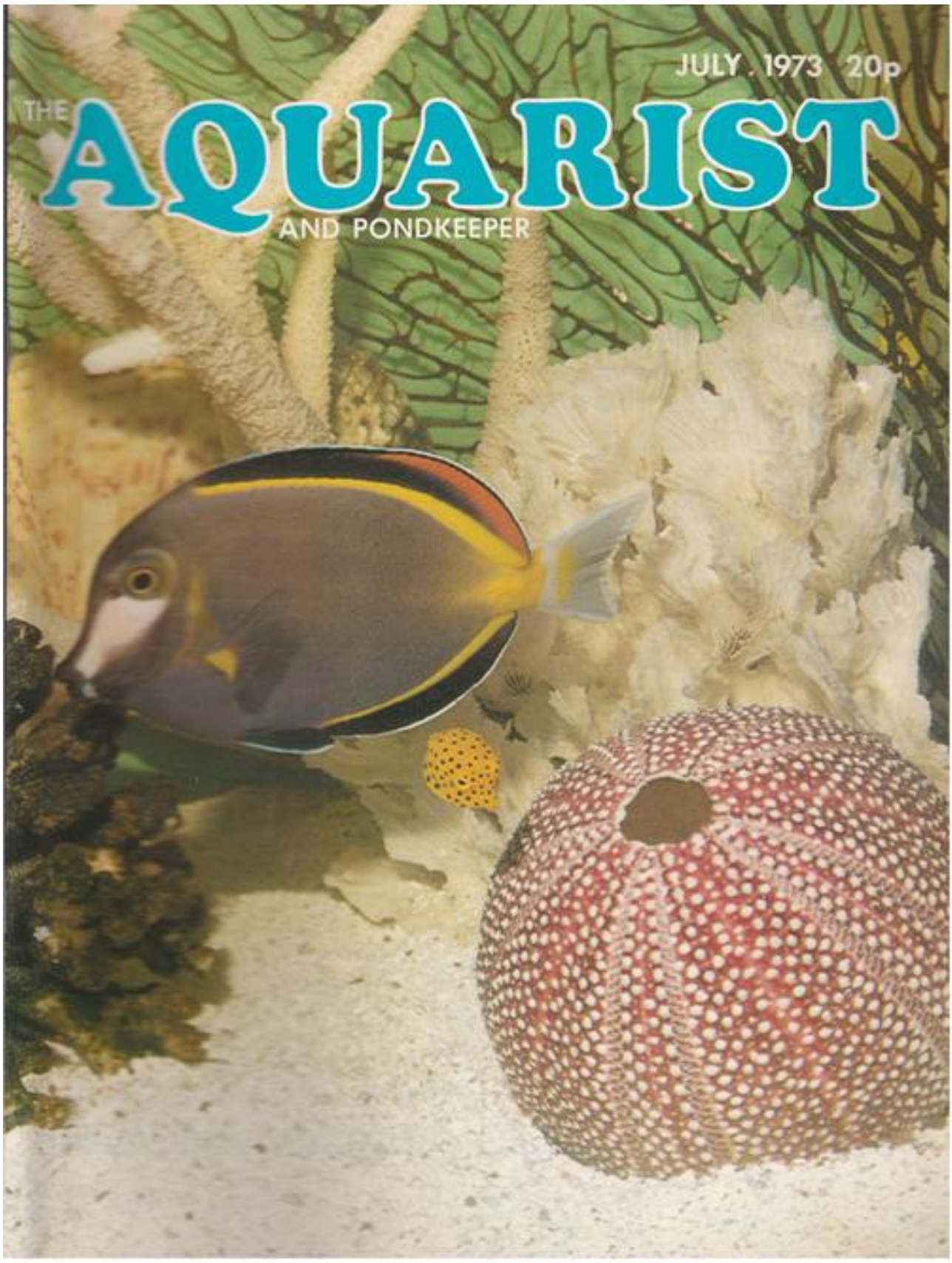
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THE
AQUARIST
AND PONDKEEPER

THE AQUARIST AND PONDKEEPER

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Our Cover

A Tropical Marine Aquarium displayed by Tottenham Aquarist Society at Alexandra Palace on the occasion of the 1971 Fishkeeping Exhibition. Fishes illustrated are: *Acanthurus japonicus* and juvenile boxfish *Ostracion cubicus*.

Contents

WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author

THE FIRST LETTER in this month's feature comes from Mr. P. Carnochan, of 2 Perrie Street, Lochee, Dundee, Scotland, and makes the suggestion that it would be useful if some of this magazine's advertisers would start an aquarium book club, working on a credit basis. "I'm sure that many readers would like to own some of the excellent books advertised in the magazine, but, like me, may not be able to afford them all," writes Mr. Carnochan. (I'm not quite sure how such a scheme might be operated, but a scheme by which one could buy some of the more expensive books, on extended credit, could be useful. Perhaps some of our advertisers who sell large numbers of aquarium books would consider some sort of scheme along the above lines?)

In the April edition I said that I would be interested to learn something about the aims and objectives of the Pet Trade Association. My comments resulted in a comprehensive account of the Association's activities, supplied by Mr. Alan Horn, B.V.A./P.T.A. Dip., of Lobthorpe Tropicals, Lobthorpe, Grantham, Lincs. Mr. Horn writes: "The name of the National Organiser of the P.T.A., who has, as you say, recently resigned, is Mr. S. C. (Sam) Jacobs. One cannot fail to benefit, not only from being a member of the P.T.A. but also a holder of the Diploma which is awarded jointly by the Pet Trade Association and the British Veterinary Association. The P.T.A. is a non-profit making organisation, limited by guarantee, designed to try not only to improve standards generally and thereby benefiting the trade, but also to improve relations between pet traders and veterinary surgeons. The symposium for pet shop owners and traders members of the P.T.A., in 1972, was held in September at the B.V.A. offices. Subjects included: (i) Prevention of diseases in rodents and rabbits; (ii) The veterinary problems of offering dogs and and cats for sale; (iii) Pet shop management; (iv) Jurisprudence; (v) Management and diseases of fishes; (vi) Reptiles; and (vii) Diseases of aviary birds.

"Following the Symposium, a three hour written examination took place on 9th October, followed by an oral examination (not only on one's speciality, but on any aspect) on 23rd October, both at the Royal Veterinary College. Those pet traders who already hold the Diploma claim that it has improved their business. In Holland it is compulsory for pet traders to have passed a state examination before setting up business.

"Of course it may have been difficult for many traders, assuming they are members of the P.T.A., to attend the Symposium and subsequently the examination for any number of reasons. But these difficulties and reasons (and here I quote Mr. S. C. Jacobs) are a measure of value placed upon the Examination to the individual and trade as a whole. If the examination were compulsory, as it may well become one day, would those who hesitate now still find it impossible to take part?

"So Mr. Whiteside, although you are not alone in this, instead of grumbling as you and your fellow writers do so much about products and methods and fish and so on, why not look around for a P.T.A./B.V.A. Diploma holder who makes it his business to test products and methods before recommending, stocking and selling. I found Lobthorpe Tropicals with one fish house and sixty tanks in September, 1971. In November, 1972 I opened my second fish house with fifty more fully stocked tanks. I also have a one hundred and fifty tank breeding section from which it is my ambition in two years' time to retail as near 100 per cent as possible Lobthorpe bred fish. By the autumn of this year I hope to have as well another room which will be the shop selling and stocking the dry goods apart from the fish which now include ten marine tanks, and an office. I advertise installations and supply the complete units. I undertake maintenance and have secured the contract for my local education authority's installations in schools, colleges, etc.

"I also found time and money to attend the Symposium and examination in 1972. This necessitated rail fares to London three times, hotel fees, Symposium and examination fees, etc. However, I have the reward and satisfaction of being the only P.T.A./B.V.A. Diploma holder in Lincolnshire. Although I am an aquarist this qualification does enable me to handle other lines confidently. So, do promote us holders, since we are dedicated and we do care as this expertise is something quite different from that required to sell dry or tinned goods only."

but imagine that they would require conditions similar to those which suit the more common varieties of angelfish.) Mr. Cornwell's 36 in. × 12 in. × 15 in. Jewel tank is filtered by two Windmill undergravel filters, and lighted by a 20 watt Gro-Lux tube, together with two miniature 15 watt tungsten bulbs. Both bulbs and tube are left on for 10 hours per day; the bulbs alone are used at night "to give a nicely shaded effect". Recently, Mr. Cornwell replaced 7 gallons of his tank water with filtered and heated rain water. After two days a large build up of *algae* was noticed in the water and on the plants. Mr. Cornwell read some books, and decided that the reason was that the water was soft and not acid, "making it prone to *algae*". He put a box filter, complete with peat filling, into the tank, and within two days the water had cleared. He hopes this point may be of use to other readers. Mr. Cornwell would like to see *The Aquarist* appear each fortnight, and he would like to see club news and dates dropped, and replaced by more advertisements. He considers that the advertising is most informative and give a useful insight into new products. He would like to see a series of "comparable product tests", starting with undergravel filters. He says he learned the hard way: box filters, external, and finally, undergravel.

8A Park Avenue, Finchley, London, N.3, is the address which heads Mr. K. Ballard's letter—and he writes about a number of subjects. Mr. Ballard says that light bulbs will blow easily if there is no cover on a tank. An appropriate cover can be of glass, or clear, stiff plastic. The spray from aerators, and evaporation, can cause dampness in fittings. Hoods and metal reflectors, and metal lamp holders, should be earthed. "Bakelite fittings should not be used as they will over-heat," says Mr. Ballard. In reply to a previous letter, Mr. Ballard says that there is nothing wrong with plastic tanks. The cause of fishes' deaths may have been due to using tap water which may have been neither fresh nor pure, he considers. Contra-Chlorine should be added to the water about one hour before fishes are introduced, Mr. Ballard states. To remove *algae* from plastic tanks, he suggests the use of a "salty cloth which is a little damp". He says that many fishes and snails will eat some *algae*; and that *algae* gives off oxygen and absorbs nitrites. Mr. Ballard says that all-glass tanks can have covering "framed" made from wood or plastic angle, to hide the edges and corners. He goes on to say that beginners should consult their dealers about the sort of "problems which you take great pains to list, and these are simple to solve. The more advanced aquarist may then have column space." (As my columns are open to anyone with an opinion to express, there is opportunity for even the most advanced aquarist to express his views; however, beginners also have the right to state their views. I do try to strike a balance between both extremes in the letters which I include in the feature. As there are few "absolutes" in our hobby, the opinions of the beginner and of the more experienced hobbyist can be equally valid. Also, I do not think that it would be unfair to assume that *The Aquarist* receives so many queries because readers have probably been unable to obtain satisfactory answers from books, or other sources. Perhaps some of those who have sent queries to this magazine could let me know *why* they found it necessary to do so. I'd be pleased to hear from them.) Mr. Ballard ends by giving his "ten commandments" for beginner aquarists: (1) No one should keep any pet without first learning about it; (2) Your dealer will advise on how to set up a tank; (3) Do not try to keep marines without having had two years' experience with tropical freshwater fishes and plants; (4) Don't waste money on cheap equipment—but there is no need to buy the dearest; (5) If necessary, join a club before keeping marines, and read plenty of books about life in the sea; (6) Use good quality filters and gravel in freshwater tanks—and good quality salts and foods with marines; (7) Be kind: learn first, and keep learning; (8) The bigger the tank the better —particularly for marines; (9) a Few fishes which are healthy are better than none! (The tenth "commandment" appears to have been omitted from the list.)

Mr. R. Riley writes from 35 Russell Road, Hall Green, Birmingham, B28 8SF, on the subject of *algae*. He recently had an infestation "of that disgusting 'blanket weed' or thread *algae* which grew faster than it could be removed". Mr. Riley keeps "sucking loaches," which removed some of the different types of *algae*, but not the thread type. He recently purchased six American flag fish, put three in each tank, and "these little beauties" began to devour not only the green, but also the thread *algae*. His tanks are improving daily, "thanks to these colourful little fish".

Mr. D. Cottam is 18 years old, and lives at 57 Kingstown Road, Carlisle, Cumberland, CA3 0AM. He writes: "... I think it would be unwise to publish *The Aquarist* every fortnight as it would be harder to obtain. I am saying this because even though my father owns a newsagent's shop, the magazine is often four weeks late." Mr. Cottam goes on to reply to my comments in the May edition. He says that when he first started keeping fishes, had a terrapin which lived peacefully in a tank with guppies, mollies and small tetras. Perhaps because of lack of knowledge, and a poor diet, the terrapin died. These events took place eight years ago. Last Christmas, Mr. Cottam bought a red-eared terrapin, and provided it with a tank of its own. Recently its tank was needed for blue acaras,

and because of lack of room the terrapin was "dumped" into a tank of cichlids—some of which were quite large. The tank in question has a water level which is 1 in. below the upper frame of the tank, and a 4 in. piece of driftwood serves as a sun-bathing platform for the terrapin—which is now about 3 in. long. The creature has not yet paid any attention to the fishes. Mr. Cottam's ambition, when he leaves school and finds a job, is to breed and rear discus.

Mr. R. Prior's home is at 6 Taylor Cottages, Ridge, Potters Bar, Herts., and his 36 in. × 12 in. × 15 in. tank is lit by a 15 watt Gro-Lux tube situated at the centre, and a small 15 watt clear, tungsten bulb at either end. The tank was set up in December, 1972, complete with two Algarde undergravel filters. A good layer of peat was placed between two layers of gravel, and four small pieces of slate, and a piece of bleached driftwood, were used as decorations. Mr. Prior bought the following plants: 1 doz. *Vallisneria*, 1 doz. *Ambulia*, six green *Cabomba*, six assorted *Aponogeton* species and six large and six small *Cryptocoryne* species. These were all planted, and the tank looked very decorative. The water used consisted of half fairly hard tap water and half de-ionized water, giving a final p.H. of 6·0. Plants were put in place two days after the water—and everything was fine for six further days; then all the *Cryptocoryne* plants simultaneously lost their leaves within a space of one and a half days. By this time the fishes had been added, and they were in fine form. All the other plants in the tank remained in good condition. Now four weeks later, the *Aponogeton* species are growing new leaves at a rate of 3 in. per day; the Vallis have at least doubled in number; and the *Ambulia* are growing well. Duckweed is now growing on the water surface, and the *Cryptocoryne* plants are all shooting out new leaves! Mr. Prior wonders if the water was too fresh for the *Cryptocoryne* species, or if the lighting was too bright, thus causing the original leaf loss. (I have presented my vague postulations on this subject several times, but no one has ever supported or rejected them. Of the two reasons given above, I should say that the former is the more likely cause of the two—if one accepts that either is the probable cause.)

94 Kents Hill Road, Benfleet, Essex, SS7 5PJ, is where Mr. R. Phillips lives. He writes: "I would like to congratulate you on an excellent feature. It was, actually, this magazine which started me in the hobby of fish keeping in earnest. About a year ago, although I had a tank of tropical fishes, it was sitting in the corner going blue-green with *algae*, and looking revolting. The reason was that I had far too many fishes in it, and very few plants. On reading one of the letters about *algae*, I immediately sold some of the fishes and bought a load of plants. The tank has been beautiful for the past several months now. The magazine also introduced me to the keeping of terrapins. I read the article by Mrs. Peaker in the February edition, and a couple of weeks later I had cleared out a second tank of baby fishes—and in went four terrapins! Having had experience of this, my mother got rather worried when I got interested in the article on the green iguana in the March edition. Terrapins were all right, but iguanas would be going too far! I'm in agreement with Mr. Bear in the April edition. I would go even further and say that earthworms are an ideal food for terrapins, except that I dig mine from under the compost heap in the garden. With regard to the calcium that terrapins need for their shells, I would recommend a few very small snails in the tank. The terrapins eat the snails and their shells. My favourite fish was a male flag fish. Together with a female it spawned in my community tank. The male did his best to guard the eggs, but at that time I had a lot of guppies which managed

to eat most of the eggs. I managed to salvage a few, and have six half-grown flag fish now.

" The male fish had the most fantastic array of colours, mainly red and green, and he had a large black spot on the centre of each side. He varied in colour from dull brownish when frightened, to really bright red and green when happy, or just fed. I should not begrudge him dying, though, because he was nearly seven years old, at a guess. There are many different kinds of pond life which can be kept in an aquarium provided there are no fishes there. Water beetles, water spiders, *Daphnia*, cyclops or hydra, although all quite small, make good subjects for a small aquarium. Newts, tadpoles and axolotyls are larger inhabitants for an aquarium with a few rocks sticking out of the water." Raymond, who is 15 years old, has noticed that there seems to be an increasing number of teenagers writing to this feature. He wonders just where they get the time, and says that he had to sprain his ankle to get time off from school to write this letter. (I hope it wasn't done on purpose, Raymond!) He particularly

enjoys the "Junior Aquarist" articles, and those written by the Hansens on their experiences with fishes.

Raymond doesn't use heaters in either his tropical or terrapin tank; he finds that the bulbs heat the water satisfactorily. Over his 24 in. tropical tank he has two 18 in. Gro-Lux tubes, and one 100 watt tungsten bulb over the terrapin tank. His Gro-Lux tubes have lasted him for nearly three years—and he got them second-hand from a neighbour!—yet he finds that ordinary bulbs go very frequently. He says that he will certainly try the rough service bulbs which I recently recommended. He ends his letter by saying: "Thank you and the rest of '*The Aquarist*' team for a wonderful magazine." (Thank you for a very interesting letter! Your words of thanks are much appreciated by all concerned!)

On to the subject of Koi, with a letter from Mr. F. Ahrens, of Greystones, Bunstrux, Tring, Herts. Some years ago Mr. Ahrens purchased his first Japanese Koi—about 20, from 4 in.-5 in. in length he lost all but one within six months. He then became a founder member of the British Koi-Keepers' Society and found with other members, that imported Koi of under 6 in. had a very high mortality rate. He eventually obtained some adult stock, and after infertile spawnings in 1971 he had his first success last year. The succession of events was as follows: May 18th—preliminary chasing of females; 23rd—spawning in full swing at 5 p.m.: black and white 13in. female "spawned" by Ogons, Asagi, Shusui and Sanke males of 10in.-18in. in length continued until darkness at 9 p.m., everywhere in the pond where there were *Anacharis* and other plants: water temperature 64°F: eggs and plants placed in plastic bath: hose "run through them"; eggs placed in indoor containers, with aeration, at 78°F.; 24th—most eggs looking infertile: on closer examination a few contained a developing embryo: a few drops of Liquifry added to water; 26th—first fry hatching; 27th—good number of fry seen, and some free-swimming: fry ¼in. long: Liquifry feeding continued; 30th—fry feeding on Liquifry, Frygrain and brine shrimp: some babies now pink, others dark; 31st—babies feeding well: ¼in. long: estimated number 200-300; June 12th—largest fry ¾in. long: gold ones showing dark patches: feeding on crushed pellets: temperature lowered to 70°F.; 18th—feeding on white worms and crushed pellets; 28th—largest babies now 1in.: good variety of colours developing: temperature lowered to 66°F.; July 8th—130 largest ones placed in outside pond; 22nd—largest now 1½in.-2in.: the "wild" coloured ones now developing silver and gold on fins, head and under-belly; 23rd—smaller ones (200) now transferred to outside pond: greater variety than among the larger fish; October— after disposing of some to B.K.K.S. members the rest brought inside: temperature kept at 55-60°F.: fed twice per day; February 1973— the largest now 4in.: all will be placed outside in March or April, and grown on to winter outside next year. Mr. Ahrens ends his letter by saying: "Anyone interested in Koi cannot do better than join the B.K.K.S. and benefit from the experience of those who actually keep and breed Koi." (A most useful and interesting account, Mr Ahrens. Wish I had some Koi—and a pond!)

I never thought I would see the day when I would be able to say that I had seen photographic evidence of a pond fish being fed by hand, from a baby's feeding bottle—until Mrs. H. Allen sent me a coloured slide showing just that! Mrs. Allen is the Secretary of the British Koi Keeper's Society, and together with her slide and letter she kindly sent me some copies of the Society's latest Newletters. She has been keeping coldwater fishes for nearly thirty years, and of all the fishes she has kept, her favourite is "Fred"—a "magnificent, golden Ohgon Koi. (What exotic names they have!) Fred has given Mrs. Allen great joy ever since he was purchased a few years ago—along with "Sylvia", a gold and silver mirror-scaled Koi which is 14in. long. These two fish have always shown affection for one another, and one is rarely seen without the other. They always lie alongside each other in the pool at night. Fred is now 15in, in length and in superb condition, having always "lived off the fat of the land" since he was bought. During the summer he is remarkably tame, and greets his owner when she goes out in the morning to feed her twenty five 5in-15in. Koi in one pond. "When time permits, and to prove he is a big old 'softie', I mix him a bottle of 'Creamed Fish Dinner', attach a teat, and he will then proceed to suck hard until the bottle is empty," writes Mrs. Allen. (And her coloured slide proves it beyond doubt!) She says that she has not yet had to "burp" the fish!!! Sylvia also feeds from the bottle if given the chance. Mrs. Allen continues: "I impatiently await the summer to see Fred at the surface of the water revelling in the good life, eating his head off, and doing occasional leaps clean out of the water, as all carp do. At present he is patrolling the shallows, mainly feeding on earthworms and tinned peas, until the cold winds stop blowing. Later events may prove that Fred should be named Freda, but who cares! Any fish that brings with it such pure joy in ownership will always be remembered, and moreover, I believe he remembers me, as occasionally he will stay in the established feeding area when I am in the vicinity, although the water is still extremely cold at about 7-8°C. Long live Fred!" (Can anyone better the true story of Fred and Sylvia? It should certainly take some þeating!) Mrs. Hilda Allen's address is 1, Anthony Close, Peterborough, PE1 3XU, should anyone want to obtain more details about the B.K.K.S. (Having recently heard from specialist groups who keep Koi, and killifish, I'd be interested to receive letters from any other groups who specialise in particular fishes—of

plants. I'd be pleased to devote some column space to them if they'd care to write.)

In the May feature I referred to Photograph 1, and said that it showed one of my planted tanks with an air stone operating in it. As readers will have gathered the photograph which appeared was not the one to which I referred— in fact, it was not even one of my photographs. I assume that things must have got a little muddled along the line. However, my comments on air stones brought a welcome letter from Dr. Neville Carrington of Interpet, and I am sure that he will not mind if I quote part of his letter. Dr. Carrington writes: "In reading your article in the May edition of "*The Aquarist*", I was amazed to read that you no longer use air stones....I am happy to tell you that every one of my tanks has some form of water circulation. This may be a Powerstreem filter or a Super Twin but in all other instances it is an air stone." Dr. Carrington continues: "I believe that most aquarium fishes just do not get enough exercise. Even in a still pool in natural conditions the currents present are probably stronger than those produced by an air stone in an aquarium. Certainly in my experience fishes always look much more healthy when the water has some constant movement. I have carried out many experiments to convince myself of this. My view is in line with that of many German authorities. I recall a few years ago hearing the Editor of 'Datz' express the same view at the Hendon Convention. I maintain that one of the most fascinating aspects of our hobby is that two people with conflicting views can both be right. We are dealing with a biological system in which there are so many interacting variables which must, taken in conjunction, bring success or failure sometimes unexpectedly with seemingly opposite conditions." (Although I do not use air stones as such, I should possibly have mentioned that all my tanks are fitted with a Powerstreem or air operated outside filter. I keep these operating for about fourteen hours per day, thus ensuring clean tanks with a good water circulation. Unfortunately, my university studies leave me little time for attending to a lot of tanks at present, and I thus have only a small number of tanks in use. For this reason I can afford to have an outside filter on each tank. Having once had the pleasure of visiting Dr. Carrington, and seeing his many thousands of healthy fishes, I can confirm that his techniques are at least as successful as mine. I would be pleased to hear other readers' views on the subject of air stones; Dr. Carrington's letter was the only one on the subject which I received this month).

Photograph 2 shows a young, female platy. Would you agree that platies are the easiest of tropical fishes to breed? I ask because a number of readers have recently written to say that they have found it difficult to breed guppies!

Well, that's this month's space used up. For a future edition please send me your opinions on the following: (a) Have you managed to grow any "aquatic" plants above water level? If so, how, and what kinds? (I ask the question because before I went to Switzerland last month, I cleared a lot of Indian fern and water wisteria out of my tanks, and placed them in a half full bucket of water in my unheated greenhouse. A couple of weeks after my return I looked into the bucket and found that both types of plants had produced strong and modified leaves and stems above water level. I suspect that the water wisteria would have bloomed soon, but I ended the "experiment" yesterday when I gave all of the plants to an aquarist who is setting up his first tank.) (b) Do you supply your fishes with any type of fresh, green foods? If so what, and how? (c) What sort of aquarium "background" do you use? (d) What plant grows best in your tropical or cold water tank, and under what conditions do you find that it thrives? (e) What has been your most costly failure in keeping fishes, and why? (f) What do you consider to be the most useful aquarium book on the market, and what is its special appeal? (g) What have been your findings as regards the effects of V.A.T. on our hobby? I look forward to receiving more of your letters for the July edition. Best wishes until then!

SPECIAL NOTICE TO 1972 CUP HOLDERS

All winners of perpetual trophies should now return them to the Show Secretary without delay

BREEDING

Herotilapia multispinosa

Written & Illustrated by T. Stevenson

WHEN I PURCHASED a pair of these cichlids they were being sold as "Dwarf Cichlids" for 18p each. It took a number of months and many textbooks to identify the fish as *Herotilapia multispinosa*, an apparently little-known fish in this country. But the real surprise was to follow: I had acquired a mated pair which successfully bred. As a result I hope to be able to describe this delightful fish adequately for anyone who may already have, or come across them.

History

Herotilapia multispinosa (Rainbow Cichlid)

The genus *Tilapia* is an African Cichlid, although R. J. Goldstein classifies *Herotilapia* in his book under the Cichlids of America. The prefix Hero- signifies pseudo which probably means that classification of the fish has been difficult. One difference is that *Herotilapia* possess tricuspid teeth whereas *Cichlasoma* possess conical teeth. Information on this fish is in very short supply and, although Goldstein states that the fish is very easy to breed and it could well become a very popular aquarium fish, it seems strange that he does not enter into detail as one might have expected.

Description

The photographs show the main pattern variations of the fish. The three variations showing the large dots and stripes are non-breeding patterns—the picture where the dots have disappeared, and the side and underbelly are completely black, represents their coloration during spawning, subsequent hatching and rearing of the young. Each time the fry were removed from the parents, i.e. when, in the community tank, the fry became too active to manage, the black colouring disappeared as soon as the parents had realised the fry had gone.

The sketch and comments below describe the colour and appearance of the fish better, I hope, than a detailed description.

They lack, perhaps, the sparkle of other well-known cichlids, and they have an insatiable appetite for plants, although they do not stir up or dig in the bottom of the tank.

The adult male is about 2in. long, the female, perhaps, being smaller by about ¼in. The female also does not appear as powerfully built and as "mighty" as the male. Coloration is, however, identical, and I found it impossible to tell male and female apart until spawning.

Fin structure—D.XVII-XVIII/8-9. A.X-XI/9-10 (by observation).

They are mildly aggressive only during breeding and this aggressiveness is used merely to warn off intruders.

Breeding

No particular water condition other than temperature appears to be necessary.

Being very much an amateur and comparative beginner, the first spawning took me by surprise. Spawning, or its inducement, took place as a result of circumstances. For a number of months I had kept the temperature in the region of 76/80°F and nothing happened. Then one day I noticed that the cichlids, together with a few other fish in the community tank had White Spot, so I took preventative measures using Methylene Blue and raising the temperature to approximately 88°F. After a week or two the White Spot was cured and I dropped the temperature, but this time it did not drop as far as before; the range settled out at 81°-86°F. I did not have the opportunity to re-alter the temperature, in fact I paid very little attention to the fish for the next few weeks.

Above and right: Male fish showing pattern variation.

The next thing I spotted was the cichlids behaving in a very peculiar fashion, and on investigation I found that the fish had laid a considerable number of eggs. On a subsequent spawning a few weeks later, it was noticed that the eggs were laid on a flat, smooth stone rather than in the flower-pot which had been placed in the tank for breeding/decorative/hideout purposes. They were laid a few at a time in a pile then gently patted down on the rock. This would appear to serve a number of purposes:—

(*a*) To enable the adhesive eggs to stick to the rock;
(*b*) To provide a better chance of each egg being fertilised;
(*c*) To facilitate easier picking out of unfertilised eggs;
(*d*) To allow better circulation of water around the eggs.

The eggs were laid over a period of several hours, and after each expulsion and patting down the male was allowed access to fertilise whilst the female chased away intruders and jealously guarded the sacred site. The size of the egg was about that of a knob-pin head and they were always laid on a flat stone in preference to the common flower-pot method for cichlids.

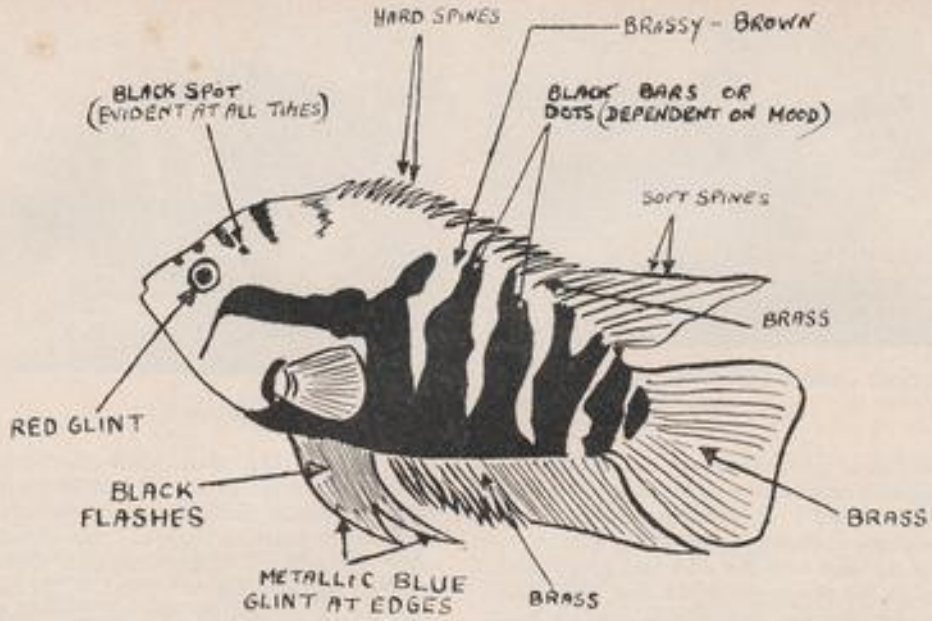
In the case of my cichlids, the eggs were light brown in colour, although it is known that the colour of eggs will vary according to the fish's diet.

The two fish took it in turn to guard the eggs. Whilst one guarded, the other investigated the area around the site, generally warded off unwelcome visitors and fed. The other fish at this time carried on fanning the eggs and generally cleaned the area in typical cichlid fashion.

After a day, little black dots were noticed in the eggs, indicating the embryo fish. Two days later the eggs were all collected from the rock and were placed in a less noticeable position. Another two days passed and the fry had hatched, and they remained in that spot for a further day, after which they became more adventurous and started to wander away. At this point the parent cichlids' task of protection became increasingly more difficult and the threat from the other community tank inhabitants became much greater. So I decided to syphon off the fish for their own protection and for the comfort of the parents who had now essentially completed their major parental task. I knew that this could cause trouble between the parents, but it was a risk I felt I had to take.

The fry were transferred to a 2ft. tank and feeding was commenced with Tetramin E. They appeared to respond to this food quite well, but after a further few days only thirty of the hundred or so fry which were originally put into the tank were still alive and these are surviving to date. Whether I had used the Tetramin too early or whether it was wastage due to a change of conditions that caused the deaths, is a matter for speculation. The young fish are now over six weeks old and are doing well and are being fed on Vit-a-min. This transfer to Vit-a-min was made after approximately a month, and the fish cope very well with this small size of flake food.

The removal of fish from the community tank did have an effect on the parent fish, and it was an effect I had hoped would not happen, but I knew that the possibility existed. The parents began to distrust each other—apparently blaming each other for the loss of fry, and there appeared some definite agitation in their manner. Three weeks later the fish spawned again, but this time the male took overall charge after fertilisation, and would not let the female anyway near the site. The male would make odd dashes for food and then return to the eggs and again ward off intruders, including the female cichlid. Other than this the procedure was identical to the first. (I had decided not to remove the male and the pregnant female to the tank containing the fry from the previous spawning,



because I felt that the parents would kill them. As a result the fish spawned again in the community tank.)

I syphoned off the fry (as before) when the male had difficulty in keeping them safe, but after a day in the tank with the young fry, they had all died. The question now was, did they die due to water condition or were they killed by the young fry from the previous spawn?

This latest transfer finally made matters worse between the parents. A few days later the female had a couple of nasty bites taken out of her tail. I can only assume that because of the quarrelling which occurred between the two fish, the male had been responsible for the bites.

Male fish with fry.

A few weeks later when I was away from home the female spawned again. The ceremony was watched by my wife. This time the female took charge and would not let the male anywhere near the site, not even apparently for fertilisation. After two days the embryo "dots" could not be seen, but the eggs were still moved by the female cichlid to a different place. A day later the female was actually spotted eating the eggs. The whole batch of eggs had been completely infertile.

So ends the story up to the present date. I have approximately 30 fish which remain out of three spawnings—not a very high success rate. If I had had more time to spend on the fish, and more equipment, then I feel certain my success rate would have been higher.

As for the parent fish, they now appear at least friendly, but both have been overcome by drastic shyness, especially the male; he spends a great deal of time hidden behind a rock. There are no further signs of spawning at the moment, but I am optimistic that they may breed again.

I hope I have given some reasonable account of my experience and observations of this fish, but I would further hope that anyone owning this fish will not take all my findings as completely accurate, but will compare and criticise my information. It may be that if the fish becomes popular, then the next aquarium text published may well carry a more thorough description of this rather charming species.

CARP FARMING

by Witold Zaczeniuk

FOR SOME TIME now I have been asked by my fellow friends from the British Koi Keepers Society, to write not only about my practical experience with Koi, but also to pass on some relevant theoretical information which I have gathered after reading a few books published in Poland, on the subject of carp-farming.

However, I do feel that my painful, and indeed very costly, practical knowledge of Koi, over the last four years, has given me some experience, although no doubt of a confused nature. One should be careful not to misguide others, especially in a case when the loss of expensive fish cannot be compensated by just signing a cheque for replacements, or by just saying "Oh well, one must pay for mistakes".

Bearing this in mind I can frankly say that the information relating to carp (*Cyprinus carpio L.*) that I am willing to share with the readers is based not only on my experience, but also as a result of my visit to a carp farm, and subsequent reading of a most reliable university text book on the subject of carp. Personally, I also believe that *Nishiki Koi*, or Japanese Coloured Carp as it is sometimes called, is the same thing and only the colour variations make them different from the common carp.

In the second half of April this year, during my visit to Poland, I managed, with the help of friends, to get very close to the real thing, *i.e.*, to a proper and highly efficient carp farm which was only known to me from the books presented to me by my friends. Luck was also on my side in two ways. First, the farm which I was visiting is a carp farm which deals mainly in breeding fish up to one-year-old for further distribution to other carp producing farms. Secondly, my arrival in the third week of April gave me a chance to see for myself the preparations carried out at the farm at the start of the breeding season which is, in my opinion, most interesting to every Koi keeper. The opportunity to have a talk and put questions to highly experienced and educated persons in charge of the farm, was also available.

Carp breeding

Work on the carp farm usually starts at the end of March or the beginning of April, when the snow and ice disappear, and water temperatures reach 8° to 10° centigrade. Three small ponds about 50 to 100 sq. yards are used. Female carp between five and eight years of age are brought to one pond, while males between four and eight years of age are taken to another. The third pond, called the spawning pond, is left empty until the beginning of May when the water temperature rises to about 16° centigrade. The pond is then filled up with water. When the water temperature in the spawning pond reaches 17° to 18° centigrade, selected carp for spawning are brought into the pond. One set of spawners is always used, *i.e.*, one female and two males. The spawning pond is then screened with mat fencing up to three yards in height, in order to give the carp privacy, and to protect the pond from winds and intrusion. Care must be taken that from now on the water level in the spawning pond remains constant. Any slight variation, even ½ in. could affect or delay spawning.

Carp usually spawn in a few days time, but when noticeable delay in their characteristic chase before spawning occurs, then some of the fish in the spawning pond are quickly replaced by fresh spawners. Fish usually start spawning soon after midnight, and sometimes go on spawning until well into the after-

noon. After the eggs have been laid the spawners are swiftly and gently removed from the spawning pond and the level of the water is increased by about 12 in. This is done mainly in order to protect the eggs from severe fluctuations in temperature during the night and also in case of an unexpected freeze. A rapid drop of water temperature of 2° to 4° centigrade can cause the destruction of at least 20 per cent of the freshly laid eggs.

Carp belong to the family of fish which can lay eggs in stages. After the first spawning they usually lay eggs again in 7 to 10 days time. The eggs of a carp are about 1·5 to 2 mm. in diameter. They have two membranes. First the outer one which contains many channels through which the sperm get into the egg. Fish eggs in contact with water swell rapidly, and the are only two minutes for the sperm to reach the inner membrane in order to fertilize the egg. The amount of milt sprayed on the newly-laid eggs determines the amount of fertile eggs. This is the reason why every carp farmer as a rule uses two or three males for each female. The fertile eggs are usually hatched after three to eight days, but not longer than ten days. Hatched fry, as soon as they start feeding, are carefully removed to another pond, or ponds, for intensive breeding.

It must be pointed out that there is a close relation between the temperatures at which carp spawn and the growth of plankton in the pond. It has been found that plankton starts to grow at 16° centigrade and the intensity of growth is between 18° and 23° centigrade. Plankton is the first food which young carp feed on.

Carp feeding and their growth

Recent tests carried out by the carp industry show that carp feeding is most extensive at water temperatures of 23° to 28° centigrade. In this temperature a one-year-old carp can consume as much as 20 per cent of its own weight in twenty-four hours. A two-year-old carp in the same conditions uses 6 per cent to 9 per cent of its own weight in food. When the temperature falls rapidly, by 2° to 4° centigrade, carp stop eating for about two hours, until they get used to the new water conditions. On the other hand, when the water temperatures are gradually lowered, carp do take food all the time, but their digestive system does not function properly, and with temperatures below 10° centigrade (50° farenheit) food is not really used for body building, but only for sheer existence, and for this reason heavy feeding at these temperatures is regarded as a sheer waste of money. One exception to this rule, however, is the young carp of up to one year of age which can safely be fed at temperatures up to 6° centigrade. The type of food given to carp plays a very important role in their growth. The amount of animal food two vegetable food is 1 to 12. That is to say, for each 1 gramm of animal food carp need 12 grammes of vegetable food. The most beneficial vegetable food are those containing a large proportion of digestive proteins. Dry food is never given to carp unless it has been properly soaked in water beforehand. The water content of the food is a very important factor. Carp belong to a family of fish which do not have a stomach, and all digestion takes place in the intestines. Natural food which fish are able to find in the ponds, lakes, or rivers contains 67 per cent to 91 per cent water, and that content of water helps in the proper functioning of the digestive system. Dry food given in quantity, without soaking, is the main cause of inflammation of the intestines, thus making the fish susceptible to many diseases. It has been said by leading breeders that dropsy, which can occur in many forms, like swelling of the belly of the fish, and boils on the skin, always begins with dry food.

Mineral matters, like phosphur and calcium in a small percentage from 1 per cent to 2 per cent is essential for developing fish bones and fins. Vitamins in the food also play an important part in the growth of the fish, e.g., vitamins A and B2. Food like grain, especially barley, contains these vitamins. Vitamin D, which is found in the green parts of a plant, prevents malformation of the spine. Vitamin E, which is found in the seeds and the green parts of a plant is very important in the formation of milt and roe for older fish. The main foods given to carp are really vegetable foods.

Over feeding of fish has an adverse effect on their reaching maturity, therefore it can be said that under-nourished carp, but not starved, will reach maturity much quicker, and be a better choice in selecting for spawning. Male carp reach their maturity in three years, and females in four years time.

In the first two years both sexes have the same ratio of growth, and therefore it is impossible to distinguish male from female, especially in the *Doitsu Koi* type. In the three years when the males retard their growth it can be assumed that the others which still make progress in growth are females. Of course this can only be said if the breeding of carp is carried out in large ponds, and in reasonably good breeding conditions. It has been found that young fry which have been in a large pond reach a weight of 139·5 grammes when its brothers or sisters kept in an aquarium reach something like 0·3 grammes in weight for the corresponding period.

Young carp, before they reach 2½ to 3 ins. in length, grow both ways, in length and in width. After that their growth takes place mainly in width, and to a lesser extent in length, until they reach maturity. From that moment the main growth is in length.

THE SMALL-LEAVED AMAZON SWORD PLANT

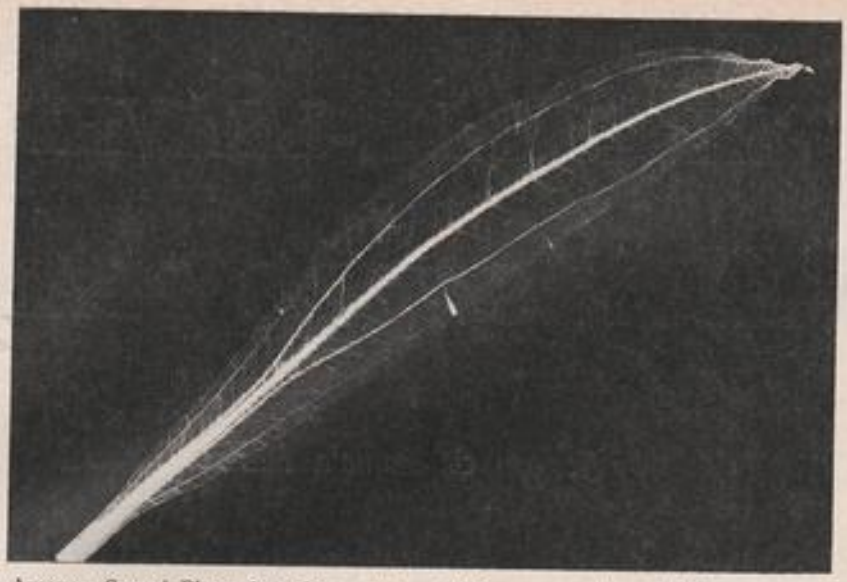
by Jorgan & Pamela Hansen

THE Small-leaved Amazon Sword Plant, *Echinodorus brevipedicellatus*, is an old and well-known aquarium plant. It was described as early as 1898 by Kuntze as *Sagittaria brevipedicellata* but was moved to the *Echinodorus* genus by Buchenau in 1903. It gets its English name from the fact that there are other *Echinodorus* species with larger and broader leaves, and from its origin in the Amazon in Brazil. The latin name "*brevipedicellatus*" refers to the plant's short-leaf-stalk.

This is one of the really large plants for large tanks and the larger the tank the greater the plant will be shown to advantage. It is one of the standard plants in angel and discus tanks, as both these fishes like to spawn upon its leaves. Moreover, the plant develops a strong net of roots and can thus be used in most cichlid tanks even when the cichlids in question are generally regarded as plant-uprooters. If necessary small stones can be placed in a circle around the plant to help protect the roots from being dug up. It should not be planted in tanks with a water height of under 30 cm (12 ins.), in fact preferably not under 40 cm (16 ins.), as the leaves would then eventually lie along the surface of the water so that only the leaf-stalks would be visable.

This is a perennial plant with a short rounded rhizome from which the leaf-stalks extend in a rosette. The leaf-stalks grow to a length of from 5-18 cm (2-7 ins.) and are triangular in cross-section. In old plants, the stalk is quite sturdy, with a thickness of about 1 cm (½ in.). The leaves attain a length of from 25-55 cm (10- 22 ins.) and a width of 2-7 cm (¾-2¾ ins.). The longest leaf from any of our specimens measures 30 cm (12 ins.) in length and 7 cm (2¾ ins.) in breadth, with a leaf-stalk length of 17 cm (7 ins.). The leaves are light-green, lancet-formed, and possess five veins, as shown in Figure 1.

E. brevipedicellatus is often confused with *E. panicu-*



latos, the large Amazon Sword Plant, but these can easily be distinguished from the veins alone, as in *E. paniculatus* the veins all start from the beginning of the leaf where the leaf-stalk ends, as shown in Figure 2, whereas in *brevipedicellatus* the inner pair of veins begin further up the leaf (Fig 1) . In *E. magdalenensis* the Dwarf sword plant, the veins begin at the base of the leaf as in *paniculatus*, but there are five veins in the latter plant as opposed to three in *magdalenensis*. Young *brevipedicellatus* and *magdalenensis* plants can thus easily be distinguished from one another both by these characteristics and by the fact that the leaves of *magdalenensis* are stiffer and a darker green colour. The leaves of *paniculatus* are a lighter green colour than those of *magdalenensis*.

Under favourable conditions, which means a temperature of from 22°-25°C (72°-77°F), much light, and a bottom layer of rough gravel, the plant grows very quickly and regularly produces shoots. The DH and pH values seem to be irrelevant. If the plant grows in a marsh it will develop smaller leaves with a glossier surface.

It is not difficult to grow. Long flexible segmented stems are regularly produced, from which shoots develop at the nodes. The distance from the base to the first node we measured to be 25 cm (10 ins.), with the following segments measuring from 10-15 cm (4-6 ins.). If the end of the stem is hindered from developing due, for example, to inadequate light, a new stem will then develop from one of the other segments In this way we have had up to four secondary stems. Two primary stems on the same plant also occur now and then. Later roots develop from the shoots and one should then weigh the shoots down to the bottom with a few small stones. In a week's time when most of the young plants will have attached themselves to the gravel, the stem can be severed from the mother plant.

With our *brevipedicellatus* plants the record number of shoots on one stem is 48. The number from each node varies from one to three; and as opposed to the case in *E. magdalenensis*, shoots develop from each node. When the young plants are about 10 cm (4 ins.) high. they can be planted out in a tank with a water height of 20-30 cm (88-12 ins.), and will grow quickly. After a year's time they themselves begin to produce shoots. If one continually nips off withered leaves the rate of growth increases.

Division of the rhizome also occurs: when the new plant has five or six leaves it is time to separate it carefully from the mother plant. The roots are often considerably entangled together.

If the plant gets enough light it might flower. A flower stalk about 1 metre (40 ins.) long shoots up above the water level, and small white flowers develop.

Altogether there are 30 species of *Echinodorus*, and *E. brevipedicellatus*, The Small-leaved Amazon Sword Plant, is one of the 26 American species, along with two species from Europe, one from Africa and one from Asia.

CORRECTION

Mr. Jack Hems would like it known that he was not responsible for the erroneous information given on the catfish *Hypostomus plescostomus* in our issue for May, 1973. *Hypostomus* is the valid generic name for the species once known to science as *Plecostomus plecostomus*. We apologise for this mistake.

FISHES OF THE RED SEA

by R. D. Sankey

THE RED SEA as an environment is quite different from any other coral sea. It is generally understood that this is due to its natural isolation from both the Mediterranean and, in part, from the Indian Ocean. However, it should be generally considered as an exaggerated bay formed within the Indian Ocean. It offers a different habitat and an equally different fauna.

For example, the average water temperature appears to be much higher, overall, than comparative waters of the Pacific Ocean; in fact 10° to 20°F. higher. The salinity, too, is much greater and the density rarely drops below 1·030 and often exceeds 1·036, whereas the waters of the Indo-Pacific border are often found to be a lot less than 1·022 and rarely more than 1·024. Obviously much of this is due to the amount of fresh water emptying into the sea from its surrounding land. Of course, in the Red Sea most of the surrounding land is total desert, with virtually no fresh water rivers running into it. The tides, too, are very small, perhaps only 1 to 3 ft., compared with the East African coast where tides generally exceed 10 ft.

I have visited and dived at Massawa, in Ethiopia, on the south-west side, and at Jeddah, in Saudi Arabia, on the central eastern side. The coral reef structures of each place are very different and many fishes that are found in the south are not found in the north and, of course, the reverse applies. It is generally thought to be because of the deep water that isolates the east from the west and, perhaps, the Massawa trench divorces the north from the south to a lesser degree. Just out from Massawa is a group of islands called the Dahlaks which have gently connecting coral reefs which offer a perfect environment for such beautiful fish as *Chaetodon semilarvatus*. Whilst in Jeddah the coral reefs are made up from a series of classical fringing reefs that meet on the surface and then drop with a sheer face where *Anthias squamipinnis* and *Pygoplites diacanthus* are common. In the far north, in the Gulf of Aqaba, such fishes as *Pseudochromis fridmanni* and *Chaetodon paucifasciatus* are particularly common but these two fishes appear to be totally unseen in the greater Massawa area. In the far south, almost at the mouth of the Red Sea, there is an isolated volcanic island that is situated in many thousands of feet of water; this island harbours both fishes from the Red Sea and fishes from the Gulf of Aden in particular *Chaetodon melapterus* which, in my opinion, is the world's most beautiful butterfly fish; it has a body of brilliant orange with dorsal, anal and caudal fins primarily jet black. Here, too, one can find *Coris formosa* and *Coris africana*. Throughout the Red Sea one can find *Larabica quadralineatus* (four-line Neon wrasse) which is an endemic wrasse related to the Cleaner wrasses. The dominant surgeon fish is *Acanthurus sohal*; the scientific name has been derived

from a local Arabic name, and it is often referred to in many books as *A. bleekeri*. This beautiful surgeon fish lives mainly on the crown of the reef where the water is quite turbid and where it grazes on the *algae*.

Many of the fishes within the Red Sea have very similar counterparts in the Indian Ocean. This, obviously, is due to the isolation of the environment through natural evolution. With the butterfly fishes there are notably three examples:—

Red Sea fishes		**Indian Ocean fishes**
C. fasciatus	—	*C. lunula*

C. paucifasciatus — *C. chrysurus*
C. austriacus — *C. trifasciatus*

although in the latter case *C. austriacus* can be considered as a transitional stage between *C. melapturus* and *C. trifasciatus* in both colour-pattern and physical characteristics.

The only clown fish (anemone fish) present is *Amphiprion bicinctus*, which is said by Dr. Gerald Allen to be closely related to *Amphiprion allardi* of East Africa. They are generally found in anemones of the *Discasoma* type, although I have seen colonies of them in *Radianthus ritteri*. The other main anemone symbient is *Dascyllus trimaculatus* (Domino damsel) which appears to be unable to compete with *D. aruanus* and *D. marginatus* in living in colonies on the inner reef, as it does elsewhere in the world. I have many times observed *D. trimaculatus* spawning at the base of an anemone in the same way that Amphiprions (clown fish) generally do.

RED SEA FISH

Pomacanthidae
Pomacanthus asfur
P. imperator
P. maculosus
Pygoplites diacanthus
Centropyge multispinnis
Geniacanthus caudovittatus?

Chaetodontidae
Chaetodon melanotus
C. semilarvatus
C. larvatus
C. fasciatus
C. lineolatus
C. melapterus
C. austriacus
C. paucifasciatus
C. mesoleucus
C. auriga
C. trifascialis
syn. *Megaprotodon strigangulus*
Heniochus intermedius
H. acuminatus
Forcipiger longirostris

Labridae
Pseudocheilinus hexataenius
Thalassoma fuscus
T. lunare
Larabica quadralineatus
Gomphosus varius
Coris angulata
C. africana
C. formosa
Lepidaplois axillaris
L. anthiodes
Anampses coerulopunctatus
A. melagrides
Halchores centroquadrus
Stethojulis albovittatus
Novaculichthys taeniurius
Hemigymnus fasciatus
H. melapterus

Acanthuridae
Acanthurus sohal
A. garm
Zebrasoma xanthurum
Z. veliferum
Ctenochaetus strigosus
Naso literatus
N. unicornis

Pomacentridae
Amphiprion bicinctus
Dascyllus aruanus
D. trimaculatus
D. marginatus
Pomecentrus annulatus
Chromis coeruleus
C. dimidiatus
Abudefduf lacrymatus
A. leucozona
A. sordidus
A. xanthurus
A. saxatalis
A. flavatalis
A. sulphurus

Balistidae
Rhinecanthus assasi
Balistes undulatus
Balistoides niger
Odonus niger
Pseudobalistes fuscus
Oxymonacanthus longirostris
Monocanthus tomentosus
Hemibalistes chrysopterus

Miscellaneous
Anthias squamipinnis
Ostracion cyanurus
O. cubicus
Diadon hystrix
Bolbometapon bicolor
Myripristes sp.

Holocentrus diadema
Macolor niger
Gobiodon citrinus
Pogonaculius zebra
Pterois volitans
P. radiata
Arothron hispidus
A. aerostaticus
Canthigaster margaritatus
Cephalopholis miniatus
C. argus
C. tauverna
Pseudochromis fridmanni
Ps. flavavertex

This list of fishes has been accumulated by myself, showing the species that I have either collected or seen. Of course, it is a very incomplete list, showing only those fishes that are of general interest to the Marine Aquarist. I am sure that as time goes on the number of fishes on this list will be greatly increased.

PRODUCT REVIEW

Owarafu Fish Food, made in Japan, and distributed by T.F.H. (Great Britain) Ltd., 13 Nutley Lane, Reigate, Surrey, RH2 9HR, price per pack 30p plus V.A.T.

On page vi of the May edition I read the T.F.H. advertisement which stated: "Owarafu is coming!" I was intrigued. The advertisement also stated: "It grows—it's cellophane wrapped—and you will have to wait until June or July at least before you can buy it." Fortunately for me, I only had to wait until the middle of May before I received a sample of the new food for review purposes. When the sample pack did reach me I must say I was glad that a brief letter accompanied it, otherwise I doubt if I would have guessed what it was.

This new food is made from wheat gluten—the protein in wheat flour. The pack of food consists of three "bars" of food which look rather like pieces of balsa wood—for want of a better description. Each "bar" is about 5 in. × ⅛ in. × ½ in., and is "marked off" into about seventeen sections. The cellophane wrapped pack also contained a small leaflet with some Japanese writing on it—but unfortunately I am unable to read Japanese. However, the letter which I received with the sample stated that the food should be fed as follows: "Break off a small segment and drop into the aquarium. It will rapidly expand, and floats where fishes will soon congregate to feed. With larger tropicals, marines or pool fish it is advisable to pre-soak before feeding."

I placed a few segments of food into water to observe the results. After a fairly short time the food had absorbed water and expanded from a fairly hard "block" into a white mass which visually resembled plastic foam—or soaked bread. I tried soaked and "dry" samples with a variety of tropical and coldwater fishes; I found that Owarafu was most popular with my ordinary goldfish; however, much more extended testing would be required to draw any valid conclusions about this original new food.

I feel that I would like to know more about the contents of the food, and its percentage analysis; but these facts may be available when the food is on sale. I do not yet know at the time of writing.

Rena 101 Aquarium Pump, distributed by Impelec Ltd., 89-89a Park Street, Slough, Bucks., £1·80 recommended retail price plus tax.

Readers of my previous reviews of Rena air pumps will possibly know of my high opinion of them; the new Rena 101 pump follows in the tradition of its predecessors! The 101 is a compact little pump with a grey plastic casing. Its size is about 4 in. × 2 in. × 2 in., complete with grey plastic base. The base is firmly attached to the body by four screws; it has three small rubber feet, a felt air filter pad, and a "tab" at one end by which it may be suspended if desired. The pump which I received for testing was fitted with about 28 in. of electrical lead. (Another couple of feet of lead would have been useful.)

The solid construction of the exterior of the pump is matched by the compact arrangement of the interior components. Situated on the side of the exterior of the pump, beside the air outlet, is an efficient air control screw—a useful feature.

I found that the pump, in operation, gave a good air output. As I have said before, subjective evaluations of air output are not very scientific, but are useful. I was able to very comfortably operate three small, outside filters—which work on the simple air-lift principle—with this pump, and I was very pleased with the quietness of the Rena 101 in operation. An advertisement for the Rena 101 gives the following as its main "attractions": "improved design case; improved design base; improved coil mounting; improved lead assembly; built to every electrical standard in the world; and fully guaranteed for one year," with "spare parts in stock *always*."

If you require a smaller air pump, I suggest that you invest in a Rena 101. Its pleasing appearance is matched by its performance. I would certainly recommend this little pump—particularly to those who may require an air pump operating in, say, a living-room!

B. WHITESIDE.

OUR EXPERTS' ANSWERS TO YOUR QUERIES

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

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

TROPICAL QUERIES

by Jack Hems

I should appreciate any information you can give me regarding the requirements, country of origin and maximum size of the swamp barb?

The swamp barb or *Barbus chola* is native to India and Burma and flourishes well at the regular range of temperature for a tropical tank. It attains a length of about 4 in. and eats any food normally given to a non-faddy fish.

Could you give me details about the water, size of tank, plants, food and temperature for keeping and breeding the angel fish (*Pterophyllum scalare*) **and its several varieties?**

The best advice I can give you is to obtain a copy of our publication called *Angel Fish—King of the Aquarium*. This informative booklet will be sent to you, post paid, for 28p.

I am changing over to Fluorescent lighting. What wattage do you recommend for a 30½ in. × 15 in. × 12 in. tank?

I suggest you buy a 30-watt warm white or Gro-Lux type lamp and keep this switched on for at least ten hours a day.

Please could you give me some information on a fish my dealer has for sale. It is called a fire eel and is about a foot in length?

The fire eel is a freshwater species from south-east Asia. It is known to science as *Mastacembelus erythrotaenia* and reaches a length of 18 in. and more. It thrives best in a spacious tank by itself or with its own kind and requires live food such as worms and tiny live fish.

How do I set about breeding bloodworms?

You cannot breed bloodworms like you can breed whiteworms, say, or *Daphnia*. All you can do is to place water-filled receptacles outdoors to encourage the midge called *Chironomus plumosus* to use them as repositories for eggs. In due course, the eggs develop into the *larvae* popularly known as bloodworms. The food of bloodworms is found in decaying vegetation and mud.

How can I remove the green fuzz that is choking the inside of my filter?

Pour household bleach inside the tube and shake it around. Then leave the tube to soak for a while before rinsing it out with plenty of clean water.

Could I keep a community of jewel cichlids, oscars and Jack Dempseys in a four-foot tank?

The short answer is no. All the species mentioned above are quarrelsome and do not mix.

I recently bought a pair of kribensis and they appear to be in breeding condition. My worry, however, is that the male is much larger than the female. Will this difference in size go against a successful spawning?

A characteristic feature of this fish is the larger size of the male. Provided the aquarium is well-furnished with plants and a flower pot or two there should be little, if anything, to worry about.

I wish to start a tropical aquarium in a 24 in. × 12 in. × 12 in. tank. Please tell me the number of fish I can keep and give me the names of suitable species.

Your tank will support about seventeen small tropicals without fear of overcrowding. I recommend a mixture of neon tetras, black neon tetras, pristella, guppies and Schubert's barbs.

I should like to know the names of some exotic fishes suitable for keeping in an unheated tank maintained at normal living room temperature.

Among the species best suited for a temperature range in the sixties (°F) are: White Cloud Mountain minnow, the common paradise fish (*Macropodus opercularis*), the golden form of the Japanese rice fish (*Oryzias latipes*), the black-banded sunfish (*Mesogmistius chaetodon*), the pumpkinseed sunfish (*Lepomis gibbosus*), the peppered catfish (*Corydoras paleatus*) and the Japanese weatherfish (*Misgurnus anguillicaudatus*).

I bought two fish which my dealer assured me were rainbow fish. But checking rainbow fish in a book, I discovered that mine were not like the ones described and illustrated at all. The fish in my aquarium do have two dorsal fins but instead of lines of red dots on the sides they have a black stripe and a yellow tail fin with dark edges. Could you identify the species for me from this rather vague description?

I think the fish you have is *Bedotia geayi*, popularly known as the Madagascar rainbow fish.

I would be grateful for any information you can give me on a fish called the pearl cichlid.

The pearl cichlid is known to science as *Geophagus brasiliensis*. It is native to eastern Brazil and attains a length of about 10 in. It is an aggressive fish and is difficult to sex except during the breeding season when the male develops brighter colours. Old males, however, do show a distinct hump behind the head.

My American flag fish have spawned. I removed the female to another tank but have left the male with the eggs. When should I separate the male from the fry?

It is safest to separate the male from his offspring at the earliest opportunity but sometimes a male will make a devoted parent and make no attempt to molest the fry. In this respect the American flag fish resembles some cichlids.

Please tell me how to keep the leaf fish?

The leaf fish (*Monocirrhus polyacanthus*) should not be placed with fishes much smaller than itself, for it has a mouth which can be opened very widely. Next, give it old and slightly acid to acid water and soften the light with plenty of foliage at the surface. A temperature in the upper seventies (°F) should be maintained. Food should be living like baby guppies, whiteworms, *Daphnia*, gnat *larvae* and freshwater shrimps.

COLDWATER QUERIES

by Arthur Boarder

I would like to raise a few fry but my fish are too young to breed. Where could I get some eggs?

It is unusual for goldfish eggs to be offered for sale. It would be rather a hit or miss transaction as the eggs might not be fertile; there could be hundreds on a bunch of weed or just a few. You say your fish are too young to breed. I have had fantails breed when only eight months old and so perhaps yours may yet do so this season. Feed with plenty of garden worms and see that the water is well oxygenated.

I have had an Oranda and goldfish suffering from fin-rot. I have tried advertised cures but the fish do not appear to be much better. What do you suggest?

I am sure that fin-rot can be encouraged by bad conditions in the tank. If a goldfish is in good health it has a good covering of mucus. This acts as a protective against such diseases as Fungus and fin-rot. One of the first tasks for the fishkeeper when the fish become ill is to make sure that the conditions in the tank are correct. Unless the water is free from foul gases and harmful minerals and is well charged with oxygen, there is little hope of curing a fish suffering from one of these complaints. Usually the salt treatment is sufficient to cure a fish unless it has become so weakened by the disease and is too far gone to enable one to save it. Most fishes will recover from these diseases if the trouble can be caught in time. The salt treatment must be properly carried out. Use a shallow bowl or container, as the more shallow the water the more oxygen is it likely to contain, because more of it will be in contact with the atmosphere. Place the fish in the water and add a tablespoon of sea salt (Tidmans will do), to a gallon of water. Do not stir the salt in but let it dissolve gradually. Keep the fish in for three days and if no signs of improvement, make a fresh solution half as strong again. Do not use the same solution and add more salt. After the fish is cured, reduce the strength of the solution by adding fresh water or by making a new mixture.

I have fourteen golden orfe in my pond, some nine inches long. I used to see them swimming about but lately they have kept in a group at the bottom of the pond. Why is this please?

It is difficult to say why the Orfe keep to the bottom. These fish usually swim about very actively near the

surface of the pond. It may be the weather which is not to their liking. It does not appear that the water is impure or the fish would be at the surface mouthing for air. I suggest that you keep your waterfall running more often and try to encourage the fish to rise to the surface by giving live foods which can float on the top of the water. Bluebottles are a good food or even wasps will do if obtainable; also try some broken maggots and keep well back from the pond after offering food.

I have two goldfish, one 18 years old and one 16. One has become very sluggish and lies on its side on the bottom of the tank. It is very listless and parts of it have turned black. The condition of the other fish is deteriorating and appears to be going the same way as the other. What can I do?

Your goldfish are a good age and although I do not suggest that goldfish cannot live for some years longer than yours have, it is a fact that the time they can live depends a great deal on the way they have been kept all their lives. If a goldfish had been kept under ideal conditions it could live twice as long as one which had had to rough it in poor surroundings. By the sound of the condition of your fish I doubt very much whether there is anything you can do to improve their state of health. Try to warm the water up to 65-70°F, and feed only with live foods. If the fish are not too far gone they might respond to a mild solution of sea salt for a few days, about a dessert-spoon to a gallon of water.

I have made a pond in my garden and intend to keep Mirror Carp. What other fishes could I keep with them please?

Providing you have the space there are several kinds of fishes which will be all right with the Mirror Carp. You can have goldfish of any of the hardier varieties, Tench, both green and golden; Rudd, ordinary or golden; any other species of Carp and golden orfe. Do not however try to keep too many kinds of fish in your pond as it is not over large and you will find much more trouble to keep a large number of fishes healthy than if your pond was under-stocked rather than over-stocked.

I have an Oranda about an inch and a half long. I have a tank 18 by 10 by 10 in. Is this big enough? I have read that they need 60-65°F. is this correct?

It is probable that your Oranda has been kept at this temperature and so it would be wise to keep it at this level. Actually, Orandas have been bred from the original goldfish which can be stated as hardy. However, most of this type of fancy goldfish are bred under almost tropical conditions and it would be unwise to put the fish in colder water than it has been used to. When such fancy goldfish are purchased it is always wise to ask the dealer at what temperature they have been kept. Incidentally, even if bred under warm conditions it is always possible to gradually reduce the temperature of the water and a tank in a living room should be quite safe for the Oranda without artificial heating once it has been subjected to a gradual decrease in water temperature. Your tank is large enough for your fish for three years at least.

I have a swimming pool 18 × 8 ft. which I have converted to a fish pond. I have a number of fish which include some golden orfe. I now find that some of the orfe have small black patches on them. What can I do about this?

There is nothing you can do to prevent the orfe from getting these black patches. Many orfe develop them, especially on their backs and one very often sees fine specimens at shows which are marred by the same marks. Some strains appear to be more prone to this happening than others and I know of nothing which will clear the fish again. Unfortunately the black seems to increase on some fish as they get older, whilst others may never have any at all.

Discus Data Desired

We are currently engaged on a research project at the local polytechnic, where we are both chemistry students, investigating the mode of feeding and the nature of the food of young *Symphosodon discus*. The age of the discus, under observation, being 0 to 50 days.

We enjoy our fish keeping but the lack of solid, well documented information about this fish annoys us more than the general care and maintenance of fish in some public places. Our aims in this project are as follows:

1. To keep a number of discus (approximately two to three pairs) to observe their general behaviour in an environment as close to that of normal habitat as possible.
2. To induce at least one pair to breed so we can observe the behaviour of parents with young.
3. To observe the way, time and position, in which the young feed.
4. To analyse the food of young discus both chemically and biologically so that a substitute may be prepared.

To help us, we would be extremely grateful, should anybody keeping these wonderful fish tell us about their fish. In particular we would like to know what they eat and when, the tank and its fittings and *your* general method of maintenance.

With information from many fish-keepers/breeders, we may with luck, go some way to filling the information gap. So, please send us the information we have asked for.

Yours in anticipation,
D. Troster and
C. D. Beckett,
4 Grasdene Road,
London, SE18 2AT.

Discus Record?

My wife and I have been keeping and breeding Discus during the past eighteen months, and have in that time been successful in rearing more than a thousand of the fish.

What we think may be a record for the United Kingdom is the following achievement:

On 18th May this year, between 2 p.m. and 4 p.m., one of our pairs of Discus spawned; between the hours 6 p.m. and 8 p.m. the same day, a second pair spawned, and between 3 p.m. and 5 p.m. the following day, the third pair spawned (three spawnings in 26 hours).

In due course the eggs hatched and we have now about 300 young Discus happily swimming with their respective parents.

I will be pleased if, through the medium of your magazine, you would establish whether or not this is actually a record for the U.K.

J. Dernie,
Moscar Gables,
89 Sparken Hill,
Worksop, Notts.

Discus and White Worms

Please allow me to apologise to Mr. R. H. Cooke, publicly, for causing him distress of mind by my letter of January regarding Discus. I have written to him privately as I was most concerned that anyone should think that I could be guilty of lack of consideration, much less cruelty, for any of my pets.

My letter, written with my tongue in my cheek, certainly reads as though my Discus were given no option but to eat White Worms. I also offered them live *Daphnia* and Brine Shrimps, deep freeze ditto and every type of the best foods made, but I had not the heart to starve them into accepting food which they obviously disliked. I couldn't bring myself to be as cruel as that! Hence, they got their White Worms, but maybe one has to be cruel to be kind? Now they take the best Prawns from our deep freeze—scalded and shredded—every other feed.

Were I a chemist, I know I could benefit greatly from Mr. Cooke's previous articles, but they leave me feeling I must despair of ever breeding from my eight gorgeous large Discus and revert to—possibly—Silkworms!

Seriously, Mr. Cooke, I have bred and imported thousands of tropicals in a large tropical house I had in the 1930s with 75 tanks, and among over 1,000 tanks made and set up by my men were jobs for Cambridge University and the Cunard Line. It was just a spare time hobby!

Further, I'd like readers to see "cruel" me call my Blue and Gold Macaw from the treetops or house top, just for a game, and a herd of Fallow Deer dash out of the wood, across the paddock to me to be petted. When a five year old doe lay down tight at my side when I was half asleep under an oak, I was not ashamed of my tears. My list of various pets from reptiles to wallabies and horses would fill a column and earn me the title of "Animal Mad."

V. V. Pedlar,
Uplands,
Parbold, Lancs.

MARINE QUERIES

by Graham F. Cox

Would the following fishes be all right in a marine aquarium measuring 48 in. × 12 in. × 15 in.?

1 Domino Damsel (*D. trimaculatus*)
1 Electric Blue Damsel (*P. caeruleus*)
2 Common Clown fish (*A. percula*)
1 Fire Clownfish (*A. ephipprium*)
1 Regal Clownfish (*P. hepatus*)
1 Cleaner Wrasse (*L. dimidiatus*)

In order to secure a total absence of the twin toxins —ammonia (or ammonium ions) and nitrite ions, both of which are excreted by coral fishes, your aquarium should be filtered by a powerful undergravel filter. This should have two airlifts of *at least* ¾ in in diameter, preferably reaching to the surface of the water. When operated by a powerful airpump, each airlift will deliver 70 - 80 gallons of water per hour from beneath the gravel. Since the total gallonage of your tank is about 31 gallons, the final gallonage with allowance for gravel, coral, rocks, etc., will be of the order of 25 gallons.

In 1962 I coined the term of *turnover rate*, meaning, the number of minutes taken for all the water in an aquatic biosystem to pass through the biosystem's filtration equipment. In your case, we see that you have a pumping capacity of 2 × 75 gallon/hour = 150 gallons per hour. Yet the capacity of the biosystem is only 25 gallons. Thus all the water in the biosystem will pass through the filter $\frac{150}{25} = 6$ times every hour.

This gives a turnover rate of $\frac{60}{6} = 10$ *minutes*, which is ideal for an *unmatured* biosystem, which, of course, your tank will be initially.

Now let us return to the essence of your Question (1). Of all the fishes you have listed only the first two (*i.e.*, Damsel fishes) would be likely to survive the ammonia and nitrite content of your seawater for the 3—6 week period required for the bacteriological maturation of your filter "gravel".

Author's Note: I have used inverted commas for "gravel" above, because you may use coral sand, ⅛ in.—¼ in. silica gravel and crushed seashell (very much richer in vital phosphates than coral sand), or, ideally a mixture of all three media. In this case the *coarse crushed shell* would be placed first on the filter plate to a depth of 1 in. or so. Then a layer of ⅛ in. to ¼ in. *white silica gravel* would be put down to a depth of 1 in. also. Finally, as much *coral sand* as you can afford (minimum 1 in.) would be added as a top dressing. Note that the white silica and crushed shell should be well-washed in warm tapwater before use, but that the *coral sand*, which often retains some residual bacterial activity should not be washed at all. Additionally, in order to preserve this bacterial activity of the coral sand, it (the sand) should not be added to the filter bed *until* the synthetic sea salt has dissolved, aerated and filtered through the crushed shell and white silica for *at least* twenty-four (24) hours. *This is vitally important since the pH of all synthetic sea waters is dangerously low throughout the first day of its life*, and would effectually sterilize the coral sand.

Now the two Damsel fishes may be added to the tank. Care should be exercised to ensure that only *small* specimens are chosen, with the fish of the less dominant species (*P. caeruleus*) being appreciably larger than the Domino *D.* Feeding should be as critical as possible, the two Damsels receiving no more flake food *per day* than would thinly cover a one (New Pence) piece.

For the first five (5) days or so after adding the Damsel fishes no nitrite reading will show as the greatest proportion of fish excretion is ammonia. It takes five days for sufficient of the Nitrosomonas species bacteria to develop in the gravel to oxidise enough ammonia into nitrite. This produces a skin-pink discoloration on the nitrite test kit sample. *However, it must be remembered that from the first instant the two fishes are added to the aquarium,*

ammonia excretion and oxidation commences. Ammonia and nitrites produced by the bacterialogical oxidation of ammonia are both deadly toxins. They work against the fishes metabolism as systemic poisons, debilitate the fish and usually result in the fish succumbing to Oodinium disease. This reveals itself by causing a rapid increase in respiratory rate from the normal rate of 60—90 gill beats per minute (60—90 gb/min.) to a gill count often well in excess of 100 gb/min.

I first suggested in 1959 that a fish's respiratory rate (as measured by the number of movements of one gill-cover per minute, and assuming that all physical and chemical parameters within the aquarium are normal, *i.e.*, S.G. = 1·018—1·022 pH = 7·9—8·3, temp. ° = 75°F (24°C) etc.), is as good as guide to its general state of health as is the pulse rate of a mammal.

The beginner would profit greatly by learning to do a gill-beat count every time he feeds his fishes. Although this may seem a bore at first, after five or six attempts using a stop-watch, the ability to "ready-reckon" this tremendously important factor becomes almost a sub-conscious process.

Returning to the two Damsel fishes, we see that owing to ammonia—and nitrite-poisoning they have inevitably contracted Oodinium disease. In the normal course of events, exposed to 3-6 weeks of nitrogenous poisoning in this way the fishes would soon die. However, this tragedy is easily averted. Two medications, both approved by the Ministry of Agriculture and Fisheries and extensively used and recommended by veterinary surgeons, are available to marine aquarists and cure Oodiniasis, Marine Whitespot disease and Benedeniasis. For ethical reasons, I am denied the right to mention either of these products by name in this periodical, as my Company makes both products. One product is suitable for use in fish-only sea aquaria, the other for treatment of fishes in fish-invertebrate sea aquaria. I have sent you the names of both these products under separate cover. Although you don't mention that you are interested in invertebrates at this time, should you ever wish to keep invertebrates in your tank then it is better that you use the latter medication. Failure to use medication during this high-nitrite, high ammonia phase of your aquarium's life will almost assuredly result in the death of your two Damsel fishes.

With regard to the remainder of your Question (1), once your nitrite reading has fallen to zero, *i.e.*, *the test sample is totally colourless*, and remains so for seven days, then the remaining fishes on your list may be added, *EXCEPT THAT* even in a tank as large as yours, I would seriously counsel you against including *BOTH A. percula AND A. ephippium* in your collection. The Fire Clown (*A. ephippium*) would almost certainly kill the much less robust *A. percula* within a few days. (*See* PHYCHO-TERRITORIAL REQUIREMENTS below). If you must have one of these fishes without an anemone, I would suggest that *A. ephippium* is the more robust fish, and survives the absence of its protective anemone much better than the Common Clownfish. Also, at this time, I would gradually turn down the rather fierce t/o rate of the u/g filter until you have a t/o rate of 40-50 minutes.

Could I add any more fishes later?

By empirical means, I have arrived at the fact that the stocking of a sea aquarium should not exceed 1 in. of fish to two gallons of sea water *ONCE BACTERIOLOGICAL MATURATION OF THE FILTER SYSTEM HAS BEEN ACHIEVED, i.e.*, the nitrite reading shows zero. This stocking guideline takes into account not only the probable "*NITROFICATION POTENTIAL*" (my term for the ability of a filtration system to safely oxidize nitrogenous wastes such as ammonia, nitrites, urea, ureic acid, T.M.O., amino acids, etc.) of your filter, but also the *PSYCHO-TERRITORIAL* requirements (my phrase for the assumption the aquarist must make that each specimen in his sea aquarium has a definite need of a certain *minimum* guaranteed territory in order to ensure its normal mental health) of those species of coral fishes commonly kept in sea aquaria.

While dealing with this issue of the psycho-territorial requirements of coral fishes, please remember that every time you add a new fish to your tank you are disrupting the previously balanced allocation of territory. If the newly-introduced fish is to survive, then it must be capable of "carving out" a piece of territory for itself, before it is killed by the established fishes. This is why I have usually advised the beginner to purchase as many fishes at one go as he can afford.

Could you suggest an easy fish for a beginner which is yellow?

The following fishes are all yellow (or predominantly yellow). I have listed them in order of diminishing hardiness, although I would caution you that allowance must be made for individual variations within a species and for the condition in which you purchase the fish.

Dwarf Yellow Grouper (*Pseudo-chromis flavescens*)
Banana Wrasse (*Coris flavissimus*)
Yellow Longnosed Butterfly (*Lo vulpinus*)
Yellow Tang (*Zebrasoma flavescens*)

Of these the *Pseudo-chromis* has strong psycho-territorial (P/T) requirements, the next three fishes have modest p/t requirements and the Wrasse appears to have no strong p/t requirements at all. Most of the Wrasses (except notably the Cleaner Wrasse) manifest few p/t demands, except, of course, towards other members of their own species.

Junior Aquarist

THE HARDY EUROPEAN REPTILES AND AMPHIBIANS IN CAPTIVITY (Part 14)

by Andrew Allen

THIS ARTICLE considers the various European land tortoise available in this country. Dozens of books, some excellent and some mediocre, have been devoted to the subject of their care, and in a few short paragraphs I cannot hope to compete with these. So instead of trying to paint a comprehensive picture I have concentrated on areas where I feel that the available books are sometimes inadequate, and upon certain quite widespread fallacies.

29. The Marginated Tortoise (*Testudo marginata*)

Description.—This tortoise may grow up to 30cms in length. It can be distinguished by the absence of a spur on the tail or tubercles on the thigh, and above all by the flattened marginal plates at the rear end of the carapace. The carapace is yellow and black, the plastron is yellow with black triangular blotches.

Distribution.—Marginated tortoise may be found in Southern Greece, and also in parts of mainland Italy and Sardinia, where they probably occur as introductions.

This species is only rarely imported into England.

30. The Spur-thighed Tortoise (*Testudo g.graeca*)

Description.—T.graeca may grow up to 25cms in length. There is no spur on the tail, but there is a very large cone-shaped tubercle on the rear portion of the thigh, and it is from this that the species derives its common name. The carapace is often olive or yellow, the shields being edged in black. The plastron is yellow, often with a black area down the middle. Some specimens may be uniformly yellow or brown.

Distribution.—The type form is widespread in North-West Africa and Southern Spain (hence the alternative name Iberian tortoise).

A sub-species *T.g.ibera* is found on the North side of the Mediterranean in Southern Europe and Western Asia, including Iran, Syria, Mesopotamia, Asia Minor, the Caucasus, lower Danube and Eastern Balkans. The shields of its carapace are slightly broader and flatter, and it may be darker in colour.

Unfortunately the old literature on tortoise may be confusing because the scientific name *T.graeca* used to be given to

31. Hermanns Tortoise (*Testudo h.hermanni*)

Description.—This species may be distinguished from *T.g.graeca* by:

(a) its slightly smaller size, growing to lengths of about 20cms;
(b) the presence of a large horny spur on the tail, particularly in the male;
(c) the absence of a large tubercle or spur on the thigh of the forelimb; and
(d) the possession of a divided marginal above the tail.

Carapace colour may be yellow or brown, often with a central brown patch on each shield. In this, as in the preceding species, males may be distinguished from females by:

(a) the plastron—this is concave in males but flat in females;
(b) the tail—this is longer in the male;
(c) the marginal plate—this is curved in males but flat in females;
(d) behaviour—observation of a group of tortoise on a warm sunny day will soon clear up any lingering doubts.

Though the number of growth rings on the shields of the carapace is related to age, this relationship is not simple. Counting the rings will give an indication of age, but no direct measure.

Distribution.—The type is found in the Balkans, Italy and Sicily. A sub-species, *T.h.robertmertensi*, comes from Sardinia, the Balearics, Spain and the extreme South of France.

Breeding Habits.—In all three species the male courts the female by butting her from behind, biting her limbs, and mounting clumsily from the rear. The female subsequently digs a hole with her hind feet in soft soil, and there deposits between three and twelve large white spherical eggs. In warm conditions these should hatch in a little over three months.

Care in Captivity.—The following remarks apply to each of the three species already described.

The familiar tortoise is one of the most misunderstood and ill-treated of all household pets. Enormous numbers are imported each Spring, the vast majority of them destined to die within the year. The mass trade in tortoise is utterly and unequivocably to be condemned, both because of the cruelty that it causes to the animals themselves, and for its drastic effects on wild populations.

The new arrivals are doomed both because of the ignorance of their prospective, often well intentioned, owners and on account of the environment to which they are coming.

The tortoise is not a truly hardy animal. These species are imported exclusively from Southern Europe, Asia or Africa, lands where the climate is far different from our own. They favour dry scrub or desert habitats where the summer is long and hot, and the winter, though often extremely cold, is very rarely long. Contrast this with our own damp, cool summers and long, long winters and you will understand the effects that these can have on the health of a physiologically sensitive creature like the tortoise. If it were not for the fact that so many *are* imported I would hesitate to mention tortoise at all in a series dealing with hardy reptiles.

Naturally they cannot be housed indoors in the vivarium when adult, on account of their large size and notably active habits (tortoise are far from being the slouches that many people believe). Instead, the best home for them is a very sizeable greenhouse or conservatory. This should be sunny and well ventilated, with a small, shallow pool and dry soil and atmosphere. Under such conditions the tortoise should prosper mightily, in a climate and habitat that are ideal for their welfare. A centrally placed, brick-built hibernating chamber will give ample protection in the winter months.

It is unfortunate that few of us can afford to provide a perfect set-up such as this. We are forced instead to keep these animals outdoors in conditions that are far from desirable. The situation is not too bad in the Southern counties, where tortoise can do quite well if given proper care, and may live to a ripe old age. But in Northern climes it is downright cruel to keep these creatures outdoors unless the local climate is particularly favourable. This having been said, what are their prime requirements under the average conditions that they are likely to encounter in the English suburban garden?

To start with they must be confined. Tortoise are born wanderers and great escape artists, and it is not sufficient merely to release them in the garden and hope for the best. If you do so they will probably escape, and either get run over or perish at the onset of winter. A completely walled garden makes an admirable home—provided that you remember to block up the gap beneath the garden gate. In ordinary gardens a special enclosure must be built. This can have low walls of brick or of very heavy grade wire mesh (with all jagged points and edges carefully removed). The height of the walls should be not less than a foot, and they should extend an equal distance below ground as a defence against tortoise burrowing out, and rodents burrowing in. The enclosure should be the maximum possible size, for if the inhabitants feel too confined they will spend all their time trying to escape, and, knowing tortoise, they will probably succeed in the end. The landscape included within the enclosure must be both rugged and varied. It is totally unsatisfactory merely to wall off a section of the lawn. Tortoise enjoy exploration and will soon become bored in a featureless environment. There should be hills and rocks, hollows and shrubberies, with a wealth of vegetation. But there must be no abrupt cliffs and no deep ponds, for both could be the cause of nasty accidents. Tortoise are often confined by drilling a small hole through the rear of the carapace, threading a string through this, and tying the string to a pole, wall or brick. This method is to be avoided, for it is both unnecessary and dangerous.

Adequate summer shelter from the elements is also essential. This is best provided in the form of a stout waterproofed wooden box with sloping roof, packed with dry leaves or straw. It should be raised from the ground to protect against draughts, an opening must be cut in one face, access to this being via a gently sloping wooden board. The door should face towards the rising sun and be sheltered from prevailing winds.

In most of the articles of this series I have stressed that hardy reptiles and amphibians should be allowed to hibernate "naturally", i.e. choose their own hibernacula at their own chosen time. This is emphatically not the case with any of these tortoise. If left to their own devices they are unlikely to dig hibernating chambers that are sufficiently deep and warm to protect them against the worst ravages of our winters. This especially applies to clay soils. If they do survive they are likely to wake up during some warm spell in early January, walk about a little—and then get caught by a sudden frost. It is preferable to pack them away in a stout wooden box (their summer shelter is ideal) filled with dry leaves, straw and newspaper. This should then be placed in a

permanently cool, but frost-proof outhouse. The time at which hibernation commences will naturally vary with latitude, but will probably be in late October or early November. Though the tortoise should be well fed during late summer and autumn, they must not be allowed to hibernate on a full stomach, nor if their health is less than perfect. In the latter instance they must be brought indoors and coddled through the winter. When they awake in the spring they may need a drink, their eyes may need bathing, and until early June they should be replaced in the cool outhouse each night to protect against late frosts.

The keynote in feeding these animals must always be variety. Tortoise soon get bored with the same fare, and have very definite views upon what should be included in their diet sheet. Some of my specimens will not touch fresh fruit, others adore it; I have heard of individuals that enjoyed canned dog food or even sphagetti. Among the items that can be offered to these omnivorous creatures are lettuce, bean cabbage, pea, onion, buttercup and dandelion leaves, brown bread, a range of flowers (yellow seems to be a particularly favoured colour), earthworms, tender young peas, banana, orange, apple, grape (remove the pips!) and plum. Many other green leaves will also be enjoyed, but please avoid ivy or privet leaves and others that could be distasteful or even poisonous.

Those who take the trouble to provide these animals with a good, safe home will find the rewards enormous. Tortoise rapidly become very, very tame and are fascinating creatures with a wealth of interesting and diverting habits. Their popular reputation as slothful and dull animals could not be further from the truth.

The following article will consider the various European water tortoise and their treatment.

THE WATER SHREW

by D. Wareham

SHREWS are rather small, secretive, mouse-shaped mammals. They have tiny eyes, and ears which are almost hidden by their fine, shiny fur. All shrews are easily recognisable by their long and pointed snouts, a characteristic of the species. Three species occur in Britain—the common, the pygmy, and the water shrew. The common and the pygmy shrews are essentially inhabitants of hedgerows, woods, and rough grassland, and although both can swim well when necessary, they prefer on the whole, a drier habitat. The water shrew, however, is, as its name suggests, closely associated with water.

Found over most of the British Isles, with the exception of Ireland, the water shrew (*Neomys fodiens*) lives near stretches of still water and slow-moving streams. In certain parts of the country it is a frequent visitor to water-cress beds.

In general appearance, it is similar to a small mole. The upper parts are generally an inky black, but lighter specimens sometimes occur, these usually being a slate grey in colour. The undersides are white or grey, but again in certain specimens this can be so dark that the shrew appears uniform in colour. Occasionally, individuals have a white rim around the eye, and a white patch in the ear. The muzzle is thicker than that of the common shrew, and the tail slightly larger. A noticeable feature of the water shrew's tail is the distinguishing "keel", silver-grey in colour, which is made up of a double row of stiff hairs, and the purpose of which is to help the animal

as it swims. The large hind legs also have a fringe of hairs on them. The water shrew is the largest of the three British species, measuring some three to four inches from the tip of its snout to the base of its tail. The tail itself is another two to three inches in length.

Disused mole runs and mouse burrows are often used by the water shrew as living quarters, but it can dig well, and does excavate its own tunnels. A large nest is built, generally in a hole in the bank of a stream or beneath the roots of a tree, and constructed out of grass, leaves and moss. They breed twice a year and the litters vary in number from 4 to 9. The young are blind and naked at birth.

Although shrews are really insect eaters the water shrew has a rather varied diet. Worms and snails are probably eaten most frequently, but it also has a liking for molluscs and crustaceans, and small fish, amphibians and even baby rodents are preyed upon.

Active throughout the year, both during the day and at night, the water shrew spends much of its time in the search for food. It is an excellent swimmer and diver and has the ability to walk on the bottom.

It can remain submerged for quite long periods, now and again rising to the surface to take in more air. When in the water, the shrew takes on a silvery appearance. This is caused by numerous tiny air bubbles which stay trapped in the animal's velvet-like fur.

Unlike other members of the shrew family, the water shrew is more sociable in its habits, and often lives and hunts for food in numbers. Shrews produce a variety of noises, but the water shrew is perhaps the noisiest. It's shrill whistling and loud squeaking cries can frequently be heard along the banks of suitable streams and ponds even though the animal itself cannot be seen

THE CONSERVATION OF FISHES

by Robert T. Chambers

THE PUBLICATION, a year or so ago, of the Red Data Book, Volume 4, "Pisces" appears to have gone unnoticed in fishkeeping circles. This is a great pity because if aquarists themselves are not interested in the conservation of threatened species, one cannot expect the general public to have any concern. The Red Data Book is published by the International Union for Conservation of Nature and Natural Resources (I.U.C.N.) and is concerned with cataloguing rare and endangered species of animals. Volume 4 is exclusively concerned with fishes.

The I.U.C.N. was established under that name in 1956 but it is a rather older organisation than this implies. The origin was in 1934 in Brussels with the formation of the *Office International pour la Protection de la Nature*. This was later, under UNESCO patronage, evolved into the International Union for the Protection of Nature. Gradually, in the years following, increasing recognition by scientists of different disciplines enabled it to adopt its present title. Although an independent organisation, its membership includes sovereign states and major international scientific institutions. It is in fact a very illustrious body.

The Union carries out its work through six commissions of which one is the Survival Service Commission whose Freshwater Fish Group has been responsible for "Pisces". Other Commissions are for Education, National Parks, Landscape Planning, Ecology and Legislation. The Survival Service Commission is responsible for collecting information on species of flora and fauna which are threatened with extinction. It collates this information, ensures that it is kept up to date and makes recommendations on ways to save endangered species. The information is published in loose-leaf books known as Red Data Books. To date three have been produced: Volume 1—Mammals; Volume 2—Birds; and Volume 4—Pisces. Volume 3—Amphibia and Reptilia is not yet completed.

The work of compiling "Pisces" must have presented enormous difficulties for its compiler, Dr.

Robert Rush Miller, of the University of Michigan. Far less is known about these classes of vertebrates than most others. Naturalists have tended, understandably perhaps, to devote more attention to the more obviously spectacular creatures which inhabit a more familiar environment. Where as it is unlikely that many species of mammals or birds remain to be discovered, scientists are continually finding new species of fish. For example, the seriously endangered species ala balik (*Salmo platycephalus*), from Turkey was first described by Robert Behnke as recently as 1968. One of the reasons for this is the extreme endemism of some species.

Endemism is the phenomenon of a species being confined to a particular locality. It may be surprising to many aquarists to know that of 194 cichlid species in Lake Malawi, 191 occur nowhere else. Occasionally this endemism is spectacular and there are cases where a species may only live in a very limited area. For example, the Mexican blindcat (*Prietella phreatophila*) has only ever been found in one well in Mexico and the Big Bend gambusia (*Gambusia gaigei*) is restricted to only two pools in the Big Bend National Park, Texas. It is highly probable that in the less accessible parts of South America, particularly in mountain regions, there may exist species which are isolated from the lower reaches of rivers by waterfalls. Occasional specimens washed to lower levels are quite likely to be unable to breed or even exist in the warmer waters of the lowlands. They would in any case, be an easy prey for carnivorous species more accustomed to the temperatures.

Having identified endangered species, it is essential to consider the reasons for their endangerment before considering the solutions. Extinction can be natural process or it can be as a result of the work of man.

The natural course of evolution has already, during the millenia, brought about the extinction of countless species. This has been inevitable and is usually the result of over-specialisation and the inability of a species to adapt to a changing environment. A fish might, for example, become entirely dependent on one type of food which for some reason dies out (perhaps also from over-specialisation); deprived of its food supply it is unable to survive. Climatic changes also occur from time to time and some species which may exist in lakes and are unable to adapt must die. Natural extinction can occur from other than evolutionary causes. There are natural catastrophes, such as earthquakes, volcanic eruptions and hurricanes, which may destroy a complete habitat in seconds. Obviously the highly endemic species are most susceptible to extinction from this cause.

Unfortunately the hand of man is not hard to discern in the process of extinction. There are five principal ways in which this happens:

1. *Fishing.*—This can either be of a commercial nature including fishing by individuals for food or it can be for sport. It is not necessary to enter into discussion about the ethics of fishing; for some it is a livelihood and for others it is just good fun. It is unlikely today to be a frequent cause of extinction as self-interest by fishermen may lead to a rationing of the catch or even restocking. It is most likely to be serious accidentally, either in ignorance by primitive peoples or miscalculation by fisheries control agencies. Highly endemic species are in greatest danger. Nevertheless, a number of species are currently in a considerably depleted state as a result of over-fishing. The Amur sturgeon (*Acipenser schrenckii*), was formerly a species of great economic importance but is now rare. Fortunately fisheries are now prohibited. The giant catfish of the Mekong basin (*Pangasianodon gigas*), was also the subject of extensive fisheries and is now threatened with extinction. No protective measures have, so far, been taken. It is a sobering thought that commercial fishing has produced an increased catch every year since 1945 (except 1969) up to 1970, the last year for which a figure is available, when the world estimated catch was nearly seventy million metric tons.

2. *Introduction of predators.*—This is clearly very dangerous and an example of this has been quoted by Ethelwynn Trewavas ("The Red Book", Fisher, J. et al, Collins, London, 1969, p. 345). This is the case of *Oreodaimon quathlambae*, a small cyprinid which lived in a stretch of the River Umkomazana, Natal. No predators existed in this stretch of river because it was isolated by a high waterfall, but trout were introduced and these both competed with it as fry and preyed on it as adults. The problem was made more serious by devegetation which caused an increase in the severity of flood-spates. The fish was until recently believed to be extinct.

Gulaphallus mirabilis, a translucent fish of the Philippines is a member of a small and biologically very interesting family in which males have a copulatory organ situated below the throat. It has suffered severely from the predations of *Gambusia affinis*. Other fish have also suffered from this predator. The Big Bend gambusia referred to above, was at one stage reduced to a total world population of three. *Micropanchax schoelleri* was at one time the commonest small carnivorous fish of the freshwaters of Lower Egypt. Following introduction of *Gambusia affinis* it may very well be extinct.

The catfish (*Diplomystes chilensis*) of Chile is now very rare and endangered following the introduction of trout. *Orestias cuvieri* of Lake Titicaca is possibly extinct following the introduction of the North American lake trout (*Salvelinus namaycush*), (reportedly by the U.S. Fish and Wildlife Service in 1937).

The pike-perch (*Lucioperca lucioperca*), has been

another culprit in several instances. The Cicek (*Acanthorutilus handlirschi*) from Turkey is an endemic species from Lake Egredir and may be extinct already following the introduction of pike-perch in 1953. The Balkash perch (*Perca schrenckii*), of central Asia is another example.

Another species in danger is the Mohave chub (*Gila mohavensis*), which now exists in only one pond in a place with the extraordinary name of Zzyzx Resort in California. The culprit here is a relative, *Gila orcutti*.

3. *Introduction of Competing Species.*—The danger here is less obvious, and for this reason probably more serious. Many non-ichthiological examples will be known to readers. Generally speaking the new species competes for food and if it is more efficient in this respect may not leave any for the original species, resulting in their death. Competition is often most severe in related species. The various subspecies of the cutthroat trout (*Salmo clarki*), in Western America are often in competition with the introduced brook trout, *Salvelinus fontinalis*.

4. *Habitat disturbance.*—This is probably the most serious of all and is the most difficult to prevent. Changes of habitat can result from flooding caused by deforestation or overgrazing, disappearance of water caused by drainage schemes, damming of rivers, diversion of water for irrigation, pollution caused by domestic or industrial waste or by pesticides or other chemicals such as fertilisers washed from agricultural land. The chief difficulty is that conservationists who try to do anything about this kind of destruction are seen by some as reactionaries who would stand in the way of economic progress. The arguments put forward by developers and others are powerful and conservationists have little to say in reply. There are really only two arguments: the desirability of protecting, for its own sake, an irreplaceable object and the suggestion that at some time the fish might be of inestimable importance. The case of the saiga antelope is worth mentioning. Not too long ago this animal was on the verge of extinction but enlightened conservation by the Soviet Government now enables thousands to be cropped annually for food. Food, however, is not the only possible benefit to be derived from fish. Hormone extracts, dyes, drugs of various kinds are easily conceivable and might only be obtainable from an individual species.

Catches of Atlantic sturgeon (*Acipenser oxyrhynchus*), an important food fish of the eastern seaboard of the United States, have been reduced from nearly three quarters of a million pounds in 1908 to only one or two individual fish in recent years. Pollution in rivers and obstructions in spawning streams appear to be the principal reasons. The beloribitsa (*Stenodus leucicthys leucicthys*), of the Caspian Sea is another valuable commercial fish threatened by the construction of dams on the river Volga which will isolate it from its spawning areas. Some protective measures have been instituted.

The characin (*Catabasis acuminatus*), is quite possibly extinct and is indeed only known from a single specimen taken during the nineteenth century. Sewage pollution from Sao Paulo is believed to be the reason for its extermination.

The humpback chub (*Gila cypha*), is a species of minnow which inhabits torrential water in the Colorado river basin. The construction of dams and the use of chemical fish killers have been responsible for its endangerment and for that of the Colorado river squawfish (*Ptychocheilus lucius*), from the same region.

There are very many other examples one might quote: the roughhead shiner (*Notropis semperasper*); the woundfind (*Plagopterus argentissimus*); the Tokyo bitterling (*Tanakia tanago*) are just a few.

5. *Collecting for aquarists.*—There is at the moment probably little danger from this, but it behoves all of us, and importers in particular, to beware of the position. Remember, millions of fish are brought to this country each year. We should never import any which may be threatened with extinction. Rather should we pay for conservation work in the natural habitat. Most of us know something of the fate of the birds of paradise of New Guinea. Let us not be responsible for a similar situation arising with aquarium fish. Of especial concern is the use by many collectors of marine fishes of poisonous chemicals which can cause lasting damage to coral reefs. Even sodium cyanide has been reported to have been used recently and one advertiser feels it necessary to guarantee not using it.

The arapaima (*Arapaima gigas*), is one species where collection for the aquarium trade has contributed to its decline. Small specimens can easily be taken by locating and killing the parent fish. The Ozark cavefish (*Amblyopsis rosae*), existing in only a few caves in Missouri and Arkansas has been the subject of overcollecting. No protective measures have been taken.

From the foregoing it is unlikely that anyone will underestimate the difficulties of conservation. Those working with mammals and birds find enough problems; it is staggering to know that animals such as the orangutan (of which no more than 5,000 are believed to exist in the world), the mountain gorilla (5—15,000), the polar bear (12—14,000), Sumatran rhinoceros (170) and European bison (860) are on the danger list. All these animals added together (and with best estimates) are equivalent in human terms to a town smaller than Salisbury. One would have thought that people would be anxious to protect these animals for posterity and the fact that many

Breeding Habits.—In all three species the male courts the female by butting her from behind, biting her limbs, and mounting clumsily from the rear. The female subsequently digs a hole with her hind feet in soft soil, and there deposits between three and twelve large white spherical eggs. In warm conditions these should hatch in a little over three months.

Care in Captivity.—The following remarks apply to each of the three species already described.

The familiar tortoise is one of the most misunderstood and ill-treated of all household pets. Enormous numbers are imported each Spring, the vast majority of them destined to die within the year. The mass trade in tortoise is utterly and unequivocably to be condemned, both because of the cruelty that it causes to the animals themselves, and for its drastic effects on wild populations.

The new arrivals are doomed both because of the ignorance of their prospective, often well intentioned, owners and on account of the environment to which they are coming.

The tortoise is not a truly hardy animal. These species are imported exclusively from Southern Europe, Asia or Africa, lands where the climate is far different from our own. They favour dry scrub or desert habitats where the summer is long and hot, and the winter, though often extremely cold, is very rarely long. Contrast this with our own damp, cool summers and long, long winters and you will understand the effects that these can have on the health of a physiologically sensitive creature like the tortoise. If it were not for the fact that so many *are* imported I would hesitate to mention tortoise at all in a series dealing with hardy reptiles.

Naturally they cannot be housed indoors in the vivarium when adult, on account of their large size and notably active habits (tortoise are far from being the slouches that many people believe). Instead, the best home for them is a very sizeable greenhouse or conservatory. This should be sunny and well ventilated, with a small, shallow pool and dry soil and atmosphere. Under such conditions the tortoise should prosper mightily, in a climate and habitat that are ideal for their welfare. A centrally placed, brick-built hibernating chamber will give ample protection in the winter months.

It is unfortunate that few of us can afford to provide a perfect set-up such as this. We are forced instead to keep these animals outdoors in conditions that are far from desirable. The situation is not too bad in the Southern counties, where tortoise can do quite well if given proper care, and may live to a ripe old age. But in Northern climes it is downright cruel to keep these creatures outdoors unless the local climate is particularly favourable. This having been said, what are their prime requirements under the average conditions that they are likely to encounter in the English suburban garden?

To start with they must be confined. Tortoise are born wanderers and great escape artists, and it is not sufficient merely to release them in the garden and hope for the best. If you do so they will probably escape, and either get run over or perish at the onset of winter. A completely walled garden makes an admirable home—provided that you remember to block up the gap beneath the garden gate. In ordinary gardens a special enclosure must be built. This can have low walls of brick or of very heavy grade wire mesh (with all jagged points and edges carefully removed). The height of the walls should be not less than a foot, and they should extend an equal distance below ground as a defence against tortoise burrowing out, and rodents burrowing in. The enclosure should be the maximum possible size, for if the inhabitants feel too confined they will spend all their time trying to escape, and, knowing tortoise, they will probably succeed in the end. The landscape included within the enclosure must be both rugged and varied. It is totally unsatisfactory merely to wall off a section of the lawn. Tortoise enjoy exploration and will soon become bored in a featureless environment. There should be hills and rocks, hollows and shrubberies, with a wealth of vegetation. But there must be no abrupt cliffs and no deep ponds, for both could be the cause of nasty accidents. Tortoise are often confined by drilling a small hole through the rear of the carapace, threading a string through this, and tying the string to a pole, wall or brick. This method is to be avoided, for it is both unnecessary and dangerous.

Adequate summer shelter from the elements is also essential. This is best provided in the form of a stout waterproofed wooden box with sloping roof, packed with dry leaves or straw. It should be raised from the ground to protect against draughts, an opening must be cut in one face, access to this being via a gently sloping wooden board. The door should face towards the rising sun and be sheltered from prevailing winds.

In most of the articles of this series I have stressed that hardy reptiles and amphibians should be allowed to hibernate "naturally", i.e. choose their own hibernacula at their own chosen time. This is emphatically not the case with any of these tortoise. If left to their own devices they are unlikely to dig hibernating chambers that are sufficiently deep and warm to protect them against the worst ravages of our winters. This especially applies to clay soils. If they do survive they are likely to wake up during some warm spell in early January, walk about a little—and then get caught by a sudden frost. It is preferable to pack them away in a stout wooden box (their summer shelter is ideal) filled with dry leaves, straw and newspaper. This should then be placed in a

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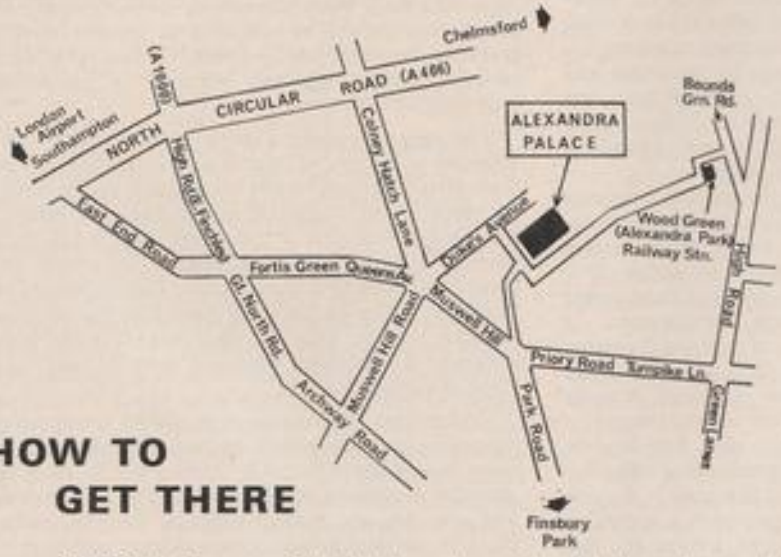

OPEN TO THE PUBLIC

SATURDAY JULY 14th

10.00 a.m. — 9.00 p.m.

SUNDAY JULY 15th

9.00 a.m. — 5.00 p.m.

HOW TO GET THERE

BY TRAIN. From any of the Main line railway stations take the underground tube train to Finsbury Park from where buses W3 or W5 run to Alexandra Palace, or Piccadilly Underground line to Wood Green Station.

BY BUS. Routes to Finsbury Park, 4A, 19, 29, 39, 106, 127, 168A, 221, 236, 253, 259, 279 and Green Line Coaches 715, 715A, 718, from where buses W3 or W5 run to Alexandra Palace. Other routes to Wood Green are buses, W4, W6, 29, 123, 141, 221, 243, 298, 298A and Green Line Coach 715.

BY CAR. From North of London: Follow A1000 over the North Circular Road (A406), turn left into Fortis Green and Queen's Avenue. Turn left at the bottom of Muswell Hill into Alexandra Park. From South London: Take Stroud Green Road from Finsbury Park and follow road into Crouch Hill. Turn right at the bottom of Crouch Hill into Crouch End Broadway, then left into Park Road and Alexandra Park. From the West or East of London: Take the North Circular Road (A406) and follow directions as from the North of London.

Ample free car Parking in the Alexandra Palace Grounds.

THE ENAMEL FIN

by Jack Hems

OTHER popular names for this lovely little shoaling characin are pristella (after its scientific name of *Pristella riddlei*), X-ray fish (on account of its transparent lower parts), Riddle's tetra (after Oscar Riddle, the collector) and goldfinch (derivation unknown).

It is found in the natural state in the rivers and streams of north-eastern South America and was described for science as long ago as 1907. Yet it was not until the 1920s that it became known to tropical aquarists in Europe and America.

The enamel fin is always on the go and frequents the middle of the water. It minds its own business, does not tear or eat the plants, and is hardy enough to withstand a temperature range of about 70°F (21°C) to 85°F (30°C), but 75°F (24°C) or thereabouts is to be preferred for general maintenance. It asks for nothing special in the way of food and flourishes well on any well-balanced dried food enlivened every so often with tiny pieces of raw red meat or some small live food such as gnat larvae or whiteworms.

Externally the sexes are much alike but may be distinguished by the body of the female being taller and more robust-looking than that of the male. A more precise method of telling the sexes apart is known as candling. A strong light is placed behind the fish to disclose the outline of the abdominal sac. In the female this is rounded posteriorly whereas in the male it tapers backwards to a point. Further, in common with several other tetras, the male pristella has tiny hooks at the tip of the rays of some of the fins. Therefore if a fish is taken in a close-meshed net, which is then reversed, the female fish will immediately slide back into the tank while the male will stay behind until a series of vigorous shakes releases its minute hooks from the fabric.

To breed *P. riddlei* separation of the sexes for a week or two is advised. This is to encourage the spawning instinct when the two sexes are brought together again. Yet not every separation brings about the desired result. Feeding to repletion on live food and a slight increase of temperature will help. When the germ-cells are ripe, the male will show brighter colours and greater activity and the female egg-distended sides. It is best to introduce the 'ripe' fish into the breeding tank last thing at night.

The water in the breeding tank should be about 8 in. deep, well-matured and neutral to slightly acid. Cleaniless is essential. Well-washed feathery-leaved plants should be massed at one or both ends of the tank and the temperature, after the introduction of the fish, brought to about 80°F (26°C). The light should be good.

The spawning act is unmistakable. The roe-swollen female will dash about the aquarium hotly pursued by the male. Every time they reach the plants there will be a trembling pause while body-pressings take place and a small number of eggs are extruded. Then the couple will repeat the performance several times over until the female is spawned out. When spawning is completed, the parent fish should be removed to another tank to preclude the eggs being eaten. About a hundred to two hundred eggs are scattered at an average spawning.

The eggs take about a day to incubate and within three or four days of hatching, the fry will become free-swimming and avidly seek food in the shelter the plants afford. It is best to drip feed small infusoria for the first fortnight of their lives, after which micro worms, and the like, and powder-fine dried food should be placed on the menu. Thenceforward, all should go along satisfactorily providing the aquarium is about two feet long or longer and the water is not poisoned by left-over prepared food or any other form of neglect.

The general body colour of *P. riddlei* is translucent brown to greenish yellow melting into almost glass-clear underparts. A black stripe extends from the shoulder to the root of the red caudal fin. The dorsal and anal fins are enamel white at the tips, intense black in the middle and lemon to pale yellow at the base. There is a black spot in the anterior part of the green-tinged ventrals. The pectoral fins are clear. Less frequently seen is an albino form. In this tank-developed form the body is a sort of translucent silvery pink, with some deeper pink markings. Like other ablinoes, the eyes are red-currant red. As red-eyed fish are sensitive to a strong light, the albino pristella should be kept in a tank well-stocked with tall-growing plants to afford patches of shade. It is hardly necessary to say that *P. riddlei* is ideally suited to a community tank.

From a Naturalist's Notebook

by Eric Hardy

ANY FISH-BREEDER with £16·25 to spare might be interested in the most comprehensive book on the latest knowledge of basic nutritional requirements of fish reared in tanks, ponds and streams, the 726 pages "Fish Nutrition" edited by J. E. Halver, of the Western Fish Nutrition Laboratory at Washington. Experts cover in rather technical details the dietic needs, feed formulations and nutritional diseases. One may go further and suggest that anyone with £64·20 to spare might well invest it in the 6 volumes outstanding work on "Fish Physiology," edited by W. S. Hoar and D. J. Randall, of British Columbia University zoology department, and also published by Academy Press recently. This covers almost everything a fish can do, internally and externally, from reproduction and growth to pigmentation and poisons, electric organs, migrations, learning and memory, sound production and vision, down to bioluminesence and the development of its larvae. Even the 1973 edition of the International Zoo Year Book is £8, or £6 paper-backed.

The Gila top minnow, a 2-inch live-bearer, which I mentioned the other year, has been saved from extinction in Arizona by successfully restocking new habitats from the last two small spring-fed areas to restocking new habitats from the last two small spring-fed areas to which it had been reduced.

Discussing water-plants with our local aquarist society recently, I was able to draw attention to the great diversity in their habits. Though water-plants grow quicker and easier than land plants, altering the rate of current often induces the plant to change shape of its leaves, notably so with water-crowfoot (whose flowers will even pollinate themselves when submerged), and vernal starwort (*Callitriche*) which increases its long narrow leaves as the water deepens, and its broader surface leaves in shallower water. Amphibious bistort (*Polygonum*) grows more hairy leaves when free of water on the damp mud. Slow growers like the stoneworts (*Chara* and *Nitella*) often get covered with tank-sediment. Aquatic plants with runners creeping like Jenny (*Lysimachia nummularia*), frogbit, Ambulia and *Cryptocoryne* seldom produce seed. Asiatic sweet flag (which isn't an iris like yellow flag) doesn't set its seed here because the insect which fertilised it doesn't occur in Britain. Lesser celandine rarely sets seed, but reproduces by spates washing its root-tubers from the streamsides.

Frogbit usually floats as well as duckweed without anchorage. After flowering, bladderwort sheds its bladders and sinks for the winter. New shoots at the tips of curled *Potamogeton* break off and sink to the bottom safe from frost till spring; but vernal sandwort keeps bright green in water exposed to winter frost. *Cryptocoryne* wants 60-90°F or it usually dies. Water soldier extracts carbonate of lime at the end of summer and sinks with the extra weight. Several aquatics produce winter buds which drop to the bottom and propagate new plants the following year.

Most aquatic umbelliferous plants are highly poisonous; so are most of the buttercup family when flowering, excepting water-crowfoot. While *Sagittaria natans* needs plenty of light, *Cryptocoryne* needs shade. Stoneworts tolerate stagnant, shaded water. Yellow water-lily (*Nuphar*) prefers deeper, shadier water than native white water-lily. Furthermore, water-lillies aren't lilies but nearer berberises, paeonies and buttercups. So-called fringed water-lily is in the bogbean family, not the water-lilies (and bogbean isn't a bean). Hairgrass or "least spiked rush" is a sedge; flowering rush isn't a rush, but nearer arrowheads and frogbits. Water-violets aren't violets, but nearer primroses, and we have one of the only two species known, the other being in North America.

Not all aquatics have the same value as oxygenators, *Sagitarria natans* and *Elodeas* being good, the adaptable Ludwigia being poorer. Fishes aren't without their choices when it comes to spawning among them, preferring the small willow moss *gracilis* to larger *antipyretica*. The Rasboras favour *Cryptocoryne*.

The Zoological Society's annual report, presented to their annual meeting at London Zoo in May, noted a replacement for the giant salamander which had been 40 years in the collection. In six months, two female giant tortoises from the Seychelles had grown from 305 mm. to 336, and from 298 mm. to 324, respectively. Paignton Zoo's recent 52-page illustrated annual report, kindly sent to me, mentions their acquisition from Perth Zoo of some common Australian oblong tortoises (*Chelodina oblonga*), not often seen in this country. They artificially hatched some basilisks and reared them on a diet of locusts. They use the catfish *Plecostomus punctatus* as a scavenger, for feeding on algal growth. They also have the large torpedo-shaped amphibious catfish, *Clarias batrachus*, whose air-breathing organs enable

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ANY FISH-BREEDER with £16·25 to spare might be interested in the most comprehensive book on the latest knowledge of basic nutritional requirements of fish reared in tanks, ponds and streams, the 726 pages "Fish Nutrition" edited by J. E. Halver, of the Western Fish Nutrition Laboratory at Washington. Experts cover in rather technical details the dietic needs, feed formulations and nutritional diseases. One may go further and suggest that anyone with £64·20 to spare might well invest it in the 6 volumes outstanding work on "Fish Physiology," edited by W. S. Hoar and D. J. Randall, of British Columbia University zoology department, and also published by Academy Press recently. This covers almost everything a fish can do, internally and externally, from reproduction and growth to pigmentation and poisons, electric organs, migrations, learning and memory, sound production and vision, down to bioluminesence and the development of its larvae. Even the 1973 edition of the International Zoo Year Book is £8, or £6 paper-backed.

The Gila top minnow, a 2-inch live-bearer, which I mentioned the other year, has been saved from extinction in Arizona by successfully restocking new habitats from the last two small spring-fed areas to restocking new habitats from the last two small spring-fed areas to which it had been reduced.

Discussing water-plants with our local aquarist society recently, I was able to draw attention to the great diversity in their habits. Though water-plants grow quicker and easier than land plants, altering the rate of current often induces the plant to change shape of its leaves, notably so with water-crowfoot (whose flowers will even pollinate themselves when submerged), and vernal starwort (*Callitriche*) which increases its long narrow leaves as the water deepens, and its broader surface leaves in shallower water. Amphibious bistort (*Polygonum*) grows more hairy leaves when free of water on the damp mud. Slow growers like the stoneworts (*Chara* and *Nitella*) often get covered with tank-sediment. Aquatic plants with runners creeping like Jenny (*Lysimachia nummularia*), frogbit, Ambulia and *Cryptocoryne* seldom produce seed. Asiatic sweet flag (which isn't an iris like yellow flag) doesn't set its seed here because the insect which fertilised it doesn't occur in Britain. Lesser celandine rarely sets seed, but reproduces by spates washing its root-tubers from the streamsides.

Frogbit usually floats as well as duckweed without anchorage. After flowering, bladderwort sheds its bladders and sinks for the winter. New shoots at the tips of curled *Potamogeton* break off and sink to the bottom safe from frost till spring; but vernal sandwort keeps bright green in water exposed to winter frost. *Cryptocoryne* wants 60-90°F or it usually dies. Water soldier extracts carbonate of lime at the end of summer and sinks with the extra weight. Several aquatics produce winter buds which drop to the bottom and propagate new plants the following year.

Most aquatic umbelliferous plants are highly poisonous; so are most of the buttercup family when flowering, excepting water-crowfoot. While *Sagittaria natans* needs plenty of light, *Cryptocoryne* needs shade. Stoneworts tolerate stagnant, shaded water. Yellow water-lily (*Nuphar*) prefers deeper, shadier water than native white water-lily. Furthermore, water-lillies aren't lilies but nearer berberises, paeonies and buttercups. So-called fringed water-lily is in the bogbean family, not the water-lilies (and bogbean isn't a bean). Hairgrass or "least spiked rush" is a sedge; flowering rush isn't a rush, but nearer arrowheads and frogbits. Water-violets aren't violets, but nearer primroses, and we have one of the only two species known, the other being in North America.

Not all aquatics have the same value as oxygenators, *Sagitarria natans* and *Elodeas* being good, the adaptable Ludwigia being poorer. Fishes aren't without their choices when it comes to spawning among them, preferring the small willow moss *gracilis* to larger *antipyretica*. The Rasboras favour *Cryptocoryne*.

The Zoological Society's annual report, presented to their annual meeting at London Zoo in May, noted a replacement for the giant salamander which had been 40 years in the collection. In six months, two female giant tortoises from the Seychelles had grown from 305 mm. to 336, and from 298 mm. to 324, respectively. Paignton Zoo's recent 52-page illustrated annual report, kindly sent to me, mentions their acquisition from Perth Zoo of some common Australian oblong tortoises (*Chelodina oblonga*), not often seen in this country. They artificially hatched some basilisks and reared them on a diet of locusts. They use the catfish *Plecostomus punctatus* as a scavenger, for feeding on algal growth. They also have the large torpedo-shaped amphibious catfish, *Clarias batrachus*, whose air-breathing organs enable

it to exist several hours out of water. This is not peculiar to this catfish. When I was secretary of the old Jerusalem Naturalists' Club I studied the scaleless Nile Catfish (*Clarias lazera*) in the Sea of Galilee, where its presence originated an old myth that it arrived via a subterranan link with the Nile. This could also live a few days on dry land, due to its aborescent gills which don't collapse when it is out of water, but they have to remain damp for it to continue to respire. It also utters a cat-like squeak when on land, recalling the "Talking catfish" (*Acanthodoras spinosissimus*) which grunts when handled.

Though the golden orfe (*Leuciscus idus*), has been established in several British lakes as at Woburn Abbey, St. James' Park in London, and Hiltree reservoir at Elstree, the so-called silver orfe, native to Germany, Austria, Greece and South Russia, was established in a few private waters long before the war. The golden orfe is a variety of the European ide, which was introduced to Britain in the latter half of the 19th century. It can grow to 20 ins., but isn't so popular in ornamental lakes and ponds as the golden orfe. The silver orfe is quite different, as its name *Leucaspius delineatus* implies. The former is nearer dace and chub, the latter related to bleak. The silver orfe isn't even in the list of British fish circulated among the recent mappers of fish-distribution for the forthcoming Atlas of British fishes, though it includes golden orfe and bitterling.

Silver orfe breed freely in spring, among water-plantain, spiralling its bands of eggs around the plant-stems. It grows only to 2 or 3 inches and looks like a slender, more shiny, minnow. It is also called burnished bleak, though it is neither bleak nor orfe. It takes readily to tank life, where it is fed on *Daphnia* and bloodworms. Some fanciers train a mirror on to the tank to enhance its brilliant appearance.

The golden tench is, of course, a less hardy variety of common tench which arose as a sport over 170 years ago. It probably wouldn't winter in most open northern waters, but unless you have a very large tank, it is easier to rear in garden ponds, where it mixes well with golden orfe, the golden variety of common rudd and goldfish.

"Golden bleak" are merely common bleak dyed with acriflavine and preserved with formalin to substitute for live bait in angling, like "golden sprats".

The Fancy Guppy Association at the 1973 International Guppy Show and F.G.A. World Guppy Championship

TWENTY-SEVEN members of the Edmonton Society of the Fancy Guppy Association made a very rewarding trip to the Annual International Guppy Show which was held at Birmingham on Sunday, 27th May.

This year for the first time ever the F.G.A. World Guppy was held in conjunction with the International Show. This new event attracted fourteen entries from all over the world, each entry comprising of five perfectly matched male Guppies and five perfectly matched female Guppies, these 140 guppies made a very eye catching display the like of which has never been seen in this country. The winner of the event was the well-known guppy breeding partnership of Don and Babs Phillimore from the Edmonton Section of the Association, who also took the third place with their second entry.

Out of a total 35 classes in the International Guppy Show, Edmonton section members took first place in 19, second place in 16, third place in 10 and fourth in 6, scoring a total of 211 points to win the "Calgary Trophy" for the fourth year in succession, this was an all-time record of points for an individual section. There was a total entry of 700 comprising over 1,000 guppies in all. Edmonton section members also took all the major awards in the International these were: Best Exhibit in Show, Best Breeders: Breeders

Match Pairs—Mr. and Mrs. Brian Burnell, 79 points. Best Male, Long Dorsal Veil, 78 points—Wally Bishop. Best Female, Natural Tailed Female, 75 points—Ken Lee. Master Breeders' Trophy, Master Breeders, 76 points—Don and Babs Phillimore.

The section which holds its meetings on the first Sunday of every month welcomes people who are interested in breeding and keeping guppies to their meetings, starting at 3 p.m. in the Royal British Legion halls, Holtwhites Hill, Enfield, Middlesex. Further details can be obtained from the secretary, Don Phillimore, 103 Wilbury Way, Edmonton, London, N18 1BX. Tel: 01-803 3012.

RECENT CICHLID INTRODUCTIONS

by T. J. S. Straight

SINCE the beginning of this year, a small number of Cichlid species has been made generally available to aquarists. Their reputations have, already, preceded their arrival, mainly through American sources. This particularly applies to the Red Devil Cichlid (*Cichlasoma grythraeum*). It is described as a large, vicious fish from Central America, usually coloured red, but sometimes golden or white. My two specimens failed to fit the description. They were a dull-grey basic colour, with five to six black stripes on their flanks which faded when they were in a settled mood. The only hint of red was a slight flush around the throat, similar to a Firemouth Cichlid, which they closely resemble. Although they scrapped with each other, they kept clear of their companions, two Oscars and a Pike Cichlid. It was obvious from the size of their mouths, they could swallow fairly large chunks of food, so I gave them a basic diet of chopped-up horsemeat, supplemented by *tubifex* and *daphnia*. They were about two and a half inches when I bought them, but after two months were touching four inches. The constant scrapping forced me to separate them, enabling them to grow attractive extensions to their dorsal and anal fins. Although interesting fish, their very novelty means a price of £2 each, which means they are really a specialist's fish. Apart from this, they do have moods when they refuse to touch any food. This applies particularly during the first few weeks after purchase.

A slightly more practical proposition is *Horotilapia multispinosa*, the Rainbow Cichlid. This particular fish could be a serious challenger to the Convict Cichlid's position as a beginner's Cichlid. It is similar in size, which is about three inches for an average adult, as well as in coloration. *Horotilapia* have an olive-green basic colour overlaid with the usual stripes, but the red iris of the eyes is the most attractive feature, comparing favourably with the Convict's golden flecks, found in the dorsal fin and abdomen area. In clear water, well aerated, *Horotilapia* are extremely active and healthy, a group of four or five providing constant entertainment with their mock battles and spawning activity. They thrive on dried food, with the occasional treat of live food. Prices vary from 50p to £1·25, but one has to shop around to find them. A large tank is needed, since they appear to lose their attractive coloration in small aquariums. Each time I bought one it was to be found in some small tank, and barely recognisable in the dark black colour assumed. Well worth the effort if you have a spare three-foot tank, decorated with some rocks and a flowerpot of two.

Lastly, there is a pink variety of the unpopular *Tilapia mossombica*. This mutation should prove more acceptable because it has various combinations of red and black colouring dotted on the pink body. Like the normal variety, this fish grows rapidly, even in a confined space. One of my specimens reached eight inches within six months of his purchase at two inches. They are extremely territorial and many are bought. One male will always dominate the tank and make life miserable for his companions. I find them impossible to breed since the male insists on killing the female before, rather than after, spawning. Once again, a large tank, well filtered is necessary, because of the vast quantities of food they consume, and their continuous digging activities. They would go well in a large Cichlid tank, but otherwise are not recommended. Looking around the local shops, it appears they have not caught the imagination of aquarists, since most of the original stocks are still waiting to be sold.

These three are the most commonly available of recent introductions, but also obtainable are *Uaru amphiocanthoides*, Golden Angelfish, Gold Severum, and various Cichlids from the Rift Lakes of East Africa. Obviously, it is these types of fish which keep the hobby what it is, with the aquarists always prepared to experiment with new species. Let's hope it continues.

Coldwater Fishkeeping

THE BREEDING SEASON

by Arthur Boarder

IT IS almost certain that every owner of a garden pond will look forward each spring to the breeding season. It does not seem to matter whether the pond is a very small one or a large one, the owner will expect to get a great deal of satisfaction from the breeding of a few fishes, even if they are only the common goldfish. Whether many youngsters reach adult stage will depend on many circumstances. All healthy goldfish will have the urge to spawn and providing nothing is done to upset the balance of the water it is probable that in due time the fishes will oblige and if there are plenty of under-water oxygenating plants the fact that a few youngsters may be reared is a possibility. It is well known that the parent fish will eat the eggs or young if they can get at them and so if a number are to be reared it is certain that steps will have to be taken to ensure that all the eggs or fry are not devoured.

Many aquarists construct the pond without making any provision for spawnings. This is a mistake; as if the need to produce more fishes is there, then the owner of the pond can do plenty to ensure that at least a few fry are reared. If a sloping base was included in the pond construction, then this is half the battle. Most fishes will spawn in the shallowest water they can find and so if a shallow end is provided it will make it quite easy for the pondkeeper to be able to collect the eggs and rear them in safety. My own breeding pond was made with the breeding of fantail goldfish in view. The main pond was constructed in a rough oblong shape with a narrow neck running to a concrete path, where the bottom ran up to nothing.

This position is where I place the water weed on which the fish will spawn and every year they oblige as expected. The pond was made in 1937 and each year since then the fish have spawned and always in the narrow, shallow part. I do not have under-water plants anywhere else in the pond, just a water lily or two to provide some shade from the sun and to discourage the formation of too much green *algae*. I do not suggest that all the eggs are laid in the spawning area, but as far as I can tell the fish do not spawn anywhere else. Fishes appear to know that the shallow water is the best place in which to spawn as no fishes are likely to swim in such shallow water once the spawning urge is over. Over many years of breeding I scarcely ever find any fry in the pond and if the fish spawned all over it there is no reason why a few at least would not survive.

This year has been a strange one, as the water in the pond did not appear to warm up at all until well into the second week in May. I cleaned out the pond completely in December last year and the water remained clear until February when the fairly mild weather encouraged some *algae* to form. From then on no fish were visible at all. All through March and April the nights were very cold and it was not until the wind left the East that the weather turned rather mild. I then noticed that as soon as the sun came out, some of the fish came to the surface to lie motionless under patches of duckweed which was floating on the top. They did not swim around and were obviously not on the feed. I gave no food at all the

whole of the winter except a few broken garden worms in January when I could see that they were being taken.

When the fish are quiet it is dangerous to offer them dried food as this is the surest way to turn the water foul and then the fish become unwell and lose some of their mucus covering. The consequence of this is that they can then be attacked by the fungus disease. Many pondkeepers complain that their fish are unwell and it is their own fault through feeding when the fish are not ready for it.

Once the weather turned milder, I emptied and thoroughly cleaned all my hatching tanks. I then was ready for the first spawning. On the morning of the 20th of May, I noticed two or three fantails lying together in the spawning corner. I had already placed a couple of bunches of Hornwort, (*Ceratophyllum demersum*), in the spawning area and anchored them to the side. I had included two galvanised nails in the cement when lining the pond and I tie the weed with green twist, as used by gardeners. As soon as I saw the fish in the corner I constructed another couple of bunches in reserve.

I then heard the usual splashing in the corner and with a thrashing of tails the fishes dashed across the top of the bunches of weed and were away to swim lazily round the pond. Two or three males were in attendance and they just performed by pushing quietly at the female and gently guiding her back to the spawning area. They would lie there motionless for a time and then all of a sudden the frantic splashing would go on again and more eggs would be laid. The fish which were spawning were two year olds and I did not see any of the older fish taking part in the chasing. I left the bunches of weed for some hours as the fish were still spawning up to late afternoon. I had prepared the hatching tanks with fresh water and added a 100 watt heater with thermostat set at 70°F. I also put on some slight aeration as there is no better way of ensuring a good hatch than by providing plenty of oxygen around the eggs.

On the following mornings few of the older fantails were spawning. These were large fish and I expected that plenty of eggs would be laid. I have never been able to find out at what age the fantails cease to spawn. In the past I have had them do so at at least fifteen years of age and I have had youngsters spawn at eight months old. I do not know my individual fish and just add one or two good youngsters to the pond each year, that is if any are good enough to join the breeders.

The temperature of the pond water was 54°F., when the fish first spawned and it had risen a couple of degrees by the next day. The temperature of the hatching tanks varied from 70°F. to 76°F., as I keep the tanks in an outside large frame. The sun warms this up considerably and even without artificial heat the water temperature rises very quickly. It is surprising how a sheet of glass can attract the warmth and even if the sun is hidden behind the clouds some warmth is always attracted. I do not mind if the temperature of the water varies somewhat as this is what one would expect in nature.

Two days after the first spawning a little Liquifry was added to the water so that some *infusoria* could be encouraged to form by the time the fry hatched. The usual time for a hatch is three and a half days when the temperature is kept round about the 70°F. mark. Once the fry are free swimming I shall add a little water from the spawning pond as this will contain plenty of tiny life, both animals and vegetable. I add this water gradually with a small saucepan and have a small piece of material hanging over the side of the tank so that some of the water may drain away. When using this form of siphon one must ensure that the end of the material in the water is not allowed to hang down too far or else too much water will run out to waste.

The adult fish in the pond do not yet appear to be on the feed and so no regular feeding will take place until I see that they are on the feed well. Once I see them eating the duckweed from the surface I shall know that they are ready to be fed. The main spawning has not yet taken place and I expect that when the majority of fish make a start I shall have many as eggs as I can cope with. I prefer a small spawning at a time as I am certain that one is more likely to get a goodly number hatch out when there have not been to many eggs laid at a time.

Some fresh water is added to the pond to make up for that taken out for the fry tanks. When running in the pond water to the tanks I always run it through a fine net to make sure that there are no harmful pests introduced into the tanks. One careless mistake and trouble can ensue, and it is not always easy to get things right again. Just one or two newt tadpoles dropped into the tanks and many fry could be lost. It is often attention to the small details that ensures that success will be attained and not failure.

Last season I lost a number of young fish through blackbirds and so this year all the hatching tanks will be covered by glass sheets. This is the first time that I have lost fish through blackbirds, but one never knows what may happen next. On six occasions within a fortnight this year I have found a pair of Mallards on my pond. This is quite near to the house and the ducks looked at me in amazement when I tried to shoo them away. I am not sure whether these ducks would have eaten the fish but I was not taking any chances. I fixed some fine wire across the pond to stop them flying in but the next day they were walking across the lawn towards the pond and so that scheme went for a burton.

News from AQUARISTS' SOCIETIES

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

We regret that owing to pressure on space the following Societies Show results have been held over—Blakeborough, Rochampton, Goole & District, Croydon, York, Osram, Gloucester, Derby Regent. We hope to include these in August issue.

FINAL results of **Stanley and Consett A.S.** first open show were as follow: A.V. Guppy: 1, Mr. Nesworthy (Peterlee); 2, Mr. and Mrs. Sawerby (Mount Pleasant); 3, Mr. Laidler (N.G.L.S.). A.V. Mollie: 1, Mr. Brown (Mount Pleasant); 2, Mr. Nesworthy (Peterlee); 3, Mr. and Mrs. Liddle (Ashington and District). A.V. Swordtail: 1, Mr. Smith (Ashington and District); 2, Mr. Elliott (Stanley and Consett); 3, Mr. Aitkinson (Mount Pleasant). A.V. Barb (small): 1, Mr. Alexandra (Washington); 2, Mr. Hubbard (Peterlee); 3, Mr. Edwards (Blyth). A.V. Barb (large): 1, Mrs. Gray Mount Pleasant); 2, Mr. Stephenson (Stanley and Consett); 3, Mr. Hall (Washington). A.V. Characin (small): 1, Mr. Gardiner (Washington); 2, Mr. Duncanson (Priory); 3, Mr. Fisher (Washington). A.V. Characin (large): 1, Mr. Burns (Whitley Bay); 2, Mr. Duncanson (Priory); 3, Mr. and Mrs. Bailey (Sherwood). A.V. Fighter: 1, Mr. Hubbard (Peterlee); 2, Mr. Hope (Washington); 3, Mr. Harrill (Independant). A.V. Cichlid (small): 1, Mr. Clemenson (Independant); 2, Mr. Peadan (Mount Pleasant); 3, Mr. Turnbull (Mount Pleasant). A.V. Cichlid (large): 1, Mr. Aitman (N.T.F.S.); 2, Mr. Cartlidge (Independant); 3, Mr. Buglass (Blyth). A.V. Rasbora/Danio: 1, Mr. Hall (Washington); 2, Mr. Hope (Washington); 3, M. Lister Jnr. (Stanley and Consett). A.V. Angels: 1, Mr. and Mrs. Bailey (Sherwood); 2, Mr. Kent (South Shields); 3, Miss Jones (Stanley and Consett). A.V. Toothcarp: 1, Mr. Gardiner (Washington); 2, Mr. Cutting (B.K.A.); 3, Mr. Cartlidge (Independant). A.V. Labyrinth: 1, Mr. Cartlidge (Independant); 2, Mr. Peaden (Mount Pleasant); 3, Mr. and Mrs. Wright (South Shields). A.V. Coradoras: 1, Mr. and Mrs. Bailey (Sherwood); 2, Mr. Staines (Ashington and District); 3, Mr. Quantrill (Whitley Bay). A.V. Catfish: 1 and 2, Mr. Stephenson (Stanley and Consett); 3, Mr. Turnbull (Mount Pleasant). A.V. Loach: 1, Mr. Nesworthy (Peterlee); 2, Mr. Turnbull (Mount Pleasant); 3, Mr. Smith (Ashington and District). A.V. Shark/Labeo: 1, Mr. Brown (Mount Pleasant); 2, Mr. Wright (Houghton); 3, Mr. Robinson (Whitley Bay). A.O.V. Egglayer: 1, Mr. and Mrs. Liddle (Ashington and District); 2, Mr. White (N.T.F.S.); 3, Mr. and Mrs. Bailey (Sherwood). Flying Fox: 1, Mr. Gardiner (Washington); 2, Mr. Hubbard (Peterlee); 3, Mr. and Mrs. Bailey (Sherwood). Breeders Class (Egglayer): 1, Mr. Hubbard (Peterlee); 2, Mr. Wyatt (Washington). Breeders Class (Livebearers): 1, Mr. and Mrs. Sawerby (Mount Pleasant); 2, Mr. Laidler (N.G.L.S.); 3, Mr. Crombie (Peterlee). Breeding Pairs (Livebearers): 1, Mr. Hubbard (Peterlee); 2, Mr. and Mrs. Sowerby (Mount Pleasant); 3, Mr. Laidler (N.G.L.S.). Breeding Pairs (Egglayer): 1, Mr. Davidson (Mount Pleasant); 2, Mr. Aitman (N.T.F.S.); 3, Mr. Nesworthy (Peterlee). A.V. Coldwater: 1, Mr. and Mrs. Davidson (Ashington and District); 2, Mrs. Bell (Blyth); 3, Mr. Foreman (Stanley and Consett). A.O.V. Tropical: 1, Mr. Laidler (N.G.L.S.). A.V. Junior: 1, Master Bailey (Sherwood); 2, Master Lister (Stanley and Consett); 3, Master Kitto (Stanley and Consett). Furnished Jars: 1, Mr. Snaith (Mount Pleasant); 2 and 3, Mr. Glass (South Shields). A.V. Platties: 1, Mr. Crombie (Peterlee); 2 and 3, Mr. Hubbard (Peterlee). Rift Valley Cichlid (Malawi): 1, 2 and 3, Mr. Hubbard (Peterlee). Breeders live (4 fish): 1, Mr. Hope (Ashington); 2, Mr. and Mrs. Coates (South Shields); 3, Mr. Nesworthy (Peterlee). Breeders (Egglayers): 1, Mr. Cutting (B.K.A.). Best Fish in Show: H. Hubbard (Peterlee).

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THE **Kettering A.S.** show results were as follow: Barbs: 1 and 2, M. Crew (W.A.D.A.S.); 3, R. Elliott (Corby). Characins (to 4in.): 1, R. Elliott (Corby); 2 and 3, P. Moye (Bletchley). Characins (over 4in.): 1, P. Moye (Bletchley); 2, L. Brazier (Sudbury). Cichlids (DZ): 1, J. Dainty (Kettering); 2, R. Marshall (W.A.D.A.S.); 3, D. Page (Corby). Cichlids (D.C.): 1, G. E. Dixon (Newbury); 2, D. Carnegie (Corby); 3, C. C. Cartwright (L.A.S.). Angels: 1, K. Tillin (Kettering); 2, C. Pratt (Bedworth); 3, R. Elliott (Corby). Dwarf Cichlids: 1, P. Moye (Bletchley); 2 and 3, A. Slow (Corby). Labyrinths: 1, G. Clayton (Lucas); 2, L. Brazier (Sudbury); 3, G. Pywell (Kettering). Egglaying Tooth Carp: 1, T. Allen (Bedworth); 2, J. Salisbury (Bedworth); 3, P. Wallis (W.A.D.A.S.). Tropical Catfish: 1, L. Brazier (Sudbury); 2, D. Bitchener (W.A.D.A.S.); 3, K. Dellow (Corby). Corydoras/Brochis: 1 and 2, P. Moye (Bletchley); 3, R. Elliott (Corby). Rasbora: 1 and 3, D. Bitchener (W.A.D.A.S.); 2, K. Pratt (Bedworth). Danio/W.C.M.M.: 1, A. Marshall (W.A.D.A.S.); 2, R. Elliott (Corby); 3, G. Allen. Loaches: 1, A. Thomas (W.A.D.A.S.); 2, R. Elliott (Corby); 3, J. Salisbury (Bedworth). A.O.S. Egglaying Tropical: 1, G. Brazier (Sudbury); 2, E. Rossiter (W.A.D.A.S.); 3, C. Pratt (Bedworth). Egglaying (Pairs): 1, G. Brazier (Sudbury); 2, G. Allen; 3, D. Carnegie (Corby). Livebearer (Pairs): 1, 2 and 3, G. Holmes (Banbury). Guppies: 1 and 2, G. Brazier (Sudbury); 3, E. Rossiter (W.A.D.A.S.). Swordtails: 1, T. Allen (Bedworth); 2, R. Peers (Coventry); 3, R. Elliott (Corby). Platies: 1, L. Brazier (Sudbury); 2, C. Pratt (Bedworth); 3, P. Moye (Bletchley). Mollies: 1, 2 and 3, G. Allen. A.O.S. Livebearers: 1, L. Brazier (Sudbury); 2, A. Poole (Banbury); 3, P. Flint (W.A.D.A.S.). Single Tail Goldfish: 1, R. Shakespeare (Bedworth); 2, C. C. Cartwright (L.A.S.); 3, G. Allen. Twin Tail Goldfish: 1, R. Bentley (W.A.D.A.S.); 2, C. C. Cartwright (L.A.S.); 3, R. Shakespeare (Bedworth). Livebearer Broods: 1 and 2, P. Holmes (Banbury); 3, T. Allen (Bedworth). Egglayer Broods: 1, G. Clayton (Lucas); 2, D. Carnegie (Corby); 3, L. Brazier (Sudbury). Best fish in show: G. E. Dixon (Newbury).

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THREE new members were welcomed by the chairman at the May meeting of the **Gloucester Fishkeeping & Social Club.** He said that the membership had increased by over 50 per cent since last October, and that a very encouraging sign was in the number of keen junior members.

This year the society is once again putting on a display of Home Aquariums and fishkeeping of both coldwater and tropical fish during the Carnival Exhibition which is held in Gloucester Park the last week of July. Th stand always attracts a lot of interest from the general public.

The society were fortunate to have a return visit from Mr. Gordon Churchill who is always one of the favourite speakers. His talk, together with a slide show dealt with Home Aquarium Competitions, and included slides of the tanks in last year's contest.

The table show was in two sections, Coldwater and A.V. Cichlids. The winners in the coldwater class were: 1 and 3, Mrs. M. Mitchell; 2, T. Collier; 4, A. Lamb. The section for Cichlids was very well supported and one of the new members, T. Diamond, was first, T. Collier being second with Mrs. E. Adlam being third and fourth.

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THE first meeting in May of the **Hastings and St. Leonards A.S.,** consisted of a quiz. The subject was a wide variety of freshwater and marine fishes and B. Funnell was quizmaster. G. Pryke (chairman) announced to the club that there would be a contest of Garden Ponds later in the year. The Table Show was for Barbs, J. Grieg was the judge, the winners being: 1, T. Adams; 2, G. E. Chalcroft; 3, Andrew Reed.

A talk was given by G. Pryke at the second meeting on Beginning an Aquarium. He was assisted by B. Funnell, who spoke on the gravel and rocks needed. Mr. Pryke's talk covered the first aquariums which had slate bottoms which were heated with Bunsen burners or oil heaters, up to the modern tank. Mr. Pryke completed his talk, explaining the problems of the pH of water. The Table Show for Labyrinths was judged by A. McCormick and the result was: 1, C. Pannell; 2, T. Adams; 3, Mrs. French.

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THE second leg of the Inter-Club competition between **North Kent, Southend, Thurrock** and **East London Societies** was held at the East London Club in May. The results were as follow: Southend 16 pts.; Thurrock 15 pts.; North Kent 11 pts.; East London 8 pts. The progressive totals with two more legs to go reads as follow: Thurrock 42 pts.; Southend 30 pts.; North Kent 17 pts.; East London 11 pts. A very enjoyable evening was made more so by an excellent talk (with slides) by the very capable Hendon Group. Thanks were expressed by Mike Pearson, East London's chairman, to them and all the entrants in the Inter-Club competition for making the evening such a success.

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THE **Fancy Guppy Association** (Birmingham Section) 1973-74 Points Cup Trophy, comprises twelve calendar monthly competitions. Table Shows 1-3 inclusive: first ten positions only: Mr. and Mrs. Phillimore 141 pts; K. Lee 81 pts.; G. Steadman 61 pts.; Mr. and Mrs. Burnell 50 pts.; A. Charlton 49 pts.; W. Bishop 45 pts.; J. Eskith 34 pts.; M. Dellingpole 26 pts.; H. Baldwin 25 pts.; Mrs. M. Steadman 23 pts. Best Male L.D.V.: W. Bishop. Best Female Roundtail: K. Lee. Best Breeders Pairs: Mr. and Mrs. Burnell. Best in Show: Breeders Pairs: Mr. and Mrs. Burnell. The Association meet on the fourth Sunday afternoon of each month at the Glebe Farm Community Centre, Stechford, Birmingham.

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THERE have been some interesting talks at recent meetings of the **Wrexham T.F.S.** One was given by T. Pound on Aquarium Accessories, mostly on those that can be home made. Some very useful suggestions came to light from members contributing items they had made. Another talk was given by E. Jones on Community Tank Breeding which was also well received by members and was very enlightening and enjoyable. At another meeting a Slide Show was put on of slides taken by members. The Table Show results were as follow: Characins: 1 and 3, T. Pound; 2, Mrs. U. Oliver. Barbs: 1, 2 and 3, R. Mathers. Livebearers: 1, Mrs. S. Darcy; 2, T. Pound; 3, E. Jones. A.O.V. Cats: 1 and 2, Mrs. S. Darcy; 3, Master B. Roberts. Botias: 1, T. Pound; 2, Mrs. S. Darcy; 3, E. Jones. Loaches: 1, T. Pound. Best Junior: Master B. Roberts.

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MEMBERS and friends of the **Ilford and District A. and P.S.** took part in a pictorial

quiz on fishes, tropical plants and fish behaviour produced by Michael Shadrack at the May meeting. The Table Show for May was for A.V. Labyrinth, Swordtail or Goldfish, and the winners were as follow: A. V. Labyrinth: 1 and 2, W. Rowe; 3 and 4, Mrs. P. Reade. A.V. Swordtail: 1 and 2, D. Seaman; 3, G. Irish; 4, Miss J. Frostick. A.V. Goldfish: 1 and 4, H. Berger; 2, W. Rowe; 3, B. Dixon. Anyone interested in fishkeeping, tropical or coldwater, will be welcome at future meetings and for further information should contact the secretary, Ron Ruth, 103 Heath Road, Chadwell Heath, Romford.

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THE main item at the June meeting of the **Bedworth A. and P.S.** was the Bring and Buy, with many items being auctioned off by committee member K. Upton. The Table Show for the evening was split into two classes of exhibitor, these being "A" and "B" class. An "A" class exhibitor is a member who has taken more than three first awards since January 1972. And a "B" class exhibitor is a member who has taken less than three first awards. The idea is to encourage more members to show their fish at table shows. The results were as follow: "A" Class—A.V. Barb: 1 and 3, J. Salisbury; 2, Mr. and Mrs. Lee. Livebearer Pairs: 1, D. White; 2, 3 and 4, Master Colin Pratt. A.V. Loach: 1 and 2, J. Salisbury; 3, D. White. A.V. Rasbora: 1 and 3, D. White; 2 and 4, H. Salisbury. "B" Class—A.V. Barbs: 1 and 3, J. T. Dawson; 2, T. Allen; 4, Roy Shakespear. Livebearer (Pairs): 1, Mr. and Mrs. Carter; 2, T. Allen; 3 and 4, Roy Shakespear. A.V. Loach: 1, T. Allen; 2, Roy Shakespear; 3, T. Emms. A.V. Rasbora: 1 and 2, Kevin Pratt; 3 and 4, T. Allen.

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RESULTS of the **Dudley and District A.S.** May Table Show were as follow: Class B: 1 and 2, J. Goodman; 3, L. Hatfield; 4, W. Hickman. Class B Novice: 1 and 4, D. Price; 2, C. James; 3, R. Shakespeare. Class C: 1 and 4, W. Hickman; 2 and 3, J. Goodman. Class C Novice: 1, 2 and 3, R. Shakespeare; 4, Mrs. R. Hickman. Best Fish in Show: W. Hickman. The judge was F. Bolton of Lower Gornal.

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MORE than 500 fish were entered in a total of 30 classes at the **Weymouth and District A.S.** fourth Annual Show. Detailed results were as follow: Ad: 1, V. Worth (Weymouth); 2, D. Mulley (Weymouth); 3, J. Fancy (Weymouth). Ady: 1, D. Christopher (Dorchester). Bty: 1, A. Press (Bath); 2, P. Taylor (Weymouth); 3, D. and S. Jackson (Basingstoke); 4, J. Jackson (Weymouth). B: B. Bissoon (Basingstoke); 2, J. H. Jackson (Basingstoke); 3, R. Hart (Weymouth); 4, W. Woodbury (Exeter). C: 1, M. Medway (Weymouth); 2, Mrs. P. Carter (Weymouth); 3, R. Christopher (Dorchester); 4, R. E. Gale (Poole). D: 1 and 2, K. Forrester (Weymouth); 3, W. Woodbury (Exeter); 4, R. Daws (Cardiff). Da: 1, B. Bissoon (Basingstoke); 2 and 4, R. Christopher (Dorchester); 3, J. Edwards (Llantwit Major). Db: 1 and 3, B. Bissoon (Basingstoke); 2, C. Turner (Cardiff); 4, A. C. Tull (Salisbury). E: 1, B. Bissoon (Basingstoke); 2, J. Jackson (Basingstoke); 3, A. Worth (Weymouth); 4, A. C. Tull (Salisbury). Ea: 1, J. Morgan (Bournemouth); 2, K. Press (Bath); 3, T. Taylor (Basingstoke); 4, R. Christopher (Dorchester). G: 1, M. Cleall (Dorchester); 2 and 3, B. Jones (Basingstoke); 4, M. Medway (Weymouth). H: 1 and 2, D. Norman (Dorchester); 3, F. Orsman (Torbay); 4, K. Press (Bath). J: 1, R. Christopher (Dorchester); 2, Mr. Medway (Weymouth); 3, B. Bissoon (Basingstoke); 4, M. Cleall (Dorchester). K: 1, J. Jackson (Weymouth); 2 and 4, J. Edwards (Llantwit Major); 3, M. Cleall (Dorchester). L: 1, M. Fox (Dorchester); 2, R. Christopher (Dorchester); 3, B. Bissoon (Basingstoke); 4, J. Fancy (Weymouth). M: 1, J. Jackson (Weymouth); 2, A. Worth (Weymouth); 3, K. Press (Bath); 4, K. Forrester (Weymouth). N: 1, K. Forrester (Weymouth); 2, R. Christopher (Dorchester); 3, R. E. Gale (Poole); 4, G. and R. Fitzgerald (Weymouth). O: 1, J. Morgan (Bournemouth); 2, R. Christopher (Dorchester); 3, L. Bellamy (Poole); 4, K. Press (Bath). P: 1, K. Forrester (Weymouth); 2, S. Larcombe (Bath); 3, Mrs. M. Kelly (Weymouth); 4, R. Christopher (Dorchester). Q: 1, C. Turner (Cardiff); 2, B. Bissoon (Basingstoke); 3, E. Hunt (Yeovil); 4, C. Hunt (Yeovil). R: 1 and 4, C. Turner (Cardiff); 2, B. Bissoon (Basingstoke); 3, R. Onslow (Basingstoke). S: 1, R. E. Gale (Poole); 2, W. Woodbury (Exeter); 3, N. Taylor (Weymouth); 4, M. Trayes (Yate). T: 1 and 2, B. Bissoon (Basingstoke); 3, R. Onslow (Basingstoke). Uad: 1, M. Fox (Dorchester); 2, R. Onslow (Basingstoke); 3, R. Christopher (Dorchester); 4, V. Worth (Weymouth). Ubc: 1, K. Forrester (Weymouth); 2, R. Christopher (Dorechester); 3, R. Onslow (Basingstoke). V: R. Davis (Bath); 2, J. White (Weymouth); 3, G. White (Weymouth); 4, K. Forrester (Weymouth). W: 1 and 3, R. Christopher (Dorchester); 2, V. Worth (Weymouth). Xbt: 1 and 4, C. Turner (Cardiff); 2, M. Medway (Weymouth); 3, Mrs. P. Carter (Weymouth). Za: 1, J. Jackson (Weymouth); 2, K. Press (Bath); 3, N. Jennings (Southampton); 4, D. Kelly (Weymouth). Zb: 1, V. Worth (Weymouth); 2, K. Press (Bath). Ugliest Snail: 1, R. Onslow (Basingstoke); 2, B. Bissoon (Basingstoke); 3, V. Worth (Weymouth); 4, A. Worth (Weymouth).

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THERE was a good attendance at the May meeting of the **Gainsborough A.S.** The entertainment was provided by the members themselves. Mr. D. W. Gilding, "A" Class Judge, Y.A.A.S., F.N.A.S., gave a short lesson in judging fish and then invited everyone present to "have a go." The results were discussed at length and the experience should help members when purchasing fish or selecting fish for showing.

Table show results, judged by Mr. T. Allison, Retford, were: Rasboras: 1, 2 and 3, Mr. and Mrs. Gilding. Pair of Egglayers: 1, Mr. and Mrs. Harris; 2, Mr. and Mrs. Arrand; 3, Mr. and Mrs. Dixon. Furnished Jar: 1, Mr. and Mrs. Dixon; 2, Mr. and Mrs. Harris; 3, Mr. and Mrs. Spence. Juniors: Rasboras: 1, 2 and 3, G. Gilding. Pair of Egglayers: 1 and 2, G. Gilding; 3, P. O'Haloran. Furnished Jar: 1, G. Gilding.

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AT the April meeting of the **Bristol Tropical Fish Club,** members and visitors attended a lecture given by C. Craddock, his subject being "Home Aquaria." He was assisted by friends of the Keynsham Club.

The May meeting talk was given by H. Cotton on "Fish Diseases and Post Mortems." A table show for Mollies and Platies was held, the winners being: Open: K. Gray, Mollies, and Mrs. K. Martin, Platies. Novice: N. Gray, Mollies, and Miss M. Martin, Platies.

Prospective members please note that meetings are held on the third Thursday of the month at The Black Horse, Old Market, Bristol.

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THE **British Koi-Keepers' Society** will hold their third annual general meeting during the Aquarist Pondkeeper and Fishkeeping Exhibition at Alexandra Palace on Saturday, 14th July at 2.30 p.m. All are welcome, including non-members.

The Society has three hundred members nation-wide who receive regular Newsletters and are pleased to announce the formation of two local Sections. Full details of membership, subscriptions, regional activities, etc., can be obtained upon application (s.a.e. please) to The Secretary, Mrs. H. M. Allen, 1 Anthony Close, Peterborough, PE1 3XU.

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THE **Slough and District A.S.** held its second annual general meeting in May when the following officers were elected. Chairman: J. Jeedan; vice-chairman: K. Ferris; secretary: Mrs. Edith Knight, 52 Aldin Avenue South, Slough; show secretary: R. Knight; treasurer: B. Withers; committee: Angela Ferris, R. Winter, A. Kerr, D. Roberts.

The Honey Shield for the person gaining most points at table shows 1972/73 went to 14-year-old Robert J. Miles. The Best Fish 1972/73 award went to Mrs. Edith Knight. The next meeting will be held on Wednesday, 18th July, and new members will be very welcome. The meetings are held at Friends Meeting House, Ragstone Road, Slough, and begin at 7.30 p.m.

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AN interesting quiz between the **Harwich** and **Ipswich Aquatic Clubs** was held at Ipswich in May. The contest was close, but Ipswich pulled away in the later stages to win.

Two days later, the annual general meeting was held, and the following officers were elected: Chairman: L. Jermy; secretary: P. Auffret (4 Prospect Street, Ipswich); treasurer: Mrs. Hart; show secretary: K. Cocker; assistant secretary/news letter editor: D. Howard; public relations officer: A. Cook; Junior leader: V. Green; committee members: Mr. Thurlow and Mr. Hart. The meeting was followed by an informative slide show on "Furnishing an Aquarium."

Meetings are held on the second Monday of each month at the Central Conservative Club, St. Stephens Lane, Ipswich, at 8 p.m. Details from secretary. All welcome.

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THE **Yeovil and District A.S.** held their sixth open show in May, when the award for the best fish in the show went to D. S. Langdon, He also won the F.B.A.S. Championship Trophy for coldwater breeders. The best tropical award went to K. Forrester of the Weymouth Club and the best Junior award to Miss K. Rendell of the Yeovil Club.

Winners of the fish classes, for which there were over 400 entries, were: Barbs: 1, K. Forrester; 2, S. Bragg; 3, Master D. Earnshaw; 4, J. J. Edwards. Characins: 1, Mrs. P. Carter; 2, N. Fisher; 3, Mr. and Mrs. Medway; 4, H. Armitage. Cichlids: 1, K. Forrester; 2, C. Fiddock; 3, P. Gillam; 4, Miss D. Forward. Dwarf Cichlids: 1, A. Tull; 2 and 3, S. Bragg; 4, J. Dickinson. Labyrinths: 1, F. Orsman; 2, T. Mudge; 3, Mr. Ford; 4, C. Fiddock. Tooth-Carps: 1, F. Grant; 2, Mrs. M. J. Blofield; 3, N. Walker; 4, E. Orsman. Tropical Cats: 1, J. Dickinson; 2, Mr. and Mrs. Medway; 3, Master J. Edwards; 4, M. Poole. Corydoras/Brochias: 1, F. Orsman; 2, K. Taylor; 3, K. Forrester; 4, R. F. Adams. Rasboras: 1, Mr. and Mrs. Medway; 2, K. Forrester; 3, J. Stamp; 4, R. Gale. Danios/W.C.M.M.: 1, M. Cleall; 2, M. Ricketts; 3 and 4, A. E. Rendell. A.O.S. Egglayers: 1 and 2, Mr. and Mrs. Press; 3, A. Ettles; 4, B. Rixte. Pairs: R. Gale; 2, V. Collins; 3, N. Walker; 4, Mrs. S. Langdon. Guppy (Male): 1, S. Morgan; 2 and 3, Mrs. D. Booker; 4, S. Larcombe. Guppy (Female): 1, S. Larcombe; 2, R. Aslet. Swords: 1 and 3, Mrs. C. Hunt; 2, F. Orsman; 4, T. Hunt. Platies: 1 and 2, Miss K. Rendell; 3, Mrs. J. Griffiths; 4, S. Morgan. Mollies: 1 and 3, Mrs. J. Griffiths; 2 and 4, C. Fiddock. Goldfish: 1, Miss B. Hulbert; 2, J. Axe; 3, Miss K. Rendell; 4, Mrs. J. Heather. London Shubunkins: 1, Mrs. J. Griffiths; 2, Mrs. M. Ricketts; 3, C. Fiddock; 4, Mrs. J. Heather. Bristol Shubunkins: 1, 3 and 4, D. S. Langdon; 2, E. Taylor. Twintails: 1, 2 and 4, V. Collins; 3, F. Lange. A.O.S. Coldwater: 1 and 2, R. King; 3, A. E. Rendell; 4, S. L. Pearcy. Contrarchidae: 1, 2 and 4, V. Collins; 3, Master A. Emmonds. Breeders (Egglayers): 1, A. Tull; 2, M. Poole; 3, K. E. Taylor; 4, Mr. and Mrs. Medway. Breeders (Livebearers): 1, A. E. Rendell; 2 and 3, S. Morgan; 4, Mr. and Mrs. Press. Breeders (Coldwater): 1, D. S. Langdon; 2, V. Collins; 3, R. King; 4, J. Axe. Plants: 1, M. Fischer; 2, V. Collins; 3, F. Lange.

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THE **C.N.A.A.** second open show staged by the Rhondda Club was held in May. The number of entries was low and only 342 fish were benched. The F.B.A.S. judges who attended were D. Wigg, C. A. T. Brown, F. Tomkins, C. Lewis, F. G. James and S.

Langdon. The Best Fish in Show was won by C. Turner of Cardiff with a Platy, and the highest number of points went to Master Nigel Grey of Bristol. Full results were as follow: Class Adef: 1, T. Click. Class Ba: 1, 2 and 3, Master N. Grey; 4, J. Rice. Class Bz: 1, C. Turner; 2 and 3, Master N. Grey; 4, J. Rice. Class Ca: 1, R. Onslow; 2 and 3, C. Turner; 4, D. Scanlon. Class Cz: 1, J. Ciba; 2, K. Quenell; 3, C. Turner; equal 4, G. Hartry, R. Quenell, M. Strange. Class Da: 1 and 4, Master N. Grey; 2, J. Dankin; 3, R. Perkin. Class Db: 1 and 3, M. Strange; 2, D. Richards; 4, J. A. Thomsen. Class Dc: 1, C. E. Morrison. Class Dz: 1, M. Strange; 2, J. Rice; 3, Master N. Grey; 4, M. Williams. Class Ea: 1, C. Turner; 2, Master N. Grey; 3 and 4, R. Perkins. Class Ez: 1, Miss D. Jones; 2 and 3, P. Thomas; 4, A. Picton. Class F: 1 and 2, C. E. Morrison. Class G: 1 and 2, C. Harding; 3, Master N. Grey; 4, C. Harding. Class H: 1, 2 and 3, M. Quenell; 4, Master N. Grey. Class J: 1 and 2, C. Harding; 3, C. Phillipart; 4, C. Harding. Class K: 1, J. Edwards; 2, C. Turner; 3, D. Egan; 4, C. Turner. Class L: 1, M. Strange; 2 and 4, Master N. Grey; 3, C. Harding. Class M: 1, J. A. Thomson; 2, C. E. Morrison; 3, J. Edwards; 4, K. Quenell. Class Ma: 1 and 2, Master N. Grey; 3, C. Harding; 4, P. G. Thomsen. Class N: 1, C. Turner; 2, P. Thomas; 3, E. Oakley, C. Turner; 4, Master M. Thomas. Class Oe-Or: 1, C. Phillipart; 2, E. Oakley; 3, J. Rice; 4, W. Best. Class B-M: 1, C. Harding; 2, M. Strange; 3, D. Warmaent; 4, J. Egan. Class O-T: 1, M. Strange; 2 and 3, C. Harding; 4, C. Turner. Class Pa-Pl: 1, A. Picton; 2, W. Best; 3, J. A. Thomson; 4, Master B. Stallard. Class Q: 1, Master N. Grey; 2, D. Bimbling; 3, C. Turner; 4, R. Perkins. Class R: 1, 2 and 3, C. Turner; 4, C. Phillipart. Class Sa: 1, D. Scanlon; 2, J. Rice; 3, C. Harding; 4, Mr. and Mrs. C. Pass. Class Sz: 1, W. Best; 2, P. Lock; 3, J. A. Thomson; 4, T. Click. Class T: 1, Mrs. Strange; 2, R. Onslow; 3, M. Williams; 4, C. E. Morrison. Class Uab: 1 and 2, R. Rich; 3, D. Haymer; 4, Miss Carol Rupert. Class Ucd: 1, 2, 3 and 4, Miss Carol Rupert. Class V: 1, R. Rich; 2 and 3, Miss Carol Rupert; 4, R. Rich. Class W: 1 and 2, Miss Carol Rupert; 3, R. Rich. Class B-My: 1, Master K. Williams; 2 and 3, Master N. Grey; 4, G. Hartry. Class P-Ty: 1 and 2, Master N. Grey; 3, Master M. Thomas; 4, Master N. Grey.

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THE results of the **Brighton and Southern A.S.** monthly meeting were as follow: Livebearers (Sexed Pairs), 1, Black Mollies: H. Maddison. 2, Guppies: R. Rice. 3, Mollies Lyretail: V. Aldis. 4, Red-Eyed Red Swords: H. Maddison. Egg Layers (Sexed Pairs) Cherry Barbs: 1, V. Aldis. 2, Lerries: H. Maddison. 3, Golden Gouramis: H. Maddison. 4, White Clouds: R. Rice. The speaker for the evening was Jim Bertles from Mid-Sussex A.S. who provided a very entertaining evening at very short notice owing to the illness of the original speaker.

On the last Sunday in May half of the Society had a very enjoyable day at Portsmouth A.S., attending the usual well-organised Spring Bank Holiday Inter-club meeting. Brighton and Southern A.S. meet the first Monday of every month. New members are always welcome. For details please contact the secretary, S. Fork, 55 Newmarket Road, Brighton. Tel: 682037.

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THE **Bracknell A.S.** started April with their second annual closed show. The show was judged by A. Blake and the results were as follow: Class B: 1, L. Little. Class C: 1, L. Little; 2, J. Horsey; 3, Natalie Jordan. Class D: 1, L. Jordan; 2, V. Spong; 3, L. Little. Class E: 1, L. Little. Class F: 1, D. Jeffery; 2, J. Horsey. Class G: 1, Natalie Jordan. Class H: 1, E. Morgan. Class J: 1, V. Spong; 2, Mary Morgan; 3, D. Jeffrey. Class K: 1, D. Jeffery; 2, J. Horsey. Class M: L. Little; 2, D. Childs. Class O-P: 1, L. Jordan; 2, E. Morgan; 3, D. Jeffery. Class Q: 1, L. Jordan. Class R: 1 and 2, L. Little. Class S: 1, L. Little. Class T: 1, L. Little. Class U,V,W: 1, Master R. Little. Best fish in show award was won by V. Spong.

The second meeting of the month was a talk and slide show on fish photography by W. Wilson of Benson. The next meeting was a talk on breeding coldwater fish by 'A' class judge R. Esson.

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THE **Castleton A.S.** held their second annual presentation of awards in May. Following the awards, made by one of the judges G. Davies, there was a highly successful buffet and dance.

Competition results for the past 12 months were as follow: A.V.: 1, P. D. Burrow; 2, J. Chinn; 3, A. Calland. Specialist: 1, J. Chinn; 2, A. Calland; 3, K. Simpson. Junior section: 1, Miss A. Burrow; 2, Master P. Nightingale; 3, Master W. Johnson. Community tank: 1, Mrs. J. Ferrier; 2, J. Lingard; 3, K. Simpson. President's Award: K. Simpson.

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THE **Enfield A.S.** were hosts to the Essex and North London Aquatic Associations group meeting in May. A very interesting talk on fish diseases was given by R. List. Results of the table show are as follow: Fighters: 1, 2 and 4, G. Cope (Tottenham); 3, Miss Collins (Enfield). Labyrinths: 1, Mrs. S. Hedges (Bethnal Green); 2, Mrs. Twine (Walthamstow); 3, Miss Collins (Enfield); 4, Mr. Baulsom (Walthamstow). A.O.S.: 1, 3 and 4, Mrs. Hedges (Bethnal Green); 2, Mr. Stone (Leytonstone). The table show was judged by S. Cosel. The group next meet at Harrow Road Baptist Church, High Road, Leytonstone on 7th June. Enfield A.S. meet at St. Andrews Church Hall, Enfield Market Place on the third Thursday of every month at 8 p.m. New members and visitors always welcome.

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RESULTS of **Whiteway and District** Fishkeepers Society's first open show were as follow: Guppies: 1, W. Burton; 2, Master K. Daniels; 3 and 4, J. Wheeler. Mollies: 1, Mrs. B. Pederson; 2, T. Taylor; 3, J. D. Roberts; 4, R. Larcombe. Platies: 1, M. Eggas; 2, Mr. and Mrs. Press; 3, J. Ferguson; 4, J. Wheeler. Swordtails: 1, Mr. and Mrs. Press; 2, P. Greenwood; 3, D. Phippen; 4, F. Grogan. Specified Barbs: 1, A. Hilleard; 2, S. Bramgrove; 3, Master C. Larcombe; 4, Mr. Perry. A.O.V. Barbs: 1, A. Blake; 2 and 3, R. Hyett; 4, A. Hilleard. A.V. Characins: 1 and 4, A. Blake; 2, A. Hilleard; 3, R. Hyett. Fighters: 1, T. Taylor; 2, M. Eggas; 3, F. L. R. Fielding; 4, E. McQuade. Labyrinths: 1, L. B. Hodgkiss; 2, M. Daniels; 3, Master D. Sullivan; 4, G. Castle. Corydoras Catfish: 1 and 3, M. Mumford; 2, A. Blake; 4, Mr. and Mrs. Press. A.O.V. Catfish: 1, A. Blake; 2, A. Harmsworth; 3, Master K. Daniels; 4, Mr. and Mrs. Press. Sharks, Loaches, Botias and Eels: 1, A. Hilleard; 2, Master D. Sullivan; 3 and 4, Mr. and Mrs. Press. A.V. Cichlids: 1, R. Bennett; 2 and 3, D. Phippen; 4, Mrs. B. Pederson. Rasboras, Danios and Minnows: 1 and 4, A. Harmsworth; 2, A. Blake; 3, R. Hyett. A.O.V. Tropical: 1, A. Hilleard; 2, Mr. Heels; 3, Mrs. B. Pederson; 4, R. Larcombe. Breeders Livebearers: 1, M. Daniels; 2, J. Wheeler; 3 and 4, W. Burton. Breeders Egglayers: 1, Mrs. B. Pederson; 2, T. Tovey; 3, G. B. Todd; 4, L. B. Hodgkiss. Goldfish: 1 and 2, D. Phippen; 3, M. Butcher; 4, Master K. Daniels. Shubunkins: 1, 2, 3 and 4, G. Jennings. Fancy Goldfish: 1, 3 and 4, R. Davies; 2, Mr. Morris-Davies. Best Fish in Show: A. Hilleard.

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AT the May meeting of the **Brentwood A.S.** a fish and equipment auction was held. This proved to be a most enjoyable and at times humorous evening at which almost everyone came away with a bargain. New members are always welcome at the meetings. Please phone Upminster 27555 for details of the next meeting.

HOLDING their open show on a Sunday for the first time **Uxbridge A.S.** attracted 473 entries, in 27 classes. The judges were R. Esson, F. Tomkins, H. Towell, D. Ellis, E. Nicholl and M. Carter. Class winners were as follow:—Class Ad: 1, M. Goss. Class B: 1, L. Little; 2, B. Bissoon; 3, R. Leslie. Class Ba: 1 and 2, K. Smith; 3, A. Lusby. Class C: 1, C. J. Mears; 2, W. Bradford; 3, J. Batts. Class Ca: 1, B. Bissoon; 2, Mrs. D. Cruickshank; 3, E. C. Fantham. Class D: 1, Mrs. M. Nethersall; 2, R. Searls; 3, R. Ashworth. Class Db: 1, B. Bissoon; 2, L. J. Brazier; 3, R. Ashworth. Class E: 1, P. Coyle; 2, P. R. Saunders; 3, R. F. Rumney. Class F: 1, Mrs. G. Watts; 2, M. Collins; 3, Mrs. J. Garrad. Class G: 1, Mrs. M. Nethersall; 2, Mrs. P. Lambourne; 3, D. Lambourne. Class H: 1, T. Cruickshank; 2, R. G. Cox; 3, V. Valley. Class J: 1, T. Taylor; 2, D. M. Reilly; 3, R. Newman. Class K: 1, B. Bissoon; 2, R. Leslie; 3, Miss D. Longuet. Class L: 1, A. P. Taylor; 2, A. Lusby; 3, D. Stratford. Class M: 1, D. M. Reilly; 2, H. Mears; 3, A. P. Taylor. Class O: 1 and 3, R. Rogers; 2, A. P. Taylor. Class P: 1, B. Bissoon; 2, Mrs. G. Watts; 3, A. P. Taylor. Class Q: 1, P. Ginger; 2, J. Healey; 3, I. R. Pierce. Class R: 1, M. Strange; 2, H. Brouwers; 3, M. Chapman. Class S: 1, P. A. Moyle; 2, T. Taylor; 3, D. Lyne. Class T: 1, A. R. Chandler; 2, Mrs. R. A. Summers; 3, E. C. Fantham. Class U: 1, 2 and 3, F. Pinder. Class V: 1, 2 and 3, W. Bradford. Class Xb-m: 1 and 2, W. Bradford; 3, D. Lyne. Class Xo-t: 1, R. Newman; 2, P. Ginger; 3, R. Matthews. Class Z: 1, M. Goss; 2, A. R. Chandler; 3, H. Watts. Special Class: 1, R. Leslie; 2, B. Bissoon; 3, L. J. Brazier.

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AT the last meeting of the **Isle of Wight A.S.**, the cup winners for 1973 were announced to the many members present as follow: Points Challenge Cup: E. T. Davison. Best Tropical: B. Ford. Best Coldwater: K. Willis. Creepy Cup: F. Scovell. Characin Cup: R. Woodnutt. Novice Tropical: F. Scovell. Cichlid: G. Ford. Ladies' Cup: O. Davison and E. Ford. Plant Cup: F. Scovell. Hora Shield: E. Davison. Medals for 3 or more 1st cards: R. Woodnutt; E. Davison.

The highlight of the announcements was the nomination of the Champion of Champions for the Societies coveted top award which this year went to the secretary, E. Davison, whom the committee thanked for the tremendous effort over the last year for keeping the interest in the club at its peak.

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RESULTS of the **Corby and District A.S.** open show were: Class B: 1 and 3, D. Oakley (Dunstable); 2, Mr. Allen; 4, R. Shakespeare (Bedworth). Class C: 1, P. Moye (Bletchley); 2, W. Hickman (Dudley); 3, R. Elliot (Corby); 4, Mr. Pattison (Grantham). Class D: 1, I. Farrow (Dunmow); 2, C. Decruze (Dunmow); 3, D. Oakley (Dunstable); 4, K. Tillin (Kettering). Class Da: 1, Mrs. Page (Corby); 2, Mr. McInnes. Class Db: 1 and 2, W. Hickman (Dudley); 3, P. Moye (Bletchley); 4, M. Chapman (Basingstoke). Class Dc: 1, R. Walden (D.F.A.); 2 and 4, G. Dixon (Newbury); 3, D. Carnegie (Corby). Class E: 1, R. Marshall (Wellingborough); 2 and 4, E. Rossiter (Corby); 3, J. Salisbury (Bedworth). Class Ea: 1, J. Salisbury (Bedworth); 2, A. Thomas (Corby); 3, F. Vicker (E.L.A.P.A.); 4, D. Page (Corby). Class F: 1, P. Wallis (Wellingborough); 2, D. Page (Corby); 3, E. Holmes (Banbury); 4, D. Oakley (Dunstable). Class G: 1, P. Dellow (Corby); 2, D. Bitchenor (Wellingborough); 3, C. Pratt (Bedworth); 4, Mr. Neville (Grantham). Class H: 1, P. Moye (Bletchley); 2, D. Page (Corby); 3 and 4, R. Gillard (Dunstable). Class J: 1 and 2, D. Bitchenor (Wellingborough); 3, Mr. Crighton (Wellingborough); 4, W. Hickman (Dudley). Class K: 1 and 2, Ms. Allen; 3, P. Moye (Bletchley); 4, D. Bitchenor (Wellingborough). Class L: 1 and 4, J. Salisbury (Bedworth); 2, M. Chamber (Bletchley); 3, Mr. Allen. Class M: 1, Mr. Decruze (Dunmow); 2, R. Elliot (Corby); 3, E. Rossiter (Corby); 4, R. Hickman (Dudley). Class N.B.M.: 1, F. Vickers (E.L.A.P.A.); 2, Mr. Allen; 3, D. Carnegie (Corby); 4, Mr. McInnes. Class N.O.T.: 1, J. Short (Corby);

2, 3 and 4, Mr. Holmes (Banbury). Class O: 1, D. Bitchenor (Wellingborough); 2, E. Holmes (Banbury); 3, L. Hatfield (Dudley); 4, A. Crew (Wellingborough). Class Q: 1, D. Elliot (Corby); 2, D. Peers (Coventry); 3, J. Marsden (Corby); 4, R. Marshall (Northampton). Class R: 1, C. Pratt (Bedworth); 2, R. Onslow (Basingstoke); 3, Mr. Crighton (Wellingborough); 4, P. Moye (Bletchley). Class S: 1, Mr. Allen; 2, R. Marshall (Northampton); 3, R. Peers (Coventry); 4, C. Pratt (Bedworth). Class U: 1, D. Onslow (Basingstoke); 2, R. Shakespeare (Bedworth); 3 and 4, Mr. Allan. Class V: 1, R. Bentley (Wellingborough); 2, R. Shakespeare (Bedworth); 3, C. Cartwright (L.A.S.); 4, Mr. Giles (L.A.S.). Class X.O.T.: 1, F. Vickers (E.L.A.P.A.); 2, R. Matthews (Bletchley); 3, J. Marsden (Corby); 4, J. Allen (Bedworth). Class X.B.M.: 1, M. Strange (Basingstoke); 2 and 3, M. Pearson (E.L.A.P.A.); 4, P. Moye (Bletchley). The total number of exhibits was 432.

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MEETING for the first time at their new club room, members of the **Uxbridge and District A.S.** were greatly impressed by the better facilities at their disposal. A lecture on plants by Mr. Pye was well received as was a quiz organised by P. Ginger. An enjoyable evening was had with the Hendon club at their premises and Uxbridge won both the inter-club table show and a novelty quiz capably organised by K. Purbrick. For the second time this year High Wycombe beat Uxbridge in an inter-club table show. Members have been doing well at open shows, prizes being taken at Roehampton and Runnymede. Table shows are well supported, and it is hoped to stage further inter-club shows this year, coach outings and a social and dance. Address of New Club Room: Brookside Pavilion, Brookside Road, Hayes, Middx. Full details of club meetings and activities may be obtained from the secretary, B. Whitehead, 31 Berberis Walk, West Drayton, Middx.

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OWING to the resignation of several committee members of the **Wisbech and District A.S.** a new committee was elected on Wednesday 9th May, 1973, as follow: chairman: C. Edwards; treasurer, C. Hanley; secretary, J. Walsh, 62 Ollard Avenue, Wisbech PE13 3QW.

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THE May meeting of the **Weymouth A.S.** was well attended and after the arrangements for the open show had been arranged, the members were entertained by a talk on ponds and pondkeeping by the secretary, A. Worth. P. Carter of Preston Aquaria was voted unanimously as president of the society. Table show results Labyrinths A.O.S.: 1, R. Hart; 2, Mrs. V. Worth.

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A SLIDE show and quiz was given by Bernard Pye of Brentwood, at the May meeting of **Chelmsford A.S.** The winner of the quiz was C. French. The table show winners were: Mini tanks: 1, J. Henderson; 2, J. Newins; 3, C. French; 4, J. Smith. Plants: 1, D. Bannerman; 2, J. Smith; 3, G. Bannerman; 4, J. Henderson. The raffle was won by K. Turner and J. Smith.

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RESULTS of the **Port Talbot and District A.S.** open show were as follow: Class Ad: 1, R. Perkins (Port Talbot). Class B: 1, 2 and 3, W. Limbrick (Llantwit Major); 4, R. J. Hoare (Rhondda). Class Ba: 1, J. Rice (Port Talbot). Class C: 1, G. Hatry (Rhondda); 2 and 3, C. Harding (Cardiff); 4, J. Cilia (Barry). Class Ca: 1, R. J. Hoare (Rhondda); 2, J. Ilgan (Port Talbot); 3, V. R. Meek (Penarth); 4, J. Iliffe (Newport). Class Db: 1 and 2, J. A. Thomas (Llantwit Major); 3, W. Gibbon (Newport); 4, R. J. Hoare (Rhondda). Class Da: 1, M. J. Parkin (Swansea); 2, J. Edwards (Llantwit Major); 3, Master J. Edwards (Llantwit Major); 4, D. Egan (Port Talbot). Class D: 1 and 2, C. Morrison (Port Talbot); 3, J. Rice (Port Talbot); 4, A. Walters (Port Talbot). Class H: 1, C. Harding (Cardiff); 2, J. Cilia (Barry); 3, M. Fouracre (Port Talbot); 4, A. Picton (Rhondda). Class G: 1, W. Limbrick (Llantwit Major); 2, J. Rice (Port Talbot); 3, M. Fouracre (Port Talbot); 4, R. J. Daws (Cardiff). Class L: 1, R. J. Hoare (Rhondda); 2, K. Williams (Rhondda); 3, C. Harding (Cardiff); 4, C. Turner (Cardiff). Class J: 1 and 3, E. Earnshaw (Taunton); 2, R. J. Hoare (Rhondda); 4, C. Morrison (Port Talbot). Class K: 1, D. Egan (Port Talbot); 2 and 4, J. Edwards (Llantwit Major); 3, G. Castle (Trowbridge). Class F: 1, C. Morrison (Port Talbot); 2 and 4, M. Williams (Rhondda); 3, P. Jenkins (Port Talbot). Class Ea: 1 and 3, C. Turner (Cardiff); 2 and 4, R. Perkins (Port Talbot). Class O: 1, P. Phillpott (Swansea); 2, J. Rice (Port Talbot); 3, G. Castle (Trowbridge); 4, S. Burt (Rhondda). Class P: 1, A. Picton (Rhondda); 2, G. Castle (Trowbridge); 3, J. Parkin (Swansea); 4, J. Egan (Port Talbot). Class E: 1, G. Castle (Trowbridge); 2, J. Iliffe (Newport); 3, W. Gibbon (Newport); 4, P. G. Thomas (Swansea). Class Q: 1, P. Johnson (Port Talbot); 2, G. Berryman (Port Talbot); 3, D. Nichols (Port Talbot); 4, E. J. Ricci (Newport). Class R: 1, Mr. and Mrs. W. Johnson (Port Talbot); 2, G. Berryman (Port Talbot); 3, R. J. Hoare (Rhondda); 4, J. A. Thomsen (Llantwit Major). Class S: 1, C. Harding (Cardiff); 2, W. G. Best (Swansea); 3, J. Rice (Port Talbot); 4, Mr. and Mrs. W. Johnson (Port Talbot). Class M: 1 and 4, P. G. Thomas (Swansea); 2, Master J. Edwards (Llantwit Major); 3, C. Harding (Cardiff). Class T: 1 and 3, M. Williams (Rhondda); 2, C. Harding (Cardiff); 4, C. Morrison (Port Talbot). Class Xbtn: 1, J. Egan (Port Talbot); 2, 3 and 4, D. Warmeant (Cardiff). Class Xot: 1 and 3, C. Harding (Cardiff); 2, W. Gibbon (Newport); 4, M. Fouracre (Port Talbot). Class N: 1 and 2, C. Turner (Cardiff); 3, M. Williams (Rhondda); 4, R. Beale (Newport), G. Castle (Trowbridge). Class U: 1, Mr. and Mrs. W. Johnson (Port Talbot); 2, 3 and 4, Miss C. Rupert (Port Talbot). Class V: 1, 2 and 3, Miss C. Rupert (Port Talbot); 4, D. Warmeant (Cardiff). Class W: 1 and 2, Miss C. Rupert (Port Talbot); 3, Master J. Edwards (Llantwit Major). Best Fish in Show: E. Earnshaw (Taunton). Best Member's Fish: Mr. and Mrs. W. Johnson (Port Talbot) (Goldfish).

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AT the twenty-fifth annual general meeting of the **Goldfish Society of Great Britain** held in April, M. D. Cluse was re-elected president, G. W. Fleming was re-elected secretary (3, Rutland Road, London, E.11), M. Dudley re-elected assistant secretary. Other positions were: A. Lawman, public relations officer; H. Berger, show secretary; R. Whittington, re-elected Bulletin editor; D. Pearson, elected committee member. It was announced by G. Fleming at the May committee meeting that the Bristol A.S. have invited the G.S.G.B. to hold their Annual Convention at the Bristol open show. More details later.

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THE **Privateers A.S.** (Shipley), at its meeting in May, heard a very interesting lecture by J. S. Hall on Coldwater Fishkeeping and Breeding. The society will be moving to new premises at Shipley Carters Club, Stead Street, as and from 9th July. Meetings are held every second Monday in the month.

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ANNUAL show results of the **Yate and District A.S.** were as follow: Guppies (Male): 1, P. J. Greenwood (Bishops Cleeve); 2, G. G. Castle (Trowbridge); 3, A. Heels (Bishops Cleeve); 4, S. Burt (Rhondda). Guppies (Female): 1, P. Rossi (Bishops Cleeve); 2, A. Heels (Bishops Cleeve); 3, A. Click (Rhondda); 4, K. Press (Bath). Swordtails: 1, C. Turner (Cardiff); 2, D. Phippen (Bath); 3, C. Webb (Yate); 4, R. Larcombe (Bath). Mollies: 1 and 4, R. Larcombe (Bath); 2, D. Walsh (Yate); 3, M. Trayes (Yate). Platies: 1, R. Harvey (Keynsham); 2, P. J. Greenwood (Bishops Cleeve); 3, C. Webb (Yate); 4, C. Turner (Cardiff). Barbs: 1, R. Harvey (Keynsham); 2, G. Furber (Bristol); 3, G. Churchill (Yate); 4, P. Cotterill (Trowbridge). Barbs A.O.V.: 1, C. Russell (Bath); 2, S. Jeal (Independent); 3 and 4 R. Hyett (Yate). Danios, Rasboras and Minnows: 1 and 3, R. Hyett (Yate); 2, R. Harvey (Keynsham); 4, M. Butcher (Trowbridge). Characins: 1, R. Hyett (Yate); 2, B. Snell (Yate); 3, A. Hilleard (Bath); 4, G. Furber (Bristol). Characins A.O.V.: 1, R. Hyett (Yate); 2 and 3, R. Larcombe (Bath); 4, P. Wright (Yate). Anabantids: 1, G. Furber (Bristol); 2, B. Snell (Yate); 3 and 4, R. G. Lawrence (Bristol). Siamese Fighters: 1 and 2, K. Press (Bath); 3, R. Harvey (Keynsham); 4, C. Turner (Cardiff). Angels: 1, 2 and 4, T. Hamshire (Yate); 3, Mr. and Mrs. K. Press (Bath). Cichlids A.O.V.: 1, R. Lawrence (Bristol); 2 and 4, P. Wright (Yate); 3, R. J. Daws (Cardiff). Dwarf Cichlids: 1 and 4, R. Hyett (Yate); 2, P. Wright (Yate); 3, R. A. Bennett (Yate). Rift Valley: 1 and 2, B. Snell (Yate); 3, R. J. Davis (Cardiff); 4, P. Wright (Yate). Corydoras Brochis: 1, T. Fowler (Bath); 2, R. Hyett (Yate); 3, D. Richards (Rhondda); 4, T. Hamshire (Yate). Loaches, Eels, Botias: 1, A. Hilleard (Bath); 2, R. Lawrence (Bristol); 3 and 4, T. Hamshire (Yate). A.V. Sexed Pairs: 1, D. Phippen (Bath); 2, R. Harvey (Keynsham); 3, R. Larcombe (Bath); 4, T. Fowler (Bath). Breeders (Livebearers): 1, C. Turner (Cardiff). Breeders (Egglayers): 1, C. Turner (Cardiff); 2, B. Snell (Yate); 3, S. Green (Yate). Catfish A.O.V.: 1, J. Daws (Cardiff); 2, R. G. Lawrence (Bristol); 3 and 4, S. Green (Yate). Killifish: 1, 2, 3 and 4, W. G. Gadd (Independent). A.O.V. Tropical: 1, P. Wright (Yate); 2, A. Hilleard (Bath); 3, R. Lawrence (Bristol); 4, C. Russell (Bath). A.V. Rooted Tropical Plant: 1, P. J. Greenwood (Bishops Cleeve); 2, S. Burt (Rhondda); 3, M. Butcher (Trowbridge); 4, M. Ridge (Yate). Junior A.V. Fish: 1, O. Sullivan (Whiteways); 2, S. Burt (Rhondda); 3, J. Press (Bath); 4, B. Harris (Independent). Goldfish: 1, M. Butcher (Trowbridge); 2, T. Hampshire (Yate); 3, J. Powell (Yate); 4, D. Phippen (Bath). Shubunkins, Fancy Goldfish: 1 and 2, T. Fowler (Bath); 3, J. Willett (Yate); 4, L. Menhennet (New Forest). Pond and River Fish: 1 and 2, J. Powell (Yate); 3, M. Butcher (Trowbridge); 4, L. Menhennet (New Forest). Best Fish in Show: A. Hilleard (Bath). Highest No. points and highest No. points, Y.D.A.S. member: R. Hyett (Yate). Best Junior: Master B. Sullivan (Bath).

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THE **Jones and Shipman A.P.S., M.A.S.S., F.B.A.S.** has now been established for six months and would like to take the opportunity of thanking the following people who have helped over the last few months: The Jones and Shipman Sports and Social Club Central Committee; Leicester Aquarists; Leicester Fishkeepers; A. Pickering, and many more who have spared the time to help. At the April meeting the speaker was G. Dawson, who gave an excellent talk on his ideas of successful plant growth. The table show was Anabantoids and Cichlids, and the winners were: 1, M. Braimbridge; joint 2, B. Jeffs, J. Hassell and R. Reid. If anyone would like to offer the Society any help or advice, please contact M. D. Braimbridge, A. A. Jones and Shipman Limited, Narborough Road South, Leicester LE3 2LF.

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ONE of the members of the **Leytonstone and Stratford District A.S.**, Tony Coulavitch, gave the May meeting a demonstration and lecture of furnished aquaria. The Society has now a slide show with projector and operator for hire. The committee at its last meeting passed an addition that all O.A.Ps. should be admitted to the club at a reduced rate and it is hoped to encourage some of our Senior Citizens this way. All new members are welcome to the club which is held every Thursday at 8 p.m. at Harrow Green Baptist Church, Leytonstone.

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RESULTS of **The Trowbridge and District A. & P.S.** open show were as follow:— A.O.V. Barbs: 1, J. Almadi; 2 and 4, A. Hilleard; 3, R. Hyett. Barbs (Chequer, Cherry, Nigger, Rosy, Tiger): 1, R. Peck; 2, J. Edwards; 3, Beverley Hervin; 4, R. Bennett. A.O.V. Characins: 1, R. Lawrence; 2, A. Hilleard; 3, R.

Larcombe; 4, M. Pattrick. H. and H.: 1, R. Peck; 2, J. Roberts; 3, G. Hervin; 4, R. Onslow. A.O.V. Cichlids: 1, D. Noble; 2 and 3, B. Snell; 4, T. Tovey. Angels: 1, R. Clark; 2 and 4, Mr. and Mrs. Press; 3, J. Roberts. Apistogramma and Nannacara: 1 and 2, R. Bennett; 3, F. Gibbs; 4, R. Hyett. A.O.V. Labyrinths: 1, D. Calley; 2, G. Castle; 3, R. Lawrence; 4, D. Sullivan. Fighters: 1, J. Wheeler; 2, Mr. and Mrs. Press; 3, K. Daniels; 4, C. Turner. Killies: 1, J. Jackson; 2, G. Churchill; 3, R. Toose; 4, R. Peck. A.O.V. Catfish: 1, A. Walsh; 2, J. Jackson; 3, R. Lawrence; 4, R. Daws. Corydoras and Brochis: 1, G. Hervin; 2, M. Mumford; 3, R. Harvey; 4, Mr. and Mrs. Press. Rasboras: 1, R. Hyett; 2, A. Hilleard; 3 and 4, D. Noble. Danios and Minnows: 1 and 2, J. Edwards; 3, R. Peck; 4, Mrs. M. Butcher. Botia, Loaches, F/Foxes and Sharks: 1, A. Hilleard; 2, D. Nobel; 3, G. Hervin; 4, D. Sullivan. A.O.V. Tropical Fish: 1, R. Lawrence; 2 and 4, A. Hilleard; 3, G. Castle. Sexed Pairs: 1, C. Turner; 2, Mrs. Pedersen; 3, J. Wheeler; 4, R. Hyett. Guppy (male): 1, 2 and 4, J. Wheeler; 3, J. Ferguson. Guppy (female): 1 and 3, J. Wheeler; 2, A. Bebbington; 4, R. Wigg. Swordtail: 1, C. Turner; 2, W. Burton; 3, P. Greenwood; 4, C. Webb. Platy: 1, C. Turner; 2, J. Wheeler; 3, R. Lawrence; 4, R. Onslow. Mollies—Sailfin and Velifera: 1, Mrs. Pedersen; 2, D. Sullivan; 3, R. Larcombe; 4, J. Wheeler. Mollies A.O.V.: 1, 2 and 3, R. Bennett; 4, Mrs. M. Butcher. Common Goldfish: 1, C. Pearce; 2, A. Rendell; 3, Mr. and Mrs. Press; 4, J. Hulbert. Shubunkins: 1, G. Axe; 2 and 3, Mr. Jennings; 4, T. Fowler. A.O.V. Fancy Goldfish: 1 and 3, R. Davis; 2, R. Rich; 4, Miss D. Jackson. A.O.V. Coldwater: 1, A. Rendell; 2 and 4, C. Pearce; 3, G. Axe. Breeders (Egg-layers): 1, Mrs. Pedersen; 2, B. Snell; 3, C. Turner; 4, L. Menhennet. Breeders (Live-bearers): 1, Mr. and Mrs. Press; 2, C. Turner; 3, K. Daniels; 4, A. Rendell. Best Coldwater Fish in Show: G. Axe, with a Bristol Shubunkin. Best Tropical Fish and Best Fish in Show: D. Noble with a Pike Cichlid.

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SOME excellent guppies were on show at the April meeting of the **Manchester Section F.G.A.** and to prove how good his fish are, Alan Charlton took all the major awards, Best in Show, Best Male, Best Female and Best Breeders. Brian Harrison gave a very interesting talk on foods, both commercial and home made. The May meeting saw a very lively quiz between the Lancaster and Manchester members, which the Lancashire members won easily. The show bench was well supported with 58 entries, the major awards being, Best in Show and Best Female: J. Hesketh (Manchester). Best Male: J. Hutchings (Lancaster). Best Breeders: D. Glen (Manchester). All guppy enthusiasts are most welcome at any meeting held on the first Sunday of the month at the Longsight Hotel (rear entrance to Belle Vue), Manchester. Enquiries to the secretary, D. Glen, 16 Nuttall Avenue, Whitefield, Nr. Manchester.

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EARLY in May a highly successful evening was enjoyed by the **Dunmow and District A.S.** with a six-club table show and quiz. Those taking part were Chelmsford, Haverhill, Billericay, Harlow, Witham and Dunmow. The judge for the table show was Mr. Yates of Cambridge. There was a total of 81 fish and the results were as follow:—1, Mr. Cowley (Haverhill); 2, Mr. Henderson (Chelmsford); 3, Mr. Sutton (Chelmsford); 4, M. Green (Dunmow). The quiz was very successful. The results were as follow:—1, Chelmsford; 2, Haverhill; 3, Harlow; 4, Dunmow.

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AT the May meeting of the **Stevenage A.S.** a very interesting talk on Mollienisia was given by Mr. Morrice. The meetings are held at Bedwell Community Centre at 8 p.m. on the first Wednesday in the month.

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A SPECIAL attraction at the **Redcar A.S.** first open show at the Swan Hotel, High Street, Redcar, and donated by the founder-members will be £10 for the champion fish of the show. Also after the show a buffet dance will be held from 8 p.m. until midnight in the same Ballroom. Further details available from D. Nagle, 59 Charlotte Street, Redcar, Teesside. Open show date 7th October, 1973.

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SECOND open show results of the **Ilfracombe and District A.S.** are as follow—first prize-winners only:—Barbs: N. Gray (Bristol). A.O.V. Barbs: J. Bragg (Torbay). Cheiridory: J. Bragg (Torbay). A.O.V. Characins: Master N. Gray (Bristol). Angels: Master N. Gray (Bristol). Cichlids: R. S. Hoare (Harlech). A.O.V. Cichlids: O. J. Vickery (Ilfracombe) (Best in Show IDAS Trophy and Pin (Best Cichlid)). Siamese Fighters: C. Pidock (Exeter). A.O.V. Labyrinth: R. Wolf (Plymouth). Killies: J. Rundal (Plymouth). Catfish: Master N. Gray (Bristol). Corydoras: F. Oarsman (Torbay). Rasboras: E. Earnshaw (Taunton). Danios and Minnows: J. Edwards (Llantwit Major). Botia and Loach: R. F. Hoare (Harlech). A.O.V. Tropical: H. Gardner (Plymouth). Sexed Pairs: Master P. Richy (Ilfracombe). Guppy (male): W. Reid (Plymouth). Guppy (female): J. Bragg (Torbay). Swordtails: Master N. Gray (Bristol). Platies: J. Rundell (Plymouth). Mollies: J. Griffiths (Torbay). Common Goldfish: J. Davis (Torbay) (Best Coldwater Trophy). Shubunkins: C. Pidock (Exeter). A.O.V. Coldwater: J. Crowe (Ilfracombe). A.O.V. Fancy Coldwater: J. Webber (Plymouth). Egglayers Team 4: M. Poole (Torbay). Lurchars Team 4: Master N. Gray (Bristol). Individual Furnished: Mrs. Lay (Plymouth). Tropical Marine: L. Doubleday (B.M.A.A.). Coldwater Marine: Mrs. L. Doubleday (B.M.A.A.) (Best coldwater Marine Trophy). Best Fish by Junior Trophy: Master N. Gray (Bristol). Highest Points Trophy: Master N. Gray (Bristol). Best Junior Rasboras: Master K. Hancock (Ilfracombe). Total entries 400.

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THE Northern Section of **The British Koi-Keepers' Society** held its second meeting in March, when the subject of water-filtration in ponds was discussed. A series of coloured slides, provided by the Society chairman, E. Allen, were shown to illustrate pond-construction, under-gravel filtration and a Japanese water-changing system. Full details may be obtained from the Section. The British Koi-Keepers' Society, with a present membership of over 270, welcomes anyone interested in Koi keeping and it is hoped that a further local section will be formed in the Watford area. Membership details will be sent upon request to: The Secretary, Mrs. H. M. Allen, 1 Anthony Close, Peterborough, PE1 3XU. Tel. (0733) 67997.

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RECENTLY **GKN P. and A.S.** were host club to Wednesbury A.S. for the return match in the West Midland League. While the judges, R. Tedds and J. Goodman, were doing their task, the members of both clubs were entertained and kept busy and interested with a slide and quiz show presented by Mr. North of Pelsall A.S. who made it a very enjoyable evening. The results of the match with Wednesbury A.S. were: Rasbora: 1, N. Sours (G.K.N.); 2, T. Saunders (G.K.N.); 3, R. Hughes (Wednesbury). Anabantids: 1, J. Reeves (Wednesbury); 2, T. Saunders (G.K.N.); 3, N. Wale (Wednesbury). Cats: 1, T. Saunders (G.K.N.); 2, D. Penwright (G.K.N.); 3, J. Reeves (Wednesbury). A.O.V.: 1, R. Dawes (Wednesbury); 2, T. Saunders (G.K.N.); 3, K. Buxton (G.K.N.). This made G.K.N. P. and A.S. winners with 17 points to Wednesbury A.S. 11 points. The club's table show results were: Guppies: 1 and 3, T. Saunders; 2, D. Penwright). Livebearers: 1, G. Ceney; 2, T. Saunders; 3, D. Penwright. A.O.V.: 1, T. Saunders; 2, G. Ceney; 3, K. Buxton.

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THE **Bedworth Aquarist and Pool Society** would like to make a request for other societies to exchange copies of Newsletters. Please contact M. H. Carter, 1 Culworth Court, Foleshill, Coventry.

SECRETARY CHANGES

Barry A.S.: M. C. Guthrie, 4 Nurston Close, Rhoose, Glamorgan, CF6 9EF.

North Staffs A.S.: D. T. Cliff, 31 Bell Lane, Barlaston Park, Barlaston, Stoke-on-Trent, Staffs.

Southend, Leigh and District A.S.: Mrs. D. Chapman, 12 Waalwyk Drive, Canvey Island, Essex.

Brighton and Southern A.S.: S. Feek, 55 Newmarket Road, Brighton, Sussex. Tel: 682037. Show Secretary: A. Mepham, 11 Broomfield Drive, Mile Oak, Port Slade. Tel: 417847.

Cleveland A.S.: B. Welford, 1 Railway Terrace, North Skelton, Saltburn by the Sea, Yorkshire.

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NEW SOCIETIES

It is proposed to start a **Coldwater Society** specialising in the Oranda and Lion Head varieties of Goldfish. Aquarists keeping and breeding either variety are invited to write to: A. Lawman, 68 Gordon Road, Enfield, Middx. Phone 01-366 5945.

The first aquarist society ever formed in the town of **Buckie** recently commenced operations. The office bearers are as follow: President, F. Poppy; vice-president, J. Smith; secretary, J. S. Legge, 19 Milton Drive, Buckie; treasurer, R. Scott, and show secretary, G. Cowie. The committee consist of the above mentioned, Mrs. J. G. Smith, G. Dunn, R. Henderson and A. Robertson.

The club is to hold its monthly meetings and table shows on the first Wednesday of each month commencing in October in Room 3, of the Town House, Buckie. Anyone interested please contact the secretary.

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VENUE CHANGE

Weymouth A.S. The society's meetings will be held in future on the second Tuesday of the month at The Radcliffe Hall, Queen's Road, Radipole Spa, Weymouth.

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SHOW CANCELLATION

The **Riverside A.S.** regret that due to reasons beyond their control, the proposed open show has had to be cancelled.

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SHOW VENUE CHANGE

Ealing and District A.S. open show, new venue: Hanwell Community Centre. Show schedules: J. W. Batts, 99a Valetta Road, Acton, London, W.3.

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AQUARIST CALENDAR

1st July: Exeter and District A.S. Open Show. Further details later.

1st July: Chelmsley A.S. Open Show. Schedules and further information from show secretary, Mr. J. Aidney, 4 Shenton Walk, Kingshurst, Birmingham.

1st July: Mount Pleasant A.S. (revised date). Venue Saltwell Senior High School, Gateshead.

1st July: Glossop A.S. Annual Open Show.

1st July: Lytham A.S. Open Show at Lowther Pavilion, Lytham.

7th July: G.S.G.B. Quarterly Meeting. 2.30 p.m. Conway Hall, Red Lion Square, Holborn, London. Goldfish for Beginners' Part Three. R. Whittington. A talk by our Technical Director, J. Bundell. Feeding the Young Goldfish. Panel. Table Classes. Refreshments available.

7th July: Borehamwood & D.A.S. First Annual Aquascape and Furnished Aquaria Festival. Further information and schedules from D. J. Crucefix, 64 Milton Drive, Borehamwood, Herts, WD6 2BB.

7th-8th July: Dagenham Town Open Show, Central Park, Dagenham. Show schedules from show secretary, D. G. Kent, 74 Lynwood Drive, Collier Row, Romford, Essex, RM5 2QT. Tel: Romford 67804.

8th July: Grantham and District A.S. Fourth Open Show, at the Walton Girls County Secondary School, Kitty Briggs Lane, Grantham. Details from the show secretary, C. J. Shipman, 40, New Beacon Road, Grantham, Lincs. A "Y.A.A.S." Show.

6th July: Ashington Blyth and District A.S. Second Open Show to be held in Bebside and Cowpen Boys Club, Cowpen Road, Blyth. Details from Mr. G. P. Hunt, 9 Tyne Street, Ashington, Northumberland NE63 9HX.

14th-15th July: The Aquarist and Pondkeeper Fishkeeping Exhibition, Alexandra Palace, Wood Green, London, N.22.

15th July: The Sandgrounders' A.S. Third Annual Open Show, Meols Cop School, Southport, Lancs.

15th July: Billingham A.S. 3rd Annual Open Show, at Billingham Community Centre, Billingham Town Centre. Schedules available mid-May from: J. Attwell, 34 Hatfield Place, Peterlee, Co. Durham. Tel.: 4185; and A. Crossley, 32 Sledwick Road, Billingham.

22nd July: Runcorn A.S. Open Show is to be held in the Parish School Hall. Details from the Show Secretary, Mr. P. Hall, 26 Okell Street, Runcorn, Cheshire WA7 5AS.

29th July: Oldham & District A.S. Annual Open Show, at Werneth Park, Oldham. Schedules (when available from Show Secretary: E. Birchwood, 30 Inverness Avenue, Blackley, Manchester, 9.

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

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

6th-11th August: The Portsmouth A.S. Annual Open Show at St. Patrick's Hall, Winter Road, Southsea, Portsmouth. Setting up day will be Saturday 4th August, judging on the 5th. Show schedules are obtainable from J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, Hants.

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

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

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

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

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

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

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

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

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

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

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

26th August: Great Yarmouth and District A.S. Tropical Fish Exhibition 73. All welcome to exhibit at North Drive International High School. Details from P.R.O., P. Watson, 51 Common Road, Hemsby, Great Yarmouth, Norfolk.

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

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

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

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

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

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

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

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

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

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

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

14th-15th September: Bristol A.S. Open Show. All enquiries to E. N. Bowden, 12 Stoneleigh Walk, Knowle, Bristol, BS4 2R1.

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

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

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

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

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

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

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

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

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

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

22nd September: Littlehampton and Bognor A.S. Exhibition, Bognor Regis.

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

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

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

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

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

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

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

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

7th October: Elboracum Aquarists First Open Show. Further details available at a later date.

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

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

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

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

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

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

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

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

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