District A.S. is now well established and enjoying a full and varied programme of events. New members will be made most welcome. Meetings are held on the second Wednesday of each month at the Queen's Arms Hotel, New Mills, at 8 p.m. Secretary: Anthony A. Coffey, 7 Longlands Road, New Mills. Tel: New Mills 43889.

Hendon and District A.S.

16th Annual Congress

The above event will be held at the usual venue, Whitefield Secondary Modern School, Claremont Road, Hendon, N.W.2 (close to the Brent Cross flyover), on Saturday, 11th November, 1972, commencing at 6 p.m. The speaker this year will be Leif Christensen of Denmark, one of the foremost aquarists on the Continent. His subject will be "Fishes of the World" and the talk will be illustrated with colour slides. This talk will be of immense interest to novice and expert alike and as he speaks excellent English, no language problems are envisaged.

Many of the important personalities in the hobby will be in attendance and once again they will be available to discuss the various aspects and any problems of fishkeeping. Hendon have always endeavoured to obtain the best in Europe and stage one of the more successful ventures of this kind, and are confident that this year will be no exception. Refreshments are available and there is ample car parking space.

Tickets can be obtained, price 30p each (Juniors under 16 years 20p), from R. Maynard, 90 Conswold Gardens, London, N.W.2.

AQUARIST CALENDAR

1972

1st October: Baling and District A.S. Open Show at the usual meeting place: Northfields Community Centre, Northcroft Road, W.13.

1st October: Herton County A.S. Annual Open Show at Stephenson House, Richard Street, Herton-le-Hofe, Co. Durham. Benching 12 noon to 2 p.m. Further details available from Secretary, Mrs. C. Wilkinson, 4 The Meadows, West Rainton, Houghton-le-Spring, Co. Durham.

1st October: Chesterfield and District A.S. The First Open Show will be held at Clay Cross Social Centre, Chesterfield Road, Clay Cross, Near Chesterfield, Derbyshire, Exit 29 off M1, 4 miles to Clay Cross. Details from Show Secretary, D. Stone, 237 North Wingfield Road, Grassmoor, Near Chesterfield.

1st October: Herton A.S. Second Annual Open Show, Herton Community Association Centre, South Market Street, Herton-le-Hofe, Co. Durham. Further details from secretary, R. Riley, 32 The Meadows, West Rainton, Houghton-le-Spring, Co. Durham, DH4 6NP.

1st October: Leicester Fishkeepers Club is holding its Open Show at St. Marks Church Hall, Belgrave Road, Leicester. Benching will be from 11 a.m.—1 p.m. and further details can be obtained from D. Freeman, show secretary, 30 Sheffield Street, Leicester, LE3 0GX.

7th October: Cardiff A.S. Open Show to be held at the G.K.N. Sports Club, Sloper Road, Grange Road, Cardiff. Further details from C. Turner, 146 Arran Street, Routh, Cardiff.

7th October: East London Aquarists and Pondkeepers' Association Open Breeding Show, Ripple Road School, Barking, Essex. Schedules from show secretary, J. Vickers, 13 Irons Way, Romford, Essex.

8th October: Buxton and District A.S. Second Open Show, The Pavilion Gardens, Buxton. Full details later.

8th October: Ashington and District and Blyth and District Aquatic Societies first Open Show will be staged in the Y.M.C.A. Hall, Station Road, Ashington. Details and show schedules from G. Hunt, 9 Tyne Street, Ashington.

14th-15th October: British Aquarists Festival, Belle Vue Zoological Gardens, Manchester.

22nd October: Sherwood A.S. Open Show, Rainworth Recreation Centre, Warsop Road, Rainworth, nr. Mansfield, Notts. Show secretary, J. Igoe, 25 Marples Ave., Mansfield-Woodhouse, Notts.

22nd October: Open Show of the Irish Tropical Fish Society at St. Michaels School, Grosvenor Road, Rathmines, Dublin. 6. Show schedule from Sean Mooney, 1 Carrick Hill Road, Portmarnock, Co. Dublin.

22nd October: Midland Aquarist League Show staged by Coventry Pool and Aquarium Society at the Foleshill Community Centre, Foleshill Road (A444), Coventry. Open classes: 1, A. V. Cichlid; 2, A.V. Livebearer; 3, A.V. Catfish; 4, A.V. Tropical Egg-layer Pairs. Benching till 2.30 p.m. Details from S. Woodruff, 32 Ridgeway Avenue, Coventry.

29th October: Doncaster and District A.S. are holding their third annual Open Show at The Plough Inn, Doncaster Road, Armthorpe, nr. Doncaster. Benching to be from 12-2 p.m. Inquiries to G. Kilvington, 51 Anelay Road, Balby, Doncaster.

29th October: Doncaster and District A.S. Third Open Show.

29th October: Newcastle Guppy and Livebearer Society. Open Show at Central Hall, Gosforth, Newcastle upon Tyne 13. Livebearer classes, 17 Egg-layer Classes. Schedules from J. A. Leidler, 19 Aln Avenue, Gosforth, Newcastle upon Tyne 3.

5th November: Mixenden T.F.S. Open Show at the Mixenden Community Centre, Clough Lane, Mixenden, Halifax, Yorkshire. Further information from the Secretary, S. Leedham, 74 Clough Lane, Mixenden, Halifax.

12th November: Creswell and District first Annual Open Show to be held at Workop Sports Centre, Valley Road, Workop. Schedules available from show secretary, Mrs. H. Blades, 13 Westminster Close, Workop, Notts. Tel: Workop 6563.

12th November: Hardpool A.S. Open Show in the Longcar Hall, Seaton Carew. Schedules and details available from show secretary, J. D. Watson, 42 Sydenham Road, Hardpool, Co. Durham, TS25 1PZ.

28th November: Aireborough and District A.S. Annual Open Show, Yeadon Town Hall, Schedules from secretary, 3 Greenes Avenue, Yeadon, nr. Leeds, Yorkshire.

3rd December: Horsforth A.S. Third Open Show at the New Civic Hall, Bradford Road, Stanningley, Pudsey. Schedules from the hon. show secretary, Miss Heim, 29 Wellington Road, New Wortley, Leeds, 12. Phone Leeds 21625.