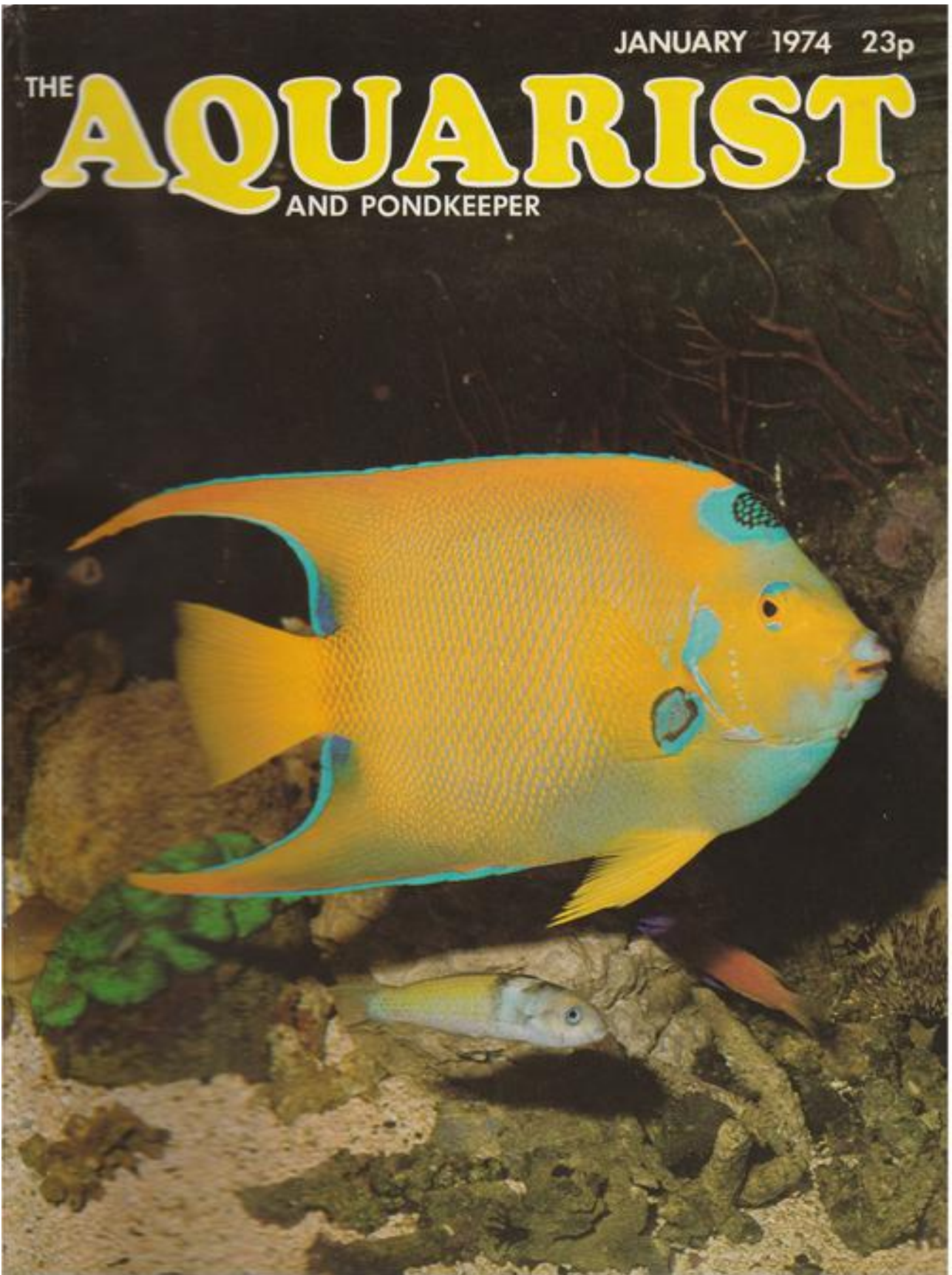


JANUARY 1974 23p

THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

Published Monthly 23p

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

Subscription Rates:
The Aquarist will be sent post
free for one year to any address
for £3.45 Half-yearly £1.72

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

Founded 1924
as "The Amateur Aquarist"
Vol. XXXVIII No. 10, 1974

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

Our Cover
Anguillidontichthys ciliaris
Courtesy of WATER
LIFE RESEARCH LTD.

Contents

| | PAGE |
|---|------|
| What is Your Opinion ? | 370 |
| Marine Queries | 375 |
| Rearing <i>Tealia coriacea</i> | 377 |
| Our Readers Write | 379 |
| From a Naturalist's Notebook | 382 |
| Product Review and What am I ? | 383 |
| Our Experts Answer: Coldwater Queries | 384 |
| Tropical Queries | 385 |
| The Uruguayan Characin | 387 |
| Furnishing Aquaria for African Mouthbrooders | 388 |
| Why Not Specialise in Lobsters ? | 392 |
| Junior Aquarist: The Hardy European Reptiles and Amphibians | 396 |
| The Water-Vole | 399 |
| Piranhas | 401 |
| The Garden Pond in Winter | 403 |
| News from Aquarists' Societies | 405 |

The Editor accepts no responsibility for views expressed by contributors.

WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author



HAPPY NEW YEAR! I hope your plants and fishes flourish in 1974 and that you will send me details of some of your interesting experiences. The first of this year's letters comes from the Hon. Secretary of Barry Aquarist Society, Mr. M. Guthen, of 4 Nurston Close, Rhoose, Glam., CF6 9EF. He writes: "As a constant reader of 'The Aquarist' I consider it a balanced magazine between features and advertisements, both of which I enjoy reading. I feel a welcome introduction would be a pull-out page, headed with a photograph of a fish or plant species, together with the following information: species; habitat; size; male and female characteristics; breeding conditions; pH; hardness; etc. All such pages could be collected and made into a comprehensive book which would be invaluable if kept up to date with the new species constantly entering the country and seemingly putting our books out of date. I would like your and readers' comments." (I think it is quite a good idea although, as you may know, it has been used by an American magazine. As there are many thousands of species of fishes and plants, it would take many decades to cover them at a rate of one per month.)

It's quite some time since I last heard from Mr. S. Fox, whose home is at 126 West Farm Avenue, Longbenton, Newcastle upon Tyne, NE12 8RU. In his latest letter he writes: "Mr. Prior's problem (July 1973 edition) of leaf loss when introducing *Cryptocoryne* plants into a newly set up aquarium is a fairly common one. When the plants are placed into 'alien' water conditions they react by shedding their leaves. Invariably, as Mr. Prior has observed, once these plants have become adjusted to the new water conditions the plants will put out new leaves and resume normal growth. However, I would not discount other factors that often contribute to leaf loss from aquatic plants, especially so if this should occur in an established aquarium—although in Mr. Prior's case I would contend that water conditions were not favourable, and were therefore the prime cause of leaf loss. *Cryptocorynes* that are doing so badly that their growth appears to be at a standstill can often be induced into renewed growth by moving them to a new location within the same aquarium. In many instances a move of only two or three inches will suffice. Try it!—and try to arrange that the

plants' leaves are at least approximately aligned or pointed in the same direction as they were in their former location.

"Mr. Parker is of course correct when he states that *Cryptocorynes* that have grown in the littoral phase—partly emersed above the water surface—will lose their leaves when suddenly and completely submerged into a normal aquarium—aquatic phase. However, I do not agree that lime—calcium carbonate—present in aquarium water is of any advantage in promoting healthy conditions in which aquatic plants will safely grow. Calcium carbonate should be kept out of aquaria and not deliberately introduced. I wonder why 3/16 in. gravel size was specifically recommended by Mr. Parker?" (I would certainly agree that calcium carbonate, in any solid form—e.g. limestone, shells, coral, bones, etc.—should be kept out of freshwater tanks unless one's aim is to provide very hard water for some particular purpose).

When I recently completed my university examinations for 1973, I decided to relax by reading a novel by my favourite author, Thomas Hardy. My choice was "A Pair of Blue Eyes," which was first published in 1873—exactly 100 years ago—and I was interested to read that one of the characters in the novel, the rector, kept "... a marine aquarium in the window..." of his study. It is an enlightening piece of information for those of us who tended to think that marine aquaria were relatively recent introductions!

Mr. J. Luke lives at 41 Mellington Avenue, East Disbury, Manchester, M20 0WE, and he writes: "The most efficient make of 'vacuum cleaner' that I've come across—and I've tried a few!—is the Nuova Perfectus. I bought mine approximately two years ago and am still using it. It cost about £1.00 then but I believe it is now about £1.40. It is, no doubt, an expensive item, but as a lover of Oscars and tinfoliis it has been worth every penny. I run mine off a Rena 100 pump, which gives a remarkable cleaning action. I find that the bottom of the air-lift, unlike many, is wide enough to prevent small pebbles from sticking in the tube. All sediment is collected in a removable bag from which one simply washes out the 'muck'. It also has an extended tube above the bag to prevent splash back. The stem is telescopic and can be used at different depths. The most effective algae remover I have used is a half sponge/half pan

scourer block. The largest fish I have ever kept is my 4 years old tinfoil barb. It is about 8 in. long and 4 in. deep, is very tame, and eats almost anything from my hand. Cheshire cheese is its favourite food! Its basic diet is Phillips Maxiflake, with maggots, cooked meat, earthworms and peas to add some variety. One original tip, I think, that might be useful to other aquarists, concerns the use of charcoal in external filters. I put mine in the foot of an old pair of my wife's tights. The water filters through with ease, without loose, wet charcoal all over the place." Mr. Luke ends his letter by saying: "Please accept my sympathies on the loss of Tojo," (Thank you. Although I'll not have to worry about tortoises and hibernation this year, I would be interested to hear of the dates on which readers' tortoises hibernated last year).

If I remember correctly, in last month's edition I told of how my angelfish had spawned four times in as many weeks. The pair spawned a fifth time and carefully guarded their eggs and later their fry until they had about one hundred babies swimming round them. I removed about half of the fry to a separate tank in an attempt to rear them; but none survived more than one day. The babies left with the parents in the community tank survived for a few days longer, but when individual fry strayed from the parents they had a very difficult task in trying to return them to the main batch. In the end the task became too much for them and all the fry disappeared. No doubt they were eaten by the other occupants of the tank. During the hatching process the adults moved the babies round a series of several leaves of Amazon sword. I'm still convinced that extra light has been encouraging the pair to spawn and hope to provide the adults with a tank of their own if the spawning spate continues. Another of my recent experiences may be of interest to you. In the same community tank is a second Amazon sword plant; recently it was getting so large that I decided to remove some of the older leaves to let more light get to the shorter plants in the tank. A few days after doing so the large sword plant produced a strong flower/plantlet stem and this is now producing new sword plants. So if you have a large Amazon sword which has not produced any new plants recently, you might care to try pruning it. If you do, let me know if it produces any new plantlets as a result.

A couple of my smaller tanks having developed tiny leaks in the past few months, I recently decided to clear them out and seal them inside with a silicone rubber sealant. I must admit that I was more than a little surprised when I bought a large and a small tube of sealant. The former cost £1.07 for 75cc. and the latter 81p for an unspecified quantity. Of the two, I found that the smaller tube contained the better sealant (they were different brands) but both quantities

seemed to be very small for the very high cost. Perhaps some manufacturer of silicone rubber sealant for use by aquarists could tell us why the product is so expensive—in my eyes anyway. I know that the acetic acid content can bring tears to one's eyes—but so could the price! Would any manufacturer care to comment—without blaming V.A.T.?

While cleaning the gravel from the two tanks that were being sealed I was amazed to find many pieces of lead which I had used, over the years, to weigh down plants. They had obviously got disengaged from plants' roots and stems and had found their way deep into the gravel. As most readers will know, lead can be poisonous to animal life—including humans—and although it is not affected to any extent in hard water, it is slightly soluble in soft water. Thus, if you are setting up a tank containing soft water for some particular species of fish I would suggest that you exclude lead weights and try to anchor the plants using gravel or small stones only. If you have been using lead weights on plants in a given aquarium over an extended period, it might be worth your while to search through the gravel with your hands to discover if there are any pieces of lead which are not serving any useful purpose by holding plants in place. If there are, I suggest that you remove them as they could be damaging fishes' health.

On the subject of actual tanks, I would be interested to hear (a) for how many years have you had a successful tank operating *without* a complete clear out? and (b) for how long have you had any single tank frame in continual use? My "best value" tank is the first one I ever got; it was bought for me by my father well over twenty years ago when I was a child. The tank has an aluminium alloy frame and the frame is almost as good today as when it was bought. A very rare coat of paint is all that the frame has required—and the reasons have always been aesthetic. More recently acquired angle iron tanks, although still in use, have lost their aesthetic appeal through the ravages of rust.

Mr. D. Richards, whose home is called "Green-roofs", resides at Newport Road, St. Mellons, Cardiff, Glam., and being 78 years old he must be one of our oldest readers. He has become very interested in keeping tropical fishes, and gleans as much information as possible from 'The Aquarist'. But unfortunately Mr. Richards is unable to get out and about to visit shops or other aquarists' homes. To "keep in touch" with the hobby he would like to correspond with other aquarists. So far he has written to a couple of readers whose names and addresses appeared in previous editions of 'The Aquarist', and although he enclosed a S.A.E. on each occasion he did not receive any replies to his letters. As a result he writes: "I have lost faith in the people who keep tropical fishes as I thought I could find someone who would help me.

Up to the moment I have failed." Would anyone care to write to Mr. Richards? He has a 36 in. tank, complete with Algarde U/G filter and 2 angelfish, 1 catfish, 1 black moor, 1 albino catfish, 1 kissing gourami, 2 black mollies, 3 swordtails, 2 platies, 2 beacons, 1 fantail and 2 scissor-tails. Mr. Richards will refund the postage costs of anyone who is kind enough to write to him.

Since beginning this month's feature I've received two more letters from Mr. S. Fox. On the subject of Gro-Lux lighting he has the following to say: "There appear to be conflicting opinions among aquarists who have installed Gro-Lux lighting on their aquaria. First we have those who condemn it as they say that it seems to encourage the growth of *algae* in their tanks. Second we have those who contend that *algae* growth is inhibited. We have also those who vow that aquatic plants grow at a prolific rate; yet there are others who state that plant growth is retarded. There seems to be a considerable number of aquarists who have Gro-Lux installed who have found it expedient to supplement this by installing tungsten lighting. It seems to give the strong impression that such aquarists seem to lack confidence in Gro-Lux light if they add tungsten lighting. The main claim to virtue of Gro-Lux light is that it enhances the colours of fishes and plants. This is achieved by this type of light emphasising the blue and red colour bands of the spectrum, while there is only a weak emission of white light. It would seem that aesthetic values have priority and therefore greatly influence aquarists to install Gro-Lux.

"For many natural reasons fishes and plants need the full spectrum of light; therefore I would contend that Gro-Lux lighting is unsuitable for that reason, and that tungsten light comes closest to providing the right value or quality of light required by plants and fishes." Mr. Fox continues: "In apparent defence of Gro-Lux light, *algae* growth is largely inhibited when it has to compete with the higher forms of plant life for food materials; when higher plants are not present in sufficient numbers in the aquarium then *algae* do not have to compete for food. The quality or chemistry of water will also play its part in whether or not *algae* become the dominant forms of plant life in the aquarium. It is not always appreciated that aquatic plants' light requirements vary somewhat, according to species; therefore it is not an uncommon sight to see plants that are retarded, plants that are elongated—the elongation sometimes being mistaken for good growth—and plants that are bent towards frontal lighting, all existing in one tank together. It can be truly said here that the plants are deformed through being subjected to incorrect lighting values. Normally a fluorescent tube should be replaced after 2,000 hours, or two years, of use, whichever comes first. After this period, if the tube is still in use there

will be a gradual fall off in light intensity, though this is not readily apparent to the eye. As a general guide to renewal, when the ends of the tube turn black then it should be replaced by a new one. The longer a tube is used past its normal life span the greater the danger of the control unit becoming overheated, causing possible premature failure of the unit and necessitating expensive renewal. To over-use a tube is false economy!" Mr. Fox concludes his second letter by replying to my recent query about a plant that was sold to me under the name of *Heteranfolia variegata*. He writes: "In reference to the plant . . . I have not heard of any aquatic plant so named. Could it possibly be *Alternanthera sessilis*? This is the only plant that I know of that seems to fit your description." (It's not *Alternanthera*, and I still have been unable to identify it. Do any others know, or think they could suggest, what the plant might be, please?).

My angelfish saga continues: last night the pair spawned for the sixth time, the spawn being deposited this time on two adjacent Amazon sword leaves. As there were eggs on two leaves I decided today to remove the leaf with the larger number of eggs and place it in an 18 in. tank, complete with diffuser stone, to attempt to hatch one batch of eggs away from the parents. While removing the leaf I had my hand attacked several times by the adult angels; however it was painless. Although I had pangs of conscience about distressing the parent fish by removing one leaf covered with their eggs, the fact that they had a leaf left complete with eggs lessened their distress—and mine. The adults are now carefully guarding their remaining eggs and I'm attempting to look after the others. I suspect that the fish will do a much better job than I will!

The next letter reached me as a result of my having recently published a letter by a reader who lives in Eire. The more recent of the two letters comes from Mr. A. Fullagar, of Cobh Aquatics, Glebe View Lodge, Tay Road, Cobh, Co. Cork, Eire, and he writes: "After reading your articles for some considerable time, we have on occasions been tempted to write to you regarding some of the letters that you print. Up to now the temptation has been resisted for the reason that we feel that traders should keep their opinions and semi-free advertising out of columns like yours." (If a dealer or manufacturer has something interesting to say, I'm always pleased to include his views. Without dealers and manufacturers there would be very few hobbyists. Unlike some other publishers, the publishers of *The Aquarist* do not manufacture or sell aquatic goods, hence editorial pages are not cluttered with personalities or products "on sale" by the publishers. One of the things that I personally admire about the magazine is that you and I are free to mention any product by name. If one of us uses, and is pleased with, a particular product, then I feel

that it can only be of benefit to the hobby if we tell others about it.) Mr. Fullagar continues: "But the comments of Mr. Hughes, of Dublin, need a wee bit of clarification. We grant that the price of a zebra at 25p is unusually steep, even for here, but to be fair to the trade in Eire, he is badly penalized by taxation and red tape here compared with his counterpart in England. On top of carriage costs of 24p per kilo, he has to pay approximately £8.00 per consignment for handling charges, both English and Irish. This is added to the price of the fish he has bought, and a duty of 8% is added. This is all added up and a VAT charge of 6.75% is added to the total. As you can imagine, the resultant total can be quite staggering. One batch alone that we imported from England some time ago came to 135% again of the price paid

U.K., or any other dealers in Eire, care to comment on the "components" that go to make up the final retail cost of fishes?)

It's two years since I last received a letter from Mr. J. Cheese, who lives at Redbrook Farm, Redbrook Street, Woodchurch, Ashford, Kent, TN26 3QS. Since then he has started work and has had more money to spend on his hobby. Having bred the commoner live-bearers such as platies, Mr. Cheese decided to move on to the egg-layers, starting with dwarf gouramies. (Photograph 1 shows a male fish.) His dwarf gouramies were kept in a community tank but the male fish died; its replacement did not get on well with the female and shortly afterwards, despite salt treatment, both fish died from some kind of dropsy. Mr. Cheese next tried breeding a pair of pearl goura-



in England. This is why the price of fish here is much higher than in England.

"The second thing that rather upset us is the reference that plants are very difficult to get here! Once again, Ireland has strict rules regarding the importation of any plants, and certain licences are rather awkward to obtain; but they can be obtained. In our case we keep a constant selection of over 25 varieties of plants here, with the common plants at 6p each, or 50p for 10. As a plug we would like to mention that we have over 100 stock aquariums, and also keep somewhere in the region of 180 varieties of fish. Some fish that we sell are on a par with England: small neons at 16p, or 7 for £1.00." Mr. Fullagar ends his letter by saying: "If Mr. Hughes does get his projected fish house going we hope that he will contact us as we would be very interested in buying, in any quantity, from him. Hoping that this may clear up a few things." (Would any dealers in the

mies. The fish were placed in an 18 in. tank, water temperature 78-80°F, with a dense surface covering of Riccia. Oak tree roots were placed in the water so that they just poked out of the surface of the half filled tank; Mr. Cheese's aim was to "keep the air humid." The male fish started to attack the female as soon as they were placed in the tank, so an internal divider was fitted in the tank. It was arranged such that the fish could get from one side to the other, but it saved the female from getting "beaten up" too much. Mr. Cheese's male is about 4½ in. long; it has long, flowing fins and regular, similar sized white dots over most of the body and fins; the edges of the dorsal and anal fins are fringed; the feeler like ventral fins are orange in colour. The throat of the fish is "a lovely, strawberry jam red"; the female is quite drab when compared with the male. I'll let Mr. Cheese continue with the story. "Two weeks after I bought the fish, the male began to build a small nest. Next morning

the female was in the same side as the male and looking rather ragged. Over the next week the male built several such nests, all of which broke up. About a week later I spotted a baby fish in the tank, and when I looked around I counted six babies; later I saw another smaller baby. It is interesting to note that the male did not chase the babies but the female did. After two months with the parents even the male chased the babies—which were then about $\frac{1}{4}$ - $\frac{1}{2}$ in. in length. I sold four of the young fish to a colleague at work and kept three in my community tank where they settled down well. At the moment the male is building some more nests and it looks as if the adults may breed again soon." Mr. Cheese ends by saying: "There is only one improvement I would like to see in 'The Aquarist' and that is coloured plates illustrating articles; but I know how expensive these would probably be."

We move on now from a letter from Mr. Cheese to a letter from Mr. Cheeseman—Mr. P. C. Cheeseman to be exact, and he lives at 47 Teagues Crescent, Plot 12, Trench, Telford, Shropshire, TF2 6RF. He writes: "'The Aquarist and Pondkeeper' is undoubtedly the best turned out magazine in the country for our hobby, but one useful addition mentioned in your column before would be an index on articles at the end of each year. On the subject of removing algae from the glass of aquaria, I think that the best method is the use of 'the razor-blade on a stick.' It is quick and totally effective as long as the razor-blade has a keen edge. Only use a given blade three or four times to avoid scratching the glass, and take care if a silicone rubber sealant has been used in the tank." (Personally, I still find the razor-blade quicker, easier and more effective than any other method—including pot-scrubbers and magnetic cleaners. As Mr. Cheeseman says, it's important to avoid damaging any silicone rubber sealant used in a tank!) Mr. Cheeseman continues: "The only use I have for snails is in tanks for rearing fry. Here the snails will eat all excess food, and it is said that their droppings help to promote infusoria. One or two *Ampullaria* snails are all that are required."

"The largest fish I have kept were a pair of Rift Lake Cichlids—*Melanochromis vermicerosus*. They are very interesting fish. Unfortunately I had to sell them before I moved house. The following tip may be of use to those breeding live-bearers. An easy way to protect newly-born live-bearers is to float a covering of plastic, practice golf balls on the water surface. The whole ball floats just below the surface, giving a 'Swiss cheese' effect with many hiding places. The main advantages of this method are that the balls are easy to use and can be used over and over again. Finally, I would like to say how sorry I was to hear of the passing on of your faithful tortoise Tojo. His presence on your pages always added interest and

variety." (Of the tips received for my little Christmas competition I think that Mr. Cheeseman's golf ball tip is the most original; thus I've decided to award him the prize. I will be posting off a filter and some fish foods to him and they should reach him well before Christmas. I hope they are of use to him as he recently moved house and is now setting up his first tank in his new home.)

My request for information about readers' breeding experiences with neon tetras brought only one reply. Does this mean that none of the readers of this feature has successfully bred the neon?—or have they just not had time to write? If you have any experiences to relate, please let me have them. The letter I did receive comes from Mrs. V. G. Houps, of 30 Somerset Road, Cheriton, Folkestone, Kent. Mrs. Houps writes: "After a six year lapse I decided to set up a



24 in. community tank 'for the children.' For 'starters' I bought two angels, two neons and the ubiquitous pair of guppies. I have subsequently added about seven or eight small fishes, all these fish being fed mainly on Tetramin, with only occasional *Daphnia*, white worms, minced meat, etc. All are thriving. I was utterly amazed therefore to find the neons spawning in one corner of the tank today. Needless to say the eggs went the way of all eggs in a community tank, but I felt that I had to write and tell you of this since from all that I have read and heard they are very difficult fish to spawn. The water is about 80% filtered and boiled rain water—from the greenhouse roof water-butt!—and 20% tap water. I am of course fired with enthusiasm not to be caught napping if there is a 'next time,' and will attempt to fix them a small tank of their own. Although I have several good books on tropical fish, with breeding information, I can find no indication of the frequency of spawning. Can you help with this problem, please? May I also offer a small 'tip' which may be well known, but which I discovered by myself?

Continued on page 381



MARINE QUERIES

by Graham F. Cox

I have been keeping coralfishes for approximately 18 months with quite good success. My fish are as follow:—

- Five *Dascyllus trimaculatus* (Domino Damsel)
One *Pomacentrus melanochir* (Saffron-Blue Damsel)
One *Dascyllus aruanus* (Humbug Damsel)
One *Chelmon rostratus* (Copperband Butterfly)

One *Chaetodon larvatus*

These are housed in a 5 ft. × 18 in. × 18 in. all-glass aquarium powered by a U/G filter giving approximately 250 galls/hr turnover. After displacement by 90 lb.wt. white silica gravel, some limestone pieces cemented together and various pieces of coral, the tank holds 44 gallons of synthetic sea water.

I have recently had trouble with copepods and have used, to success, the medication STERAZIN. I would point out that the treatment was suspended after the fifth day as the fishes had stopped eating and the two Butterflies were showing signs of distress. I had noticed, anyway, that the copepods were dead or dying on the first day of treatment which was fourteen days ago from the date of this letter. The fishes resumed feeding normally after three to six days.

There is no danger of my losing the fishes, but I am at a loss as to why they are acting as follows:—

- (1) Butterflies Twitching of ventral fins and sudden bursts of speed coupled with slight colour variations 3-4 times daily.
- (2) Damsels Fishes close ventral fins tight to their bodies, turn onto their sides and then come back onto a normal keel.
- (3) All fishes Occasional scratching and twitching.

These symptoms were, I thought, classically those of copepod infestation. I have seen, however, whilst looking for copepods, small, free-swimming white, worm-like creatures approximately 1/32 in. long. These seem to be constantly wriggling. Could these be the cause of the trouble as I'm pretty sure it is not caused by Oodinium disease since all the fishes are breathing at your advised normal respiratory-rate of 80 gill-beats/min. I have checked my nitrite, pH and density reading and all seems normal.

ANSWER

Your question is particularly valuable since it highlights the greatest single impediment in the path of the "young" marine hobby at this point in time—**NAMELY the COPEPOD and FLUKE problem.**

Almost every incidence of this problem which I have personally investigated in the last three years has contained in common several of the factors listed below:—

- (a) The sea aquarium is *nearly always* old-established and contains massive amounts of "Sea-humus" in the gravel filter-bed. Readers of recent marine queries will remember that sea-humus is the name I have given to this fawn-grey accumulation of bacterially-resistant, non-biodegradable organic detritus which slowly builds up in the gravel of a filter-bed which hasn't been periodically washed and flushed clean.
- (b) The marine aquarium-keeper responsible for the tank feeds large regular amounts of some North-Sea derived food such as unsterilized mussel-flesh, Mysis shrimps, un-boiled prawns or shrimps, frozen plankton, etc., etc.
- (c) Where (a) above is not the case, the maturation of the base filter has been accelerated by the introduction of bacterially-matured gravel and sea-humus from a friend's tank.
- (d) Natural seawater has been collected and used for

- the tank without first storing it in glass vessels in the dark for 6-12 months.
- (e) Some native marine animals and or refuge/decor materials from our coastline have been introduced.
 - (f) Fishes have been purchased hurriedly and/or before they had been given a full-course of anti-fluke, anti-copepod medication by the importer, and the retail shop-keeper, and may thus have been infested with these ectoparasites *already* at the time of purchase.

In extreme cases one could even detect that particularly unlucky hobbyists had succeeded in combining *all* the above factors a-f inclusive in the same unhappy tank.

I feel quite confident in diagnosing your problem as a result of the excellent data and history which you have furnished. The STERAZIN medication destroyed all generations of copepods within your system. Unfortunately, however, because you terminated the course of treatment prematurely, some monogenetic trematode flukes survived the four day medication period in the egg stage (*N.B.* STERAZIN is quite unable to destroy either copepods or flukes in the egg stage—hence the need for the prolonged treatment), and you now have a population explosion of these trematodes and other planktonic creatures, (some parasitic, some saprophytic) swimming in your aquarium.

This brings me back to item (a) above. It is unlikely that the present epizootic explosion would have occurred, *HAD YOU NOT HAD THE MASSIVE ACCUMULATION OF SEA-HUMUS IN YOUR U/G FILTER MEDIUM.* I would like you to carry out a simple test for me. Take a handful of your filtrant gravel and let it fall underwater. What I'm sure you're going to discover is that the heavier particles of white silica fall first, leaving a sizeable "cloud" of greyish-fawn sea-humus to slowly settle in the water. *IT IS THIS NUTRITIVE SEA-HUMUS ON WHICH THESE ECTOPARASITES FEED TO A LARGE EXTENT AT DIFFERENT STAGES IN THEIR LIFE.*

This is not the only reason why this sea-humus should not be tolerated in your tank! STERAZIN is like any other *biodegradable* chemical in as much as that its de-activation is vastly accelerated in the presence of significant amounts of organic material. The sea-humus in any marine biosystem provides just such a source of organic material and, if present in excess (as in some tanks I've seen), the STERAZIN is being de-activated virtually as fast as it is being added to the system. Consequently, for this reason alone, it is vital that all sea-humus be regularly washed and/or back-washed out of the gravel and *certainly* it must be done before a course of STERAZIN medication is started. One way of achieving this if you haven't a powerfilter (and are therefore unable to

backwash the U/G filter) is to switch off all aeration and filtration within the aquarium. Remove the corals and rocks and thoroughly agitate the filter-bed to throw all the sea-humus into suspension. Now slope the filter gravel coral-sand shell very steeply from front to back of the aquarium and leave the tank stagnant for 30 minutes to allow the sea-humus to settle at the front glass (*PLEASE NOTE.* The small decline in oxygen tension of the seawater during this half-hour will not unduly worry even the most delicate fishes and invertebrates.)

Now, siphon off the sea-humus from the front of the glass and, by throwing away the old sea-water as well as the sea-humus, take this as an opportunity to replace up to 25% of the old seawater with freshly-matured seawater.

The alternative, if you own a power-filter, is to place the delivery-tube from the power-filter down one of the airlifts and thus reverse the flow of water through the filter-gravel to wash the sea-humus out of the filter-bed and into the power-filter from where it is easily removed.

Now, with regard to the disturbing symptoms which you noticed after STERAZIN medication, these are almost universally observable in coralfishes (with the exception of most Damselfishes) within 5-15 minutes after adding the medication, for the full duration of the medication programme, and for up to 5-6 days after the terminating treatment. One could describe it as general lethargy and a reduction in the level of consciousness. Occasionally, with Surgeonfishes and Tangs particularly which are in a very debilitated condition as a result of prolonged neglect of a copepod fluke infection, the build-up of STERAZIN to therapeutic concentration may have to be very gradual indeed perhaps over as long a period as, say, 2 hours. In exceptional circumstances, e.g. with a Surgeonfish which is near to death anyway, the addition of medication may have to be suspended at *below* the therapeutic concentration.

Another problem with this medication and one frequently overlooked, is that two of the active ingredients within the complex synergic formulation do not go into solution at all well. They can be clearly seen as a brownish sediment on the bottom of a bottle which has stood for some minutes: If the "SHAKE WELL" instruction on the side of the bottle is ignored or unseen and the bottle is simply inverted and drop-addition started, these two highly active chemicals are poured in *almost neat* form into the aquarium resulting in a huge overdose.

This problem could easily be overcome in manufacture by producing STERAZIN at a much lower concentration level, i.e. *with these two particular ingredients at saturation-level concentration only*, rather than at super-saturation level as at present. However this would necessitate a much higher dosage level, i

more drops per gallon and therefore an inherent reduction in economy of use. We feel that STERAZIN is expensive enough already.

One final mention of an undesirable (but unavoidable) side-effect of this medication is that a fish which

has benefited from a full course of STERAZIN treatment will almost certainly be vitamin-deficient and will need a convalescence dosage of a vitamin supplement containing cyanocobalamin (vitamin B₁₂). This will speedily restore the appetite to normal.

REARING

Tealia coriacea

by H. G. B. Gilpin

Tealia coriacea is a typical predatory sea anemone, native to the N.E. Pacific, where, although there is no symbiotic relationship between them, colonies of this species provide a refuge for crabs whose hard shells protect them from being stung by the poisonous tentacles.

Early this year we introduced a specimen to a well-aerated, four-foot marine aquarium, maintained at a temperature of 76°F. and furnished with lumps of coral, set on a floor covering of coral sand. Already occupying the aquarium and well established, were three smaller anemones and four Clown Fish.

The new arrival came to us attached to a large Leopard Cowrie which was placed on the sand and, apart from feeding, the anemone was left to its own devices. It was, and is, a healthy-looking specimen, pale cream in colour with a base diameter of six inches. A compact, somewhat squat animal, its rather bare oral disc is surrounded by rows of one-inch long tentacles. These are thick at the base, rapidly tapering to a point and each carrying a maroon spot at the centre of its tip. It remained attached to the cowrie for several weeks and then slowly worked its way across the sand to a position half-way up the glass back of the aquarium.

From the beginning it has been an easy animal to feed, readily accepting small pieces of frozen prawn placed amongst its tentacles. These are engulfed, the nourishment extracted, and a cylinder of residue expelled. This floats to the surface after twenty-four hours and is removed to prevent the otherwise inevitable fouling of the water. This anemone has also been seen to take in small quantities of the dried marine food provided for the Clown Fish.

On the 14th August many minute, free-swimming larvae were observed in the aquarium. Production

continued daily for almost a week. At first they were only just visible to the unaided eye, although they could be seen clearly and in detail with the help of an 8× magnification hand lens. Within a week they had increased in size to that of the diameter of a pin. Their movements in the water were jerky and apparently unco-ordinated, reminiscent of those of *daphnia* in fresh water. This free-swimming stage soon came to an end, at least during the hours of daylight or when the aquarium was artificially illuminated, and they established themselves on the coral sand and on the glass sides of their container. Subsequently they were rarely seen to move except at night, when, if the light was suddenly switched on, a considerable degree of activity was observable.

The baby larvae were fascinating to watch. They each possessed nine tentacles which radiated from a central area. A long, fine filament extended from each tentacle, no doubt being of assistance to the animal in swimming. Generally they appeared to be colourless, although the tentacles and centre spot were darkly opaque.

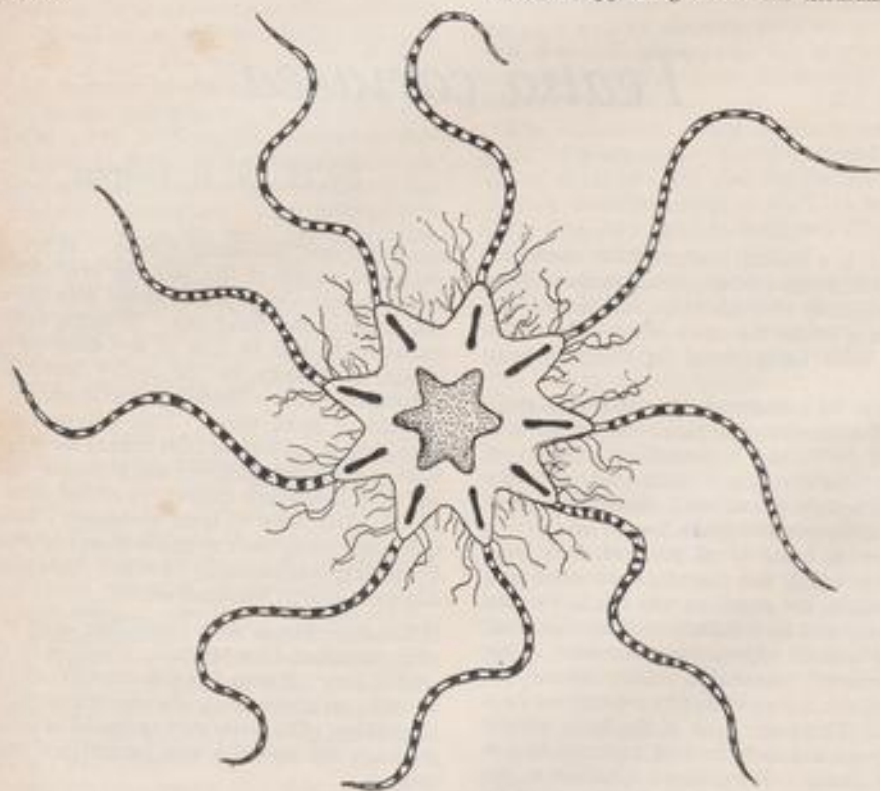
At first we were somewhat concerned as to what food the young anemones would require at this stage. Fortunately the problem largely solved itself. The aquarium was normally kept well supplied with brine shrimps and a few days after their birth one of the baby anemones was seen to engulf a tiny brine shrimp. Consequently the brine shrimp content of the aquarium was maintained, its continuance being justified by the survival and satisfactory growth of the anemones.

On several occasions a Clown Fish seized a baby anemone in its mouth but apparently it proved distasteful as it was quickly expelled with considerable

force, somewhat the worse for wear, back into the water. At first it was feared that depredations by the Clown Fish would have a serious effect on the successful rearing of the anemones but this did not prove to be the case. It seems that the jerky movements of the anemones attracted the attentions of the Clowns and impelled them to treat the little creatures as suitable items of food. Experience soon taught them otherwise. Apart from the initial loss of a few anemones, which in view of their numbers could well be spared, the impact of the fish upon the anemones was negligible.

survive for considerable periods without food. Lack of nourishment, however, results in a gradual diminution in size and a careful watch should be kept on the inmates of an aquarium to ensure they are receiving enough nutriment to keep them in good order and maintain a normal growth rate. Where food supplies are adequate this growth is continuous and considerable.

Tealia coriacea, under natural conditions occurs in partially protected waters, often burying itself in coarse sand or gravel with only the oral disc and tentacles appearing above the medium. Frequently



Although some species of anemones are hermaphrodites, most occur as males or females, in which case the female discharges her eggs into the water where they are fertilized by the male. They first develop among the masses of plankton and then settle on the sea bed. Large numbers are produced to counteract massive losses from such predators as sea slugs, starfish, sea spiders and some fish and crabs.

In other species of anemone, apparently including *T. coriacea*, the larvae develop in the body of the parent.

Anemones are said to be long lived in vivaria and to

shell debris and particles of sand are found clinging to its column.

Originally the anemones were established in our aquarium for the benefit of the Clown Fish but their fascinating colours, flowerlike appearance and interesting life cycle make them desirable inhabitants in their own right. That the Clown Fish appreciate their presence is evident from the way they weave their bodies amongst the tentacles, obviously revelling in the contact, and constantly return to their favourite anemone after spells of free swimming in the aquarium.



Who's lost a Trophy?

A trophy has come to hand from an exhibitor who must have thought it was won at our open show last year. This I'm afraid is not so. The trophy is a large cup with handles, about 12 in. high and is engraved; "THE NEWMAN TROPHY" for live-bearers. If any society recognises this trophy, they can get in touch with me and I'll send it on to them.

K. J. BATES,
6, Merevale Close,
Hinckley,
Leicestershire, LE10 0PZ.

B.M.A.A. Subs

I would like to ask you to publish this letter in your readers write column for all marine enthusiasts to note.

The subscriptions to the British Marine Aquarists Association as from November 1st 1973 will be £2 and £3 Sterling overseas without badge.

£2.30 U.K. and £3.30 Sterling overseas with badge.

This rise in subs was agreed at the A.G.M. held at the Committee Room of the London Zoo on 21st October.

If further information about the Association is required please do not hesitate to write to me.

J. H. VICKERY,
26, Rosalind Avenue,
Bramford Estate,
Woodsetton, Dudley,
Worcestershire, DY1 4JW.

Treatment of Ailing Fish

As a recent enthusiast of Tropical fish-keeping I have been dismayed at the contradictory advice from Aquarist shops on diseases affecting freshwater tropicals.

I have explained accurately the symptoms of diseases which have affected some of my fish including a recent outbreak which took the toll of approximately a dozen fish. Upon visiting five local aquarist shops their advice was very pleasantly forthcoming but summing up their views I had an outbreak of "Ick", velvet, flukes, lack of oxygen in the tank and toxic gravel and stones.

With reference to a few books I was still perplexed as descriptions were fairly vague on symptoms and

equally on dosage of curatives.

Even proprietary brands of medicine contradict on what diseases their curative treats, e.g., Methylene Blue cures white spot and flukes whereas another states that methylene blue does not treat flukes.

The more experienced aquarists will comment that prevention is better than a cure but how many new enthusiasts have lost stock through disease and decided to call it a day.

I would like to suggest that your magazine include in an issue a section on diseases, their symptoms, curatives and brief instructions on applications.

I am sure that many other people would appreciate sound advice so that no costly mistakes occur which brings me on to another point.

The prices of the more common fish varieties, e.g., platies, guppies, swordtails, danios and barbs have certainly increased over the last nine months, some as much as 60 per cent to 70 per cent, and the quality decreased. Smaller fish and higher prices (before VAT) make tropicals-keeping an expensive interest. Are other aquarists experiencing the same increases in other parts of the country?

D. J. ALDEN,
78 Heather Park Drive,
Wembley, Middlesex.

Air and Earth

I would like to comment upon your magazine's pronouncements in the November "Product Review."

Firstly with regard to the feature on the "Orion" pump. The idea of reducing supplied air to an aquarium at night is not very clever for several reasons. The photosynthetic action of plants in the daytime is reversed at night so that carbon dioxide is produced and oxygen consumed in the dark. The artificial air input is thus needed more at this time than any other. Biological filtration systems require a constant supply of air at all times to maintain aerobic conditions in the gravel bed and to ensure adequate rates of water flow so that the nitrifying potential of the system is not decreased. Assuming a biological system works properly in the daytime there is no point in reducing its efficiency deliberately at night. Similar arguments hold for ascending air bubble columns and other filtration systems.

Secondly a point on the aquarium wiring Unit. It may be a very good idea to earth a metal hood, in case it becomes live due to a fault in the lighting equipment so that the fuses will be blown out quickly for safety, but has the situation been considered where the aquarist puts his hand in live aquarium water and then touches the earthed hood with the other hand? He will then provide a path to earth for current from the broken heater or whatever with consequent unpleasant and dangerous effects on himself. It is far better to keep all earths far away from the aquarium and in the

event of live water to rely on the insulation provided by clothing, floor coverings etc. to reduce the effects of electric shock, than it is to provide a handy earth which will ensure a definite shock at full power in the above circumstances. Reliance on little lights which indicate live water is not good especially where children and other unfamiliar persons might be involved. The whole question of earthing in aquarium electrical systems is difficult due to the insulation properties of the glass and other container materials used and in my opinion the best method is to remove all earth points from the vicinity of the water so that any electric shock suffered may at least perhaps be reduced by not having an easy path to a good earth through the aquarist or person concerned.

It also seems to me that when we are asked to pay nearly four pounds just to tidy up our aquarium wiring we are coming to the point where fishkeeping will once again be only for the financially well-off.

A. JENNO,
113 Tukers Green Rd.,
Wilnecote, Tamworth,
Staffordshire.

Grading Judges

During the last eleven months, that is to say since the inception of the new three-tier judges grading system, there has been a certain amount of misgiving expressed concerning this by members of various clubs.

May I, as a junior member of the current Judges and Speakers committee, point out that any system devised for grading judges will have its disadvantages.

Whilst I personally would favour a system of judges of one grade, with a further grade of trainee judge, I must admit that even this would have its disadvantages. Mainly the decision as to whether the trainee is sufficiently competent to judge at Open Shows.

This could be dealt with in a similar manner to the "A" class test now in use.

May I also point out that in the November 1962 issue of *'The Aquarist and Pondkeeper'* the enclosed item was printed and that I feel that those points raised, particularly those which I have underlined, are still applicable today as they were then.

R. Fox,
44 Ivy Road,
Cricklewood,
London N.W.2.

Training of Judges (From *Aquarist*, Nov., 1962)

The tropical fish-keeping hobby is still so young in Britain that the first generation of judges, many of whom are still officiating, were promoted by popular consent.

They became judges because they had the necessary self-confidence and personality, had opportunities to express their opinions, saw plenty of fishes, gained experience, became better known and were increasingly called for.

No doubt their initial experience was gained in their own clubs.

While it is now possible for established judges to estimate the abilities of the newcomers, the above-mentioned processes have still to be followed by those intending to become competent judges.

The Federation of British Aquatic Societies had a scheme by which volunteers were examined at a series of meetings and if a sufficient degree of proficiency was revealed the candidate was graded as either an A or B judge. An A judge was considered to be competent to deal with Open Shows. B judges were those found to have less ability but enough to judge minor shows.

Successful candidates were classified in one or more of seven categories: goldfish varieties; coldwater fishes other than goldfish; livebearers other than guppies; labyrinths; characins and barbs; other tropical fishes; furnished aquaria. The judging of guppies was conceded in the main to the Federation of Guppy Breeders Societies.

The scheme was found to have several shortcomings. Firstly, some of those living at a distance from the place of examination were unable to attend and so became excluded from the F.B.A.S. panel. Secondly, among those who achieved success in examination a series of permutations resulted: some A or B for all categories; some A or B for some categories; some a mixture of A and B in all or some categories.

Concurrently with the operation of the scheme it had become the general practice for judges to accept 15 shillings plus expenses for an engagement. The clubs, not surprisingly, favoured the A judges. Further, as most clubs have little money, they tended to engage one judge whose classification covered all the fishes in their show. Judges with mixed or part classification were under-employed. B judges were largely unemployed and all these were obstructed from gaining the experience needed for up-grading.

Alternatively, judges found themselves being invited to deal with fishes for which they had no grading. Usually they obliged, rarely failing to give satisfaction, and thereby became more experienced. In other words, we were where we came in and those able and prepared to gain experience in judging did so and became accepted, regardless of classification, among a growing number of clubs.

The F.B.A.S. found it necessary to discover a means to get more of its judges employed. The fee of 15 shillings was declared to be nothing sacred. The popular judges were encouraged to ask for a higher fee, at least for occasions that warranted it. In this respect some shows tended to be run on the cheap. At the same time Class B judges were encouraged to accept engagements for a more modest fee or no fee at all. Clubs were induced to regard these as serving an apprenticeship and several B judges have since been getting more engagements and this should help them towards having their grading reconsidered.

More recently the F.B.A.S. has agreed to invite member clubs to recommend people who they consider to be competent to act as judges. Such recommendations are considered and Class B grading may be granted forthwith. It is hoped that clubs will keep the Council informed of all Class B judges' progress so that when there is sufficient evidence of increased ability an acceptable means can be devised to effect promotion to Class A. This may involve B judges scrutinising entries in open shows and revealing their findings to the official judges present so that progress

can be estimated. This, of course, could only be possible with the consent of all concerned.

In the last analysis it is the clubs who decide who is competent and who is not. If the clubs make well-considered recommendations for appointment to Class B and if the clubs will provide opportunities for experience to be gained we should soon have an adequate number of judges capable of undertaking any engagement.

The F.B.A.S. does not claim to have found all the answers to the problem of how to develop and promote acceptable judges of aquarium exhibits. I would submit that a not unimportant consideration is our state of mind. We are, presumably, in the organised hobby because it gives pleasure and an opportunity to meet people with similar interests. We like to match our fishes, plants and aquaria against others. Which is the better will always, to some extent, be a matter of opinion. If infallible devices could be invented to measure the qualities of our specimens a lot of the fun would go out of this aspect of the hobby.

A tolerant and helpful attitude among all concerned is the prime necessity.

FRANK STONE, *Chairman*,
Federation of British Aquatic Societies.

Apistogramma ramirezi

I am writing to you in order to try to help fellow hobbyists with their methods of sexing *A. ramirezi*. I feel that it is about time that someone dissolved the

myths surrounding this subject.

Firstly, much of the aquarium literature on the subject, says that *A. ramirezi* can be sexed by the black extensions on the dorsal fin. This is not so. I have often seen adult males with no extension, and adult females with one!

Secondly, there is the theory of more pointed dorsal and anal fins, in the male. I personally have, at present, an adult pair of Rams, where the male has beautifully rounded fins, and the female sports slight points.

From four years of fishkeeping experience I know of only one foolproof method of sexing, which is: On either side of a Ram is a large black/brown blotch, and hundreds of small reflective dots. Where these dots overlap the blotches of a male Ram, they are unchanged. However, where they have overlapped on a female's blotch, they become much brighter under any lighting and from any angle. This even applies when the other dots cannot be seen.

This method can be used even on very young and immature specimens.

IAN HIGGINBOTTOM, S.V.A.S.
(15 years)

6 Talbot Place,
Sheffield 2., Yorks.

What is Your Opinion?

continued from page 374

With live foods rather scarce at this time of year I have recently discovered that a welcome change of diet for my large fishes is the tiny caterpillars found in brussels sprouts and the like. The angels are particularly fond of these and will even eat them in chrysalis form; I have been feeding these for several weeks with no apparent ill effects.

"Are there any other denizens of the lettuce which would be suitable food? I can't bring myself to chop earthworms, but we have an abundance of tiny slugs and caterpillars in the summer. I would also be most grateful if you know of any stockist of rather more exotic species in my area as our local shops only keep the usual 'community' fish and I yearn for the scats and puffer fish of yesteryear when I lived in London." (Would anyone care to reply to Mrs. Houps' queries, please? I'm afraid that my knowledge of Folkestone is limited to that which can be gained from waiting at the harbour for a boat to France!)

Mr. T. A. Straw, whose home is at 7 Deepfield Way, Coulsdon, Surrey, recently asked me about the black neon (Photograph 2). I would be pleased to hear of readers' experiences with the keeping and breeding of this attractive little tetra. I find that it

makes an ideal companion for neons and cardinals.

That's all for this edition. For a future feature please send me your opinions on the following. (a) What is the quietest pump you have ever used and would you recommend it to others? (b) What conditions have you found to be most suitable for optimum growth of dwarf Amazon sword plants? (c) What are the advantages, if any, of tablet foods over flake foods? (d) Please let me have details of your experiences with species of *Aponogeton*. (e) What have you found to be the easiest egg-layer to breed, and under what conditions? (f) What have been your experiences with the use of aquarium plant fertilizers and special compost media used under aquarium gravel? (g) It has been said that the watching of fishes swimming in an aquarium can have a calming influence on those who are emotionally or psychologically disturbed. Do you have any experiences to relate that would prove or disprove this contention? I would be pleased to receive your opinions on any of the points raised in this month's feature. Send them to B. Whiteside, c/o 'The Aquarist & Pondkeeper'; and please PRINT your name and address clearly.

From a Naturalist's Notebook

by Eric Hardy

WHEN the news editor of a daily paper phoned me one night to say they had a story of a salmon caught at the Mersey mouth, he was a little surprised when I asked if he were sure it was a salmon. One of his reporters, a keen angler, had seen and confirmed it! "Are you sure it wasn't a sea-trout?" I added, without shaking his confidence.

When the photo appeared it was obviously a sea-trout, though the anglers who caught it in their landing net had all acclaimed it a salmon. The confusion is not uncommon. Indeed, in Dr. Travis Jenkins' classic book on *The Fishes of the British Isles*, the titles for the plates of salmon and sea-trout in the second edition were transposed, and had to be blacked out after the book was paged and printed, and retitled. The most reliable difference is to count the scales, side by side from the fatty fin, the little lobe between tail and dorsal fin, and the lateral line, which marks the side of a fish. Salmon-scales are the larger and number 12 or less (the range is 10-13). Trout-scales are smaller, but 14 or more in this line (range 13-16). Trout are more spotted especially on the gill-plate, and the tail is slightly less forked, being more notched than in salmon. The salmon's dorsal fin has 10-12 branched rays, only occasionally 9. The number in the trout is 8-10, rarely 11. Trout have a stouter tail-base. The anal fin, under the tail, is more pointed in trout, the longest ray extending further than the last one (the reverse in a salmon).

Sea-trout are merely a migratory form of common brown river-trout, not a separate species. They don't go anything like so far to sea as do salmon, but little is known of their sea journeys. One of a number tagged at Colyford in the River Axe, Devon, in October, 1959, was recovered 266 days later in the Tweed estuary at Yardford, 580 miles away if it travelled via Dover Straits, or 1,130 miles if it went by the Irish Sea. The other sea-trout tagged that day were recovered in the Rivers Exe, Otter, Teign, Erme and Taw, a minimum journey of 244 miles in 174 days.

The floating American water-fern, *Azolla filiculoides* has been established in many ditches, chiefly in Southern England, but north to Cheshire, where its survival depends upon mild winters. The latter contributed to its recent increase in the River Colne from Springwell to Uxbridge near London, where it has been established over half-a-century. It was cultivated with other saleable aquatics in the famous watercress-beds there, whence it spread downriver in

subsequent floods. It abounds in the Grand Union Canal there, from Denham Lock to near West Drayton, and in parts of Fray's River from Denham Lock to Cowley.

It was apparently first noted in England in 1911 and grows also in the Basingstoke Canal. A small, floating plant living in symbiosis with the blue-green algae *Anabaena*, its tiny, leaf-like fronds are only one-sixteenth to one-eighth inch or 1 mm. long. Three pieces of foamy tissue enable its spores to float. They give direct rise to the prothallus. Like a mossy duckweed, its rows of tiny two-lobed leaves, red in autumn, it becomes densely tufted, with branches projecting above the surface. The smaller, flatter, less branched *A. caroliniana* was found wild at Pindon, Middlesex, so far back as 1883, and more recently in Cheshire (Willaston). Both have spread rapidly on the Continent.

Immature *filiculoides* have sometimes been confused for *carolinensis*, whose sterile form is difficult to determine.

Is the Canadian St. John's wort, *Hypericum canadense*, which was found in 1954 on the Galway shore of Lough Mask and in a meadow near the car-park at Eccles Hotel, Glengariff (County Cork) in 1968 a native of our flora? This has been suggested in botanical circles. It grows in wet, acid sand or peat, as the first European record, in 1935 in East Holland. It has recently been met with in the Mayo area of Lough Mask, like Stah, the Glensaul River and Killaleensaun, and the south-east of Lough Nadirk-mure. However, it is sometimes imported with cultivated plants, though the "weeds" of it found at Hilliers' Ampfield (Hants.) nursery in 1967 died out.

Another newcomer to our waterside flora is the Australian rush, *Juncus planifolius*, first found growing in the northern hemisphere at Lough Truscan in Galway, and with marsh yellowcress at Turlough, Bealaclogg (Clare) and western Galway's Renvyl.

Noticing the headline "Hyacinths Stir Flora Dispute" in the American *Xian Science Monitor* in November, I thought of spring bulbs in the border. I soon discovered that the "purple-flowered hyacinth" costing Florida \$7 millions a year to control in 200,000 acres of waterways was not the famous Dutch bulb, but a relative of pickerel-weed, *Eichhornia crassipes*, the water-hyacinth from tropical South America which flowers sporadically in July in the temperate aquatic house at Kew, and several amateur greenhouses. North Americans are notoriously confusing in their erroneous

use of abbreviations and nicknames. Nowhere was the prefix "water" used in this news story of the Audubon Society's opposition to the use of the herbicide 2, 4-D to eradicate this choking weed from navigable waterways, because of its risk to other wildlife there. Floating on bladder-like leaf-stalks, it drifted to new haunts after its first introduction from Venezuela to a New Orleans Exposition in 1884.

It chokes much of the Congo, the lower Mississippi, the Niger, Senegal and Nile rivers, as well as Java. Spraying with 2, 4-D is the usual method of eradication in relatively still waters.

Britain's 47 mayflies envisage muddy watersides and rising trout; or the common pond olive, *Cloeon dipterum* breeding in the post-war EMS water-tanks left in Manchester and Liverpool after the air-raid precautions. Its nymphs are still frequently met in garden-ponds in the suburbs of these towns, and London. Adult mayflies, probably of windblown origin, have sometimes been recognised on high window-sills of Whitehall. *Baetis digitatis* is the most recent addition to the British list in Kimmins' 75-page revised *Key to Adults of British Ephemeroptera* (Freshwater Biological Assoc., 1972).

Fortunately, the distribution of aquatic insects, like the rest of the Provisional *Atlas of the Insects of the British Isles* being compiled in the modern scheme to map everything's haunts here, is more natural than that of many freshwater fishes which are ever being transplanted by anglers. Lancashire River Authority is concerned about the "smuggling" of barbel from the Shropshire Severn, where their 1957 introduction has been a success, to the Ribble. They fear the introduction of fish-parasites with the barbel, though I suspect their real concern is to maintain the Ribble-Hodder as a salmon and trout river without too many competitive coarse fish. The same "class war" arose over barbels, unofficial introduction to the Wye and the

Welsh Dee. They are not natural fish of our west coast (Atlantic) rivers, but of the east (North Sea-Rhine) origin before Britain separated from the Continent, so there is a zoological case against their introduction. If the fear is columnaris bacteria, this could be introduced by other coarse fish used to stock water, like roach.

The other year I mentioned a winter robin flicking minnows out of a small partly ice-bound garden-pool. A similar incident is a cock blackbird taking newts from a lily-pool at Wembley, a habit previously noted with blackbirds. The common sandpiper has been found taking small fish at Staines Reservoir, Middlesex, etc.

Last November, my friend, H. E. Hilton, the Cheshire aquatic nurseryman, brought me from his lily-pools a plastic bag of frog-tadpoles which again, as I mentioned in a similar sample the other year, hadn't matured at the usual time. More interesting after that mild season, he also brought November-flowering specimens of *Caltha palustris plena flora*, the double form of our native marsh-marigold, and of *C. polypetalata* the Asiatic giant marsh-marigold, though much smaller than its usual three-inch wide flowers of spring. He also had then a pool full of the black-centred white flowers of *Aponogon distachyus*, the African water-hawthorn which normally flowers in summer. Nurtured in our ponds, this plant is so abundant in the Near East that manatees are used to control it. Two forms of double marsh-marigold exist. The one mentioned above was the fully double, small variety called *nana*, a strong yellow which flowers earlier than the native. It was flowering at the end of January, 1973, in the same site. The larger, paler, semi-double *monstra* is also cultivated. There is also a smaller, more creeping sub-species *minor* in Scottish mountains, of which *radicans* is a variety once in Forfarshire, but now extinct there.

PRODUCT REVIEW

Kenray Multi-Purpose Filter Conversion Kit, manufactured by Kenray (Patented) Products Ltd., Commercial Place, Lake Road, Portsmouth, Hants., PO1 4DT. Price 25½p plus 2½p VAT.

A few months ago I reviewed the Kenray Multi-Purpose Filter. Since then the firm has produced a Conversion Kit for the early model. It contains the appropriate tubes, connectors, joints, metal strip, etc. necessary to up-date the early model of the filter; and it should be of interest to those who have an early model filter. The components are soundly constructed and the kit is supplied with a comprehensive instruction leaflet complete with easily understood diagrams.

B. WHITESIDE.

What am I?

By Hilary Maynard

My first is in CORNFLOUR but not in MILK,
My second is in SATIN and also in SILK,
My third is in YELLOW but not in CHROME,
My fourth is in CARPET but not in HOME,
My fifth is in MOWER but not in TOOL,
My sixth is in JESTER but not in FOOL,
My seventh is in GREENFINCH but not in TIT,
My eighth is in BROKEN but not in SLIT,
My ninth is in TEARFUL but not in CRY,
My tenth is in SECRETIVE but not in SLY,
My eleventh is in SINNER but not in SAINT,
My twelfth is in COLOUR but not in PAINT.

Answer on page 400.



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.

GOLDWATER QUERIES

by Arthur Boarder

You never publish the names and addresses of the enquirers you answer. Why is this? Is it because you make them all up?

The names etc., of enquirers are never published because many people would not like this. I know that there are many people who just cannot resist writing letters in the hope that they will see their names in print. I have no time for these people. I do not have to make up any queries as I have many more than are published monthly in *The Aquarist & Pondkeeper*. I first started answering for this magazine on 3/3/51, and I have the reference numbers, names and dates of replies for the thousands I have dealt with since then. If anyone can prove that any are false, there is £100 waiting for the claimant. For many years I have answered all the fishkeeping queries, both tropical and cold, for three of the large pet food firms in the country and I have records of all these which are very numerous.

I have a tank, 36 x 15 x 12 inches with three four-inch comet tailed shubunkins. One has died with swim-bladder trouble and now another fish shows similar symptoms. Where have I gone wrong?

When swim-bladder trouble appears in young fish it is often because of some weakness in the strain, but with fish the size of yours this is unlikely. It then seems that there is something wrong with the conditions in your tank or your feeding. The tank is large enough, although your method of showing the measurements may be different from that of most aquarists. When giving the size of the tank it is usual to give the length, breadth and depth in that order. I suspect that your tank is 15 inches deep. If the water conditions are in order then it may be that as the water has cooled down with the approaching winter you have not reduced the food given. The fish are unable to digest their food as well when the

water gets cold and so this can cause pressure on the swim bladder. Reduce the depth of the water and, if possible, raise the temperature to about 60°F. Do not feed at all until the fish appear to be swimming normally.

I have bought a pair of sunfish, which I believe are Pumpkinseed. How big can they grow, will they breed and how can I sex them?

The pumpkinseed sunfish is (*Lepomis gibbosus*), and is a pretty fish for the tank. They come from the U.S.A., from lakes in Florida and Texas. In natural surroundings they can grow to seven or eight inches long, but in a tank they are not likely to get anywhere near this size. Usually the female is paler than the male but can become much brighter when spawning takes place. The tank should have some fine sand for base compost so that the male can make a kind of nest for the eggs. The male tends the eggs and fry but the female should be removed after eggs are laid. Some males look after the fry for a couple of weeks but should be removed when the fry are free swimming. The eggs hatch according to the temperature of the water, taking from three to six days. A hard water is preferred to a soft one by these fish.

I have two black-banded sunfish but cannot tell their sex. I did find a few eggs in the tank and one fish was fanning the eggs either to keep them clean or to frighten off other fish. How can I sex them and breed them? Nothing hatched from the eggs I found.

It is not easy to sex these fish in normal times but when in breeding condition the female takes on much brighter colours and the male fish turns pale. You must have the two sexes as it is the male fish which fans the eggs, not to keep other fishes away but to help to keep the eggs well oxygenated. The male usually makes a kind of nest on the bottom and may

on well with similar sized, well-behaved companions in a community aquarium. It flourishes best at a temperature in the middle to upper seventies (°F.) and eats any small live and dried food. It is a fast mover and sudden jumper, so its tank should not be left uncovered.

I have just read in a magazine an interesting account about how it is possible to make reproductions of dead fish on sheets of absorbent paper. What can you tell me about this new art form?

The technique of taking prints from dead fish is not very new. It originated several years ago in Japan, where it is practised by anglers. The technique is known as *gyotaku*. It very much resembles in practice and result what we over here call brass rubbing. A large dead fish such as a carp is wiped clear of slime and then brushed over on its upper surfaces with a polymer colour or quick drying ink. A sheet of suitable textured paper is placed on top of the fish and is followed by gentle rubbings and pressure to transfer an impression of the fish onto the paper. A good account of this technique will be found in *Picture of Japan* by Collin Simpson (Hodder & Stoughton, 1966).

Could I keep some very small Koi in a heated community tank?

You could but I wouldn't recommend it. Firstly *koi* demand a great deal of swimming space. Secondly, they are much given to disturbing the bottom. Thirdly, temperature in the sixties or low seventies (°F.) would hasten their growth which would raise problems. Finally, *koi* are essentially pondfish and as such are not suited to a protracted stay in the ordinary aquarium.

I should be most grateful to receive some information about a catfish called *Synodontis leopardinus*.

All I can tell you about *S. leopardinus* is that it is found in the natural state in the Upper Zambesi River and is popularly known in southern Africa as the spotted squeaker. Distinguishing features are a tall dorsal fin, branched mandibular barbels, and a dense peppering of dark brown spots on a lighter ground. In some specimens the spots mingle to form a patchy brown pattern.

Please give me some information about the freshwater sole.

The small flounder or sole usually seen in dealers' tanks is a species commonly found in the salt, brackish and fresh waters bordering the eastern coast of the U.S.A. It is known to science as *Trinectes maculatus* or *Achirus fasciatus*. In the aquarium it grows to about 6 in. and eats almost anything you care to offer to it. A temperature range from about the middle

sixties to the middle seventies (°F) suits it well. It is not altogether an ideal fish for a decorative community tank; for by nature it is a fin-nipper and a disturber of the planting medium.

I have a slender bodied species of *Lebo* that I cannot find described in any of my aquarium books. I wonder whether you can fill me in on its scientific name? Its sides are pale yellowish to olive, the underparts white, a black streak extends from the snout to the eye and another dark marking bars the root of the tail. The fins are pinkish to red. At the time of writing this fish is about 2½ in. and spends most of its time swimming horizontally or nosing head-down about the bottom.

I suspect that the fish you have is *L. frenatus* from the Mekong River. Ordinarily this species attains a length of about 5 in. and is quite suited to a community tank.

What is the life-span of the harlequin fish?

Given old water inclining to acidity (in the natural state the water in which this fish lives has a pH in the neighbourhood of 5.5.), good food, and non-bullying companions the harlequin fish or *Rasbora heteromorphia* will live for upwards of five years.

Is it true that household bleach can be used to remove evert stain and particle of dirt from aquarium grit?

Yes, but do make certain that after using household bleach to clean aquarium grit the whole lot must be given a very long washing under running water to make it safe for plants and fish.

Would you please give me some information on the general behaviour and care of the fish called *Geophagus jurupari*.

Geophagus jurupari is one of the better behaved cichlids from the north-eastern half of South America. For some unknown reason it bears the popular name of demon fish. I once kept two female *G. jurupari* in a thickly planted community tank housing a collection of small characins, livebearers and barbs. Up to the time the demon fish died of old age everything went along very well, for in the main *G. jurupari* minds its own business and prefers to spend its energy mousing the compost in its search for food. In the matter of food, it will eat anything meaty or dried. The usual range of temperature suits it.

I have bought two young *Tilapia mariae* and would like to know the maximum length of this species and its attitude to other fishes?

T. mariae will reach a length of about 8 in. It is a bullying species and is best kept on its own or in a spacious tank with fishes of its own impressive build and size.

I spent several hours constructing a tank of glass stuck along the edges with a silicone sealant, but after I filled this tank and introduced fish they all died. Do you think I have strong grounds for lodging a complaint with the manufacturer of the sealant?

I hardly think a sealant manufactured for aquarium use would result in any trouble in your tank. After all, silicone rubber sealants are used in the manufacture of tanks destined to accommodate some of the most delicate of aquarium creatures. In all probability the sealant you used was intended for sealing around kitchen sinks or gaps round windows. However, it is always a good plan to soak a sealed tank for twenty-four hours and then change the water before placing fish in it.

Do fishes in India and other tropical countries breed all the year round?

Fishes in tropical countries do not breed all the year round. Well, not oviparous species at any rate. They breed just before or during the rainy season. However, as the rainy season begins at a different time in some parts of India there is no one time of the year for the spawning of all indigenous species.

I should like to know whether *Haplochromis callipterus* would make a suitable addition to my community tank? Also, what length will this species attain and will it accept dried food?

H. callipterus is a quarrelsome cichlid and is not at all suited to a community aquarium stocked with peaceful species. As to length, it grows to about 4 in. In the matter of food *algae*, dried food, small living creatures and the flesh of beasts and fish is suitable. In point of fact, *algae* or a substitute for *algae* should be included in the diet.

THE URUGUAYAN CHARACIN

by B. Fry

ACCORDING to at least one authoritative American publication on tropical aquarium fishes, this well-built schooling characin attains a length of about 4½ in. Yet hobbyists who have kept this species for eighteen months or more know from their own experience that it will grow to a much larger size.

In general shape and appearance *Pedalibrycon felipponei*—to give this fish from Uruguay its formal name—bears a close resemblance to *Moenkhausia sanctae-filomenae*. In short, it has the same rather compressed but well-padded body and a conspicuous black transverse marking in the base of the caudal fin. Also, like the latter species, it has very noticeable scales which reflect diamond lights from a dull leaden ground. The upper part of the body and the back are greenish olive to light brown. The underparts are white. Another characteristic it has in common with most, if not all, *Moenkhausia* spp. is its tendency to take pieces out of plants and, occasionally, the fins of sluggish or smaller fishes sharing its tank.

These two failings apart, *P. felipponei* makes a good

aquarium fish because it has a wide temperature tolerance—a most valuable asset these days—and is likely to live out a gradual fall in the temperature to the middle sixties with no harm done. Ordinarily, however, it flourishes best at a regular tropical tank temperature. Then again, it asks for nothing special in the way of food: dried flakes out of a drum, live *Daphnia*, whiteworms, and the like, and tiny pieces of lean meat are taken freely. It is not faddy about the quality of the water. What it does need, however, is cleanliness and plenty of swimming space.

The Uruguayan Characin frequents the middle and upper levels of the water and is active and bold enough to keep in full view. No record has come my way of this fish having bred in captivity. As for external sex distinctions, it is reasonable to assume that in well-grown fish of about the same size the female would have plumper sides and a taller body, that is from the ventral surface to the dorsal ridge than the male.

FURNISHING AQUARIA FOR AFRICAN MOUTHBROODERS

by Jorgan & Pamela Hansen

A MOUTHBROODER is a fish which takes its eggs into the mouth either before or after fertilisation and cares for the fry until, and sometimes also after, they become free-swimming. The main group of mouthbrooders are cichlids, although mouthbrooding also occurs amongst non-cichlids (e.g., *Sphaerichthys ophromenoides*, the Chocolate Gourami, and *Betta brederi*, the Mouthbrooding Betta).

Although mouthbrooding occurs amongst American cichlids of the *Geophagus* genus, the behaviour of these mouthbrooders is very similar to that of non-mouthbrooding American cichlids, and so we would exclude *Geophagus* from a typical mouthbrooder tank, which we can then name—"The African mouthbrooder tank."

The *Tilapia* and *Haplochromis* genera comprise the two main groups of African cichlids, with most of the remaining African cichlids having developed from these two groups. All the known *Haplochromis* species, and perhaps the majority of the other African cichlids, are mouthbrooders. Mouthbrooders are found throughout Africa, with only a few species in North and South Africa, the main bulk being found in the Great Lake area.

They are, as a rule, polygamous; established pairs do not generally occur, although with *Tilapia melanotheron* the male carries the eggs in the mouth, and with *Tilapia galilaea* male and female take turns in doing so. The size of these fish varies from 6-50 cm. (2 in.-1 ft. 8 in.) in length. Their behaviour and eating habits differ widely and it is thus advisable to know a little about the different groups before setting up a mouthbrooder tank as it must be set up according to the needs of the fish.

Water

The native water of these mouthbrooders is hard and alkaline (from DH 20 and up, with a pH of 7.5 to 9.5), so they will not thrive so well in soft water. They like high temperatures of up to 30°C (86°F) but thrive in temperatures as low as 20°C (68°F). When temperatures are high the concentration of oxygen in the water is already low, and moreover as metabolic processes are speeded up, a faster production of waste products is entailed and a greater consumption of oxygen both by the bacteria which break up these

waste products and by the fish. Good aeration and/or a weekly change of water will thus be necessary.

Tilapia group

We have divided African mouthbrooders rather arbitrarily into four groups which have more or less differing behaviour patterns and requirements, although in some ways the groups overlap.

The first of these groups we will mention is the *Tilapia* mouthbrooder group. Most species of *Tilapia*, although not all, are mouthbrooders. Their sizes vary from 6-35 cm. (2½-14 in.), which means that many are too big for the average-size tank. However, now and then some of the smaller species appear for sale, and to a certain extent it is true that fish grow in accordance with the size of the tank. In nature, large *Tilapia* suddenly cut off in a small partly dried-up lagoon will produce offspring which grow to a smaller size and mature much earlier (at the age of a few months rather than at two years or more) than when living under their original more favourable conditions. When favourable conditions again prevail they will again produce offspring which grow to normal size. Moreover, the size mentioned in aquarist books is often the maximum size of a caught wild specimen, which size they will rarely attain in the home aquarium.

Most species of *Tilapia* have lovely bright colouring, especially when breeding. In nature they travel about in large shoals with breeding taking place over or in nests made by the males at the bottom of the lake: there should therefore be plenty of gravel in their tank for digging purposes.

Tilapia are specialised users of phytoplankton, i.e., algae suspended in the water; several species feed primarily on phytoplankton but consume planktonic bottom deposits when phytoplankton is scarce. In Lake George *Tilapia* feed largely on bottom deposits as the phytoplankton present is mostly indigestible blue-green algae. *Hemitylapia oxyrhynchus* from Lake Malawi consumes epiphytic algae, i.e., algae growing on or around higher plants, and mostly, or perhaps exclusively, scrapes algae from *Vallisneria* leaves. *T. rendalli* and *T. zillii* (non-mouthbrooders) chop pieces from higher plants, and will accept leaves of several terrestrial plants; it is not surprising that some

Tilapia species when placed in aquaria and deprived of their natural foods will begin to eat aquarium plants. Although *Tilapia* do not in nature eat algae attached to rocks (Aufwuchs) as do members of the Mbuna group, *T. mossambica*, which is not a true phytoplankton eater, gnaws algae from stones in the aquarium.

One should not use a tank with a capacity of less than 100 litres (25 gallons) and in fact the tank should be both as long and as wide as possible. For each fish 10 cm. (4 in.) long one should allow at least 10 litres (about 2½ gallons) of water, and a fish 20 cm. (8 in.) long should have at least 20 litres (5 gallons) of water. If one wants plants, large ones such as *Echinodorus* species, e.g., *brevipedicellatus* or *cordifolius*, and *Vallisneria gigantea*, would be suitable.



SEEN FROM ABOVE



The tank might be divided into two zones as shown in figure 1. The distance from the front glass to the border of the zone is at least 20 cm. (8 in.), and in this area there is ordinary gravel 10 cm. (4 in.) deep, with here and there a stone placed directly on the tank bottom, so that it cannot slide if the surrounding gravel is dug away. In the back part of the tank in zone 2, there are large stones and bits of slate forming caves and tunnels and any plants should also be in this area.

The plants are planted in gravel, and to prevent the fish digging them up, the whole surface in zone 2 is covered with small stones from 2½-5 cm. (1-2 in.) in diameter. The tank is thus set up so that in zone 1 there is space and opportunity for digging "nests" for breeding purposes, whereas zone 2 gives protection and concealment. Avoid constructing hide-outs which it is impossible either to see into or to get one's hand into, as if a fish dies in one of these places it might pollute the water before one discovers and removes it.

If necessary leave out the plants and instead place

flat bits of rock or slate along the back of the tank.

The biggest problem one will meet is identification of the various species of *Tilapia*, as only a few are mentioned in aquarist literature, and the names dealers attach to the fish they sell are often imaginative. The following authentic mouthbrooding *Tilapia* species can sometimes be found in trade: *T. mossambica*, *T. melanothron*, *T. macrochir*, *T. variabilis*, *T. galilaea* and *Chromidotilapia guentheri*.

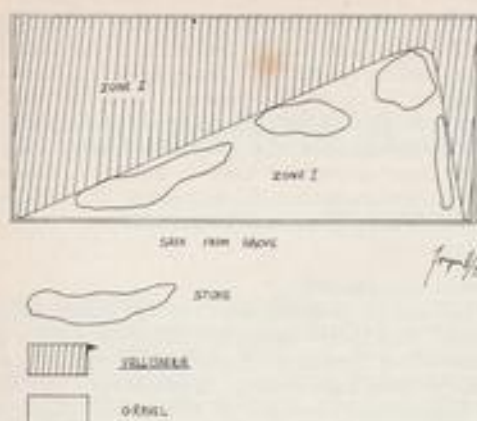
Piscivorous species

The second mouthbrooder group which would benefit from a special set-up comprises the piscivorous or fish-eating species of *Haplochromis*, e.g., *H. compressiceps* (from Lake Malawi), *H. gowersi* (L. Victoria), *H. longirostris* (Victoria), *H. livingstoni* (Malawi), *H. polyodon* (Malawi), along with similar piscivorous species such as *Lamprologus compressiceps* and *Rhamphochromis* spp. from lakes Tanganyika and Malawi respectively. These should not, of course, be kept together with smaller species which they would devour. They can reach a size of up to 25 cm. (10 in.); the colours are not especially bright, but the patterns are sometimes strange. To do justice to these fish one must supplement their diet with live fish; if one breeds guppies, then the possession of these fish will definitely help improve one's stock, as all inferior young can be added to their diet. If fish cannot be obtained, *Daphnia*, liver, and heart, are good substitutes.

Most piscivorous species have streamlined slender bodies and large eyes and mouth. Fishes up to 10% of the predator's length are swallowed whole by *H. longirostris*; larger fishes are ingested more slowly, the largest being about 25% of the predator's length but less than 5% its weight. *H. gowersi* will sneak up to a good-sized prey and then attack suddenly and seize the prey from behind; the entire process of capture and engulfment takes up to 20 minutes. *H. compressiceps* with its flattened head and body and greenish coloration can make itself almost invisible amongst *Vallisneria*. Eye-biting occurs with these fish, but should not occur if one feeds with fairly small fish which will be swallowed whole. However, perhaps this fish should be kept together with members of its own species only.

Certain fish such as *H. pardalis*, *H. polyodon* and *H. kribia* of Lake Malawi keep to rocky shores when young and feed on zooplankton and insects, but later move farther offshore and become partly piscivorous in their habits.

In order that the prey suffers as little as possible, one can make the tank in such a way that the predatory fish has all the chances and the prey none. One can divide the tank into halves but this time by a diagonal, which will provide plenty of swimming space, and will give the impression that the tank is larger than it is.



The whole of zone 2 (see figure 2) should be heavily planted with *Vallisneria spiralis* or *Vallisneria gigantea* although it must be noted that the corkscrew variety of *V. spiralis* loses its screw when planted in water over 20 cm. (8 in.) deep. In zone 1 (the free-swimming zone) a few stones could be placed, some flat, some perpendicular, as there have been very few, if any, reports of spawning from this group, so their preferred spawning surfaces are largely unknown.

Remaining *Haplochromis* species

The third group is composed of a widely varying collection of fishes with widely specialised feeding habits. 5-7 species of *Haplochromis* in Lake Victoria live by eating eggs and larvae of other mouthbrooders. *H. obesus* and *H. microdon* feed on fry not large enough to have left the parent's mouth, while *H. cronis* devours slightly older fish. Fryer and Iles (*Cichlid Fishes of the Great Lakes of Africa*) suggest that the baby fish in question are voluntarily rejected by the parent under adverse conditions, which moreover has the effect of regulating population densities.

Some are mollusc feeders; *H. sauvagii* copes with the shell problem by extracting the body from the shell, while a few other *H. haplochromis* species as well as the *Macropodus* and *Hoplotilapia* genera crush the shells in their jaws, spit out shell fragments, and swallow the soft body. Other species crush the shell and swallow it together with the soft parts.

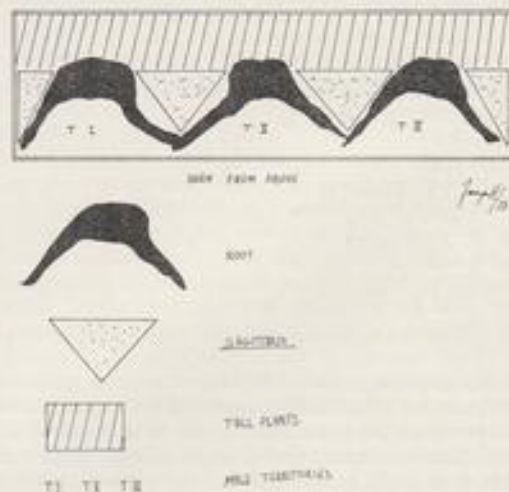
H. euchilus of Lake Malawi and *H. chilotes* of Lake Victoria feed on insects, whose presence they detect by means of fleshy lobes on the lips, which they press against the rocks.

A few scale-eating species exist, including an unidentified *Haplochromis* species which resembles a scale-eating member of the Mbuna Group, *Genyochromis mento*, *H. welcommei* from Lake Victoria rasps small scales from the victim's caudal fin.

A group of zooplankton feeders, called Utaka, and comprising various species of *Haplochromis* occurs in shoals in the northern part of Lake Malawi. Zooplankton is composed mostly of crustaceans, so presumably members of this group, e.g., *H. eucinostomus*, *H. intermedius*, would take well to *Daphnia* and *Cyclops*.

The fish vary in size from 6-25 cm. (2½-10 in.). Many of them have never been tank-bred, mostly because only a limited number have been imported and the high price discourages buyers. A special aquarium for one species of fish is perhaps the best set-up but different species can be kept together as long as regard is given to the needs of each species.

A special aquarium for e.g. *Hemihaplochromis multicolor* (generally regarded as quite a plain little fish) can be made beautiful and interesting. It is important to know how many fish and especially how many males one is going to keep when planning the tank so that a territory for each male is ensured. Three males and 4-6 females might be appropriate for a tank 100 x 35 x



30 cm. in size. Along the centre of the tank (fig. 3) one could place small tree roots, teak if possible, with in front of each root a separate area with gravel where each male can dig its hollow. In between the roots *Sagittaria*, heavily planted, will help mark the borders of each territory, and behind the roots tall plants, such as *Cryptocoryne*, *Vallisneria*, etc., will provide a good hiding-place for the females, and later for the fry. In a tank like this one will witness the males displaying their colours for the females, and defending the borders of their territory by squabbles with the other males. There will nearly always be a female with eggs in the mouth, and some of the baby fish at least will be sure to survive amongst the plants.

With bigger species as for example *H. burtoni*, a

slightly different set-up is required. *H. burtoni* love *Sagittaria* and *Vallisneria* so much that they eat them, so the plants required for a *burtoni* tank are the large species of *Echinodorus*, with in between a few flat stones or bits of slate for *burtoni* to spawn upon. A tank with three or four males and five to eight females is a good arrangement.

If one can afford to keep some of the bigger species, for instance *H. eichilus*, *H. moori* or *H. johnstoni*, then one needs a tank with a capacity greater than 100 litres (25 gallons). If one has in mind a fish with specialised eating habits, e.g., a snail-eating species, then one should first ensure that one can obtain the required food before obtaining the fish. The same requirements for large stones and plants apply here, and similar opportunity for digging is necessary. The habits of *H. moori* from Lake Malawi are particularly interesting as in nature it accompanies a digging fish, often *H. nostratus*, and consumes microscopic food particles from the cloud of dust whirled up by its host. Besides this peculiarity of behaviour, it is noteworthy not only by its bright blue colour but by a hunch on the head which gives it a rather strange appearance.

H. acidens from Lake Victoria, although related to piscivores, feeds mostly on higher plants.

There are a few hundred species of *Haplochromis*, many not yet classified. Some of these grow very slowly, reaching a length of 10 cm. (4 in.) in three years, of which certain species cannot breed until they reach this age and size.

Mbuna Group

The fourth group includes both the Mbuna group from Lake Malawi and similar species mostly from the *Tropheus* genus from Lake Tanganyika. The Mbuna group is a collection of fish from different genera which have developed from *Haplochromis*, and which live in the rocky coast area of Lake Malawi. Those from Lake Tanganyika, e.g., *T. moori* and *T. duboisi*, have also developed from *Haplochromis*.

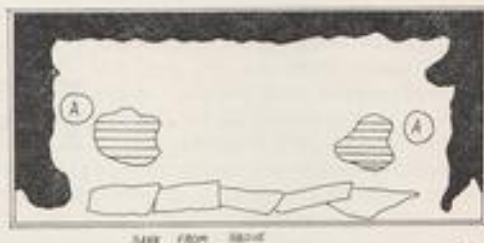
Most of these fish are bright in colouring, e.g., *Pseudotropheus auratus*, relatively small, 8-15 cm. (3-6 in.), and are epilithic algae feeders, i.e., they feed on algae growing on rocks.

Pseudotropheus tropheops, *P. zebra* and *P. fuscus* have quite differing teeth and mouths. *P. tropheops* can rasp firmly attached algae from the rocks while *P. zebra* removes less firmly attached forms. *P. fuscus* has teeth more similar to those of *P. tropheops* but tends to take single nips of algae and cannot remove it as effectively as the latter. Members of the *Labotropheus* genus, e.g., *L. fuelleborni* and *L. trewavasae*, possess a ventrally situated mouth which makes for a very efficient scraping of algae.

Cynotilapia afra is a fish which lives together with the Mbuna group, although found a bit farther off-

shore, which has gone over to zooplankton feeding, although it occasionally collects larvae from the rocks.

These fish will naturally feel most at home in a tank with plenty of rocks or stones. If plenty of light is given, all the stones will shortly be covered with a layer of green algae which will serve as food for the fish, and which will contrast beautifully with the colours of the fish.



One can use one's imagination when setting up the tank, as it need not of course be set up in any particular way. However, one idea (fig. 4) is to build up along the side and back walls of the tank an imitation rocky coast by means of large stones, either placed securely on top of each other or glued together with silicone glue. Beside the front glass at each side there might be a hideout for harassed fish. In the centre of the tank one could place two stones two-thirds as tall as the tank itself. These would serve two purposes: they would make the tank look wider and would be ideal for battling fish to swim around. Along the front glass flat stones could be placed on top of each other forming small caves a few centimetres from the glass. Surviving baby fish can hide here where the parents and other fish will have difficulty following them. The remaining of the bottom space in the tank is filled up with gravel, with possibly a large Amazon sword plant, e.g., *E. brevipedicellatus* or *E. paniculatus* planted at each side of the tank, providing amongst their leaves even more hiding-places.

With all these heavy stones in the tank one might feel safer if the tank bottom were not made of glass and if large stones have to lean at the back or at the side glass, then the best solution might be a wooden aquarium with glass only at the front.

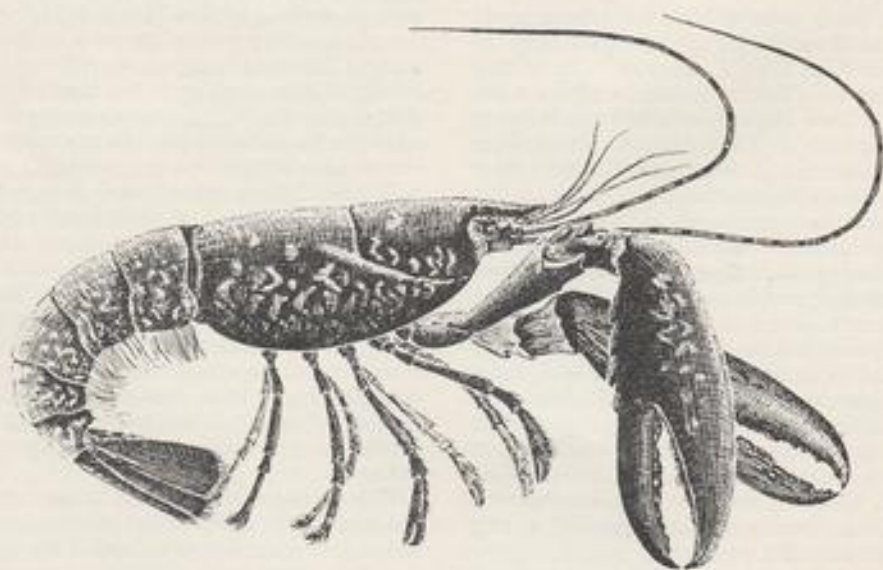
WHY NOT SPECIALISE IN LOBSTERS?

by Bill Simms

THE cold-water marine aquarist who lives within a reasonable distance of the coast is particularly favoured, for he can easily acquire many kinds of marine creatures—apart from fish. Sedentary creatures such as anemones are favoured by many, but aquarists who can set up a larger marine aquarium are often attracted

by crustaceans, and a few specialise in one or two of the larger specimens. A large tank with a good rock arrangement can house a few of our lobsters and among these are some of the most interesting of all sea creatures.

Of course, the water must be clean and regularly



Common lobster, (*Homarus vulgaris*)



renewed, but what is sometimes forgotten about cold marine aquariums is that they must be cold. This is just as important as plenty of aeration, and anyone contemplating the housing of native sea creatures should consider this point in relation to the siting of the aquarium before any other. Light, aeration, and fresh sea water can easily be arranged, but to ensure that the water does not gradually become too warm is another matter. I have heard of ice cubes from the fridge being dropped in regularly, but think this to be a most chancy method of temperature reduction. It is better to choose a position—such as near a north-facing window in a room that is never heated—where the temperature of the water will normally remain reasonably cold.

To anyone attracted by the idea of keeping lobsters but who has in mind only those fully grown ones

usually seen on the fishmonger's slab, it should be pointed out that these have grown up over the years from much smaller young ones. An obvious point, perhaps, but one that is often forgotten. Young small lobsters are easy to keep in suitable conditions and are often more interesting than the larger adults.

Very often the species of lobster kept will be dictated by what is immediately available, and in many cases this will be the common lobster. There are other kinds, however, and a little effort can produce some interesting varieties. Our common lobster can vary in colour and character according to the area from which it comes. Always it is mainly bluish-black and slightly spotty, but the basic colour of the common lobster is a pale reddish-yellow covered by bluish-black spots that merge together to hide the basic colour. It is in the degree of dark-spot merging that these creatures reveal their differences. The lobster is not a great wanderer and rarely moves many miles from its original area, and so the slight differences of one area from another are preserved. There are older lobster fishermen who claim to be able to tell within a few miles where any lobster they see comes from. These differences are slight, though, and need an expert's eye.

If you can obtain small two or three inch specimens of the common lobster a reasonably sized aquarium will house them. Feeding all crustaceans is a simple



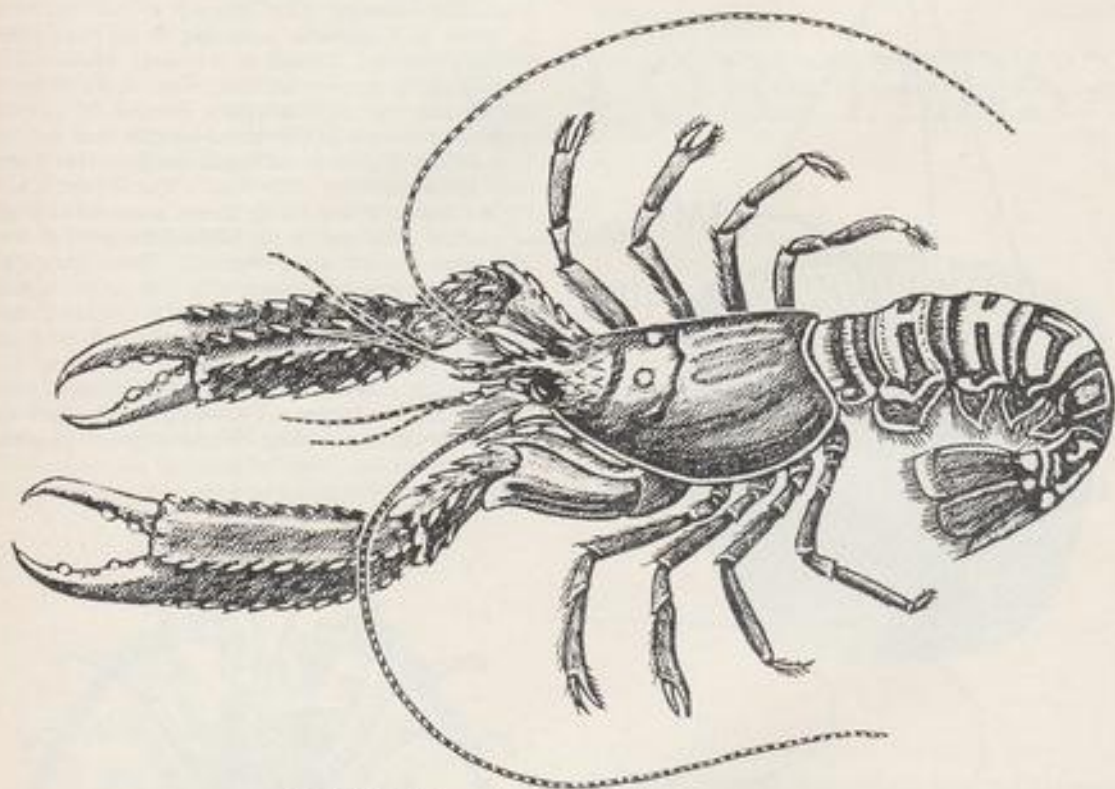
Spiny lobster, (*Palinurus vulgaris*)

matter for they eat pieces of fish, and the parts we normally do not eat can be used to feed them. It is essential, though, to make certain that no uneaten portions of raw fish are allowed to remain in the water to decay there. A good large filter helps, but regular changes of the water are better.

Catching your lobster is another matter. The usual lobster-pot is far too large for the ones you want, and requires far too much trouble to set and collect,

left for about ten or fifteen minutes to allow creatures to gather around the bait, holding the main cord in your hand as still as possible. At the end of the waiting period you start to haul in as rapidly and evenly as possible, trying to ensure that the even rush of water through the net keeps all creatures pressed firmly to the net bottom.

This is a really good way of catching marine creatures that frequent the bottom, and I have had



Norway lobster

so a better method is to use a hoop-net. This consists of an iron ring about 3 ft. across from which is suspended a semi-circular net with a fine mesh (you want to catch small creatures). Across the iron ring is a bait-holder, usually made from a double piece of string along which can be pushed string loops to trap the bait. Three equally spaced cords go up to a cork float that is designed to keep the three supporting cords clear of the bait, and up from this cork runs a stout cord for hauling up the net.

In practice you bait the net well, and lower it until you can feel that the ring is properly on the bottom with the net crumpled below it. There it is

some astonishing catches with the one I use. Obviously it must be used in a place where one can remain poised over relatively deep water for some time, such as from a pier end or a harbour wall, but with care it can be used from a boat also.

The great variety of creatures such a net catches will astound you, for on the first haul up you could find shore crabs, prawns, small fishes, and slower-moving things such as starfishes, as well as a host of less usual animals. To ensure better baiting I usually crush the small shore crabs in the net to be lowered next time, and this often produces more varieties. It should not be long under these con-



Squat lobster (*Galathea strigosa*)

ditions before you secure a small lobster or two, but if you fail, then try another spot, and note the vast difference in the catch.

In a suitable place you may catch the Norway lobster, or Dublin prawn, known to restaurant frequenters as Scampi. This delightfully marked lobster ranges all around our coast, though usually in deeper water than the common lobster and generally it is more common in the north than the south. It is pale flesh-coloured, marked with light brown, with the abdomen and tail beautifully sculptured. A small specimen of this—it can grow to 15 in. or so including its long front claws—can add grace to any aquarium. Thoses long and slender front claws are usually uneven in length, sometimes with the right one being the longer, and sometimes the left. The claws and the front of the body are well equipped with plenty of spines.

A completely different-looking lobster, mainly because of its small front legs, is the common Spiny lobster. This has all its five pairs of legs about the same size so that at first it may not be recognised as a lobster. To compensate for the absence of the usually formidable fighting and grasping front claws of other lobsters, it has unusually long

feelers, and these are kept well out in front or to the side and back. In character this lobster is quite different from the other two mentioned, for it is extremely retiring, and the two feelers are constantly in motion, searching out possible sources of danger as well as seeking food.

This is a purplish-brown lobster, usually marked with irregular white spots, while the legs are reddish in tone and sometimes banded with brown. All over the body are numerous spiny projections which must help to protect it from enemies. In an aquarium it is not truly happy unless a suitably sized cave of rocks is provided, though it will make do with plenty of seaweed in which to hide. Normally this lobster is more common around our south and west coasts than farther north, and is more often found at the edges of rocky under-sea patches where it competes with crabs for its food. To catch one of these in the hoop-net requires a fairly swift hauling-up operation, for it has a powerful tail and can soon flip itself out of danger.

A much smaller lobster than the others is the Squat lobster for it rarely grows much above 3 in. long, and is usually much smaller. This one is greenish red-brown, and its legs are unlike those of most lobsters. The front pair are well equipped with claws and are larger than the others, but the next three pairs run them close in size—though without the grasping claws. All these four pairs are well covered with spines, and make this small lobster look really formidable, particularly when combined with its short, squat body. The hind pair of legs are so small and thin as to be almost unnoticeable, and at first sight this lobster appears to have only four pairs of legs.

The squat lobster is fairly common around our south and west coasts, and particularly around Ireland. The marine aquarist without a hoop-net may find this one of the easiest to obtain, for small specimens can often be found under rocks on the lower shore. It is not confined to the beaches, however, for it frequents deeper water and I have often caught one in a hoop-net. It is an admirable species for the aquarium.

One point should be remembered about lobsters—they can give a serious nip with those front claws, and so must be handled with care. Grasping them across the back with thumb and fingers located near the base of the front claws is safe, but I advise you to get the feel of this by handling dead lobsters first. (You can always pretend to the fishmonger that you may buy one).

In addition, remember that lobsters can cast a claw very easily, and will do this if handled too roughly. It will be seen that there are a few difficulties about keeping lobsters, even after you have caught them, but the delight of seeing them in a well-kept aquarium is considerable. Try it, and join the ranks of the specialists.

THE HARDY EUROPEAN
REPTILES AND AMPHIBIANS
IN CAPTIVITY (Part 20)

by Andrew Allen

42. The Slow-worm (*Anguis fragilis fragilis*)

Description.—The Slow-worm may grow to beyond 50cms. in length. It is snake-like in form with a very long tapering tail. The scales are very small, imparting a smooth, polished texture to the body. It is readily distinguished from any snake by its movable eyelids, broad tongue and external ear openings. Dorsal coloration ranges from yellow through brown and red to grey. It is uniform in the male, but there may be a black vertebral stripe and other dark stripes in the female. Ventral colouration is grey or steel-blue. Males may occur as 'Blue-Spotted Slow-worms,' once classified as a distinct species.

Distribution.—This is a familiar lizard almost throughout Central and Western Europe, including much of the British Isles, the Alps and Carpathians. It occurs in brush, woodland, meadow, heath, moor and hedgerow, frequenting damp or dry habitats up to two thousand metres or more in altitude.

Breeding Habits.—Up to thirty young are produced in the late Summer. The species is ovo-viviparous the baby lizards speedily freeing themselves from their egg membranes.

Care in Captivity.—*A. fragilis* requires very different conditions from the other lizards previously considered in this series. It is far less mobile, takes different prey, favours slightly different habitats, and has little love of the sun. In consequence it needs specialized, but not demanding treatment.

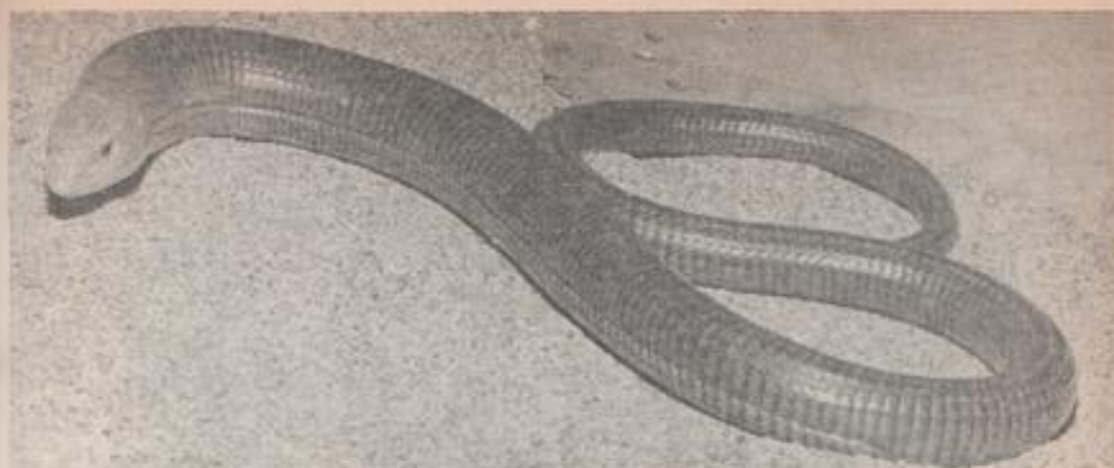
Indoors it is an acquiescent animal. It will survive in restricted, ill-designed vivaria that no other lizard would tolerate. It will live on an unvaried diet that would speedily finish off a Green or Ruin lizard. But this provides absolutely no excuse for actually treating it thus. It should have a medium-sized vivarium that has a limited exposure to the sun. There should be a small water bowl, a deep layer of soft, faintly moist soil, some dense vegetation and a

good number of hiding places in the form of washed cork-bark, stones and fragments of clay flowerpot. The inhabitants will over-winter happily, but are better hibernated. Supplementary heat and light are usually unnecessary; indeed this lizard will not enjoy great warmth. It is very hardy, and so not perfectly suited to a centrally heated living room. Moderate temperatures are to be preferred, and sharp fluctuations should be avoided.

Though it does well indoors, these are not ideal conditions. It is hardy enough to house in the garden under a regime that will be much more to its tastes. In a 'wild' garden or one with spacious rockeries it would be best just to release half-a-dozen specimens and let nature take her course. They will work wonders with your slug population! Alternatively they can be released in an outdoor reptiliary. Their mobility is so restricted that there need be few fears of their escaping. Given an unspecialized environment and good companions they should live for many years.

Their adaptability is such that they will also prosper in a greenhouse, even if it is designed with sun-loving lacertids in mind. But they will not enjoy the great heat, and the protection afforded against inclement weather is clearly superfluous to this thoroughly hardy species.

Slow-worms are extremely conservative in their diet. Firm favourites are white slugs (*Agrotimax agrestis*), followed at a great distance by black (*Milax sps*) and other slugs. Earthworms are tolerated, as are blowfly maggots and a number of other insect larvae. Small snails may also be taken. All prey is stalked slowly and ponderously, before being seized with the utmost deliberation. On the whole Slow-worms are very simple to feed, and rarely go on hunger strikes. The one cardinal rule to remember is that a steady supply of white slugs is the surest route to a Slow-worm's heart!



Glass Snake

This is an admirable inmate of a community vivarium, molesting few of its companions, but equally being safe from molestation itself. Report has it that small frogs, toads and newts may be attacked; I have never personally found this, but mention the point in passing. In general it may be housed with all the smaller Reptiles and Amphibians. It should not be left at the mercy of any snakes, of Eyed lizards or Glass snakes, of large terrapins, or of Marsh and Edible frogs. But otherwise there are very few restrictions, and it can be confidently integrated into almost any community.

The above remarks most certainly do not apply to baby Slow-worms. These bear a considerable resemblance to a juicy and tempting earthworm. Accordingly they may fall foul of just about every Reptile and Amphibian on the face of the earth. It is kindest to remove them from all company (including that of their parents) until they have grown enough to fend for themselves.

The Slow-worm is not the most exciting of Reptiles. It is cumbersome and clumsy compared with most lizards, and its colours are muted. In addition it passes a very quiet life, spending much of its time in hiding. But it is easy to keep, and has a distinct interest of its own that makes its observation rewarding.

Like most members of our native herpetofauna *A. fragilis* is a threatened species. Though far from rare as yet, its status has deteriorated in several parts of the country. The responsible herpetologist should do nothing liable to further imperil its position. This means that specimens should not be collected in the field, and that any young bred in the vivarium should be liberated on some chosen heath or bank. If the vivarium owner is well intentioned he should be able to formulate his own code of conduct towards

native and European species, and aid actively in their conservation for the future.

Anguis f. peloponnesiacus comes from the Peloponnesus, whilst *A. f. colchicus* is an important subspecies from South-East Europe.

43. The Glass Snake or Scheltopusik (*Ophisaurus apodus*)

Description.—With lengths exceeding 100cms. this is the giant of European lizards. Its rounded body is snake-like, though rudiments of the hind limbs are visible upon close scrutiny. The large head is distinct from the body, while the tail is long. There is a characteristic furrow down each flank, extending as far as the cloaca. Adults are yellow, brown or even red, with few distinct markings. Juveniles are grey above, white below, with a variety of brown patches and stripes.

Distribution.—The Glass snake is a South-East European species, occurring in the Balkans, Caucasus, Crimea and Asia Minor. It favours similar, though often drier and rockier, country to the Slow-worm. This includes hillsides, fields, hedgerows and sparse woodlands.

Breeding Habits.—Unlike the Slow-worm this member of the Anguillidae is oviparous.

Care in Captivity.—Glass snakes bear many resemblances to the Slow-worm, and this extends to their care in captivity.

They will fare quite comfortably in the indoor vivarium, which is best maintained at a temperature of 75-80°F, showing a tolerance similar to that of their close relative. However, they are very large and bulky, and so an exceptionally spacious vivarium is imperative (one of thirty square feet floor area would suit the needs of a true pair). Vertical dimensions are not so crucial, for Glass snakes are only

moderate climbers. Sunlight must shine into some corner of the vivarium, and drinking water must always be present. Some capacious hiding places should be provided. The species can be overwintered or hibernated with almost equal ease and confidence.

Glass snakes are an exclusively Southern species, and can only truly be classified as semi-hardy. It would be unwise to house them in an outdoor reptiliary, except perhaps in the very mildest parts of the country. Any reptiliary should be well sheltered,

snakes have also been known to plunder Bird and Reptile eggs. This suggests that raw egg could be a useful stand-by for times of shortage. Raw meat and liver may be eaten, but are best reserved for emergencies alone as they are inferior on most counts to natural insect or vertebrate fare. Despite their appearance these animals can be very active predators, capable of a considerable turn of speed over a short period.

Such feeding habits do not recommend Glass snakes as community animals. They should be



Slow worms of varying ages

of sunny aspect, and have a deep, carefully insulated hibernating chamber.

Preferable would be a large greenhouse, which would give some much appreciated extra warmth. This also should have a stout hibernating chamber, or alternatively a very deep substratum of soft soil suitable for burrowing.

As befits its considerable bulk, it has a lusty and substantial appetite. Adults will take many small vertebrates, especially fledgelings, lizards, some snakes and mice. But happily for those of tender disposition it will also take more traditional prey such as grasshoppers, large worms, slugs and snails. All of these are easily provided, and grasshoppers can be bred in quantity in the form of locusts. Glass

houses with nothing smaller than themselves. This restriction still leaves a fair number of large Reptiles as potential companions, including most Chelonians (i.e., terrapins and land and water tortoises), Eyed lizards and the majority of adult European snakes.

Success with this species does require the devotion of a fair amount of time and money. Glass snakes are not cheap to buy initially, nor are their probable companions, and they do demand the most spacious of conditions. But those with all the necessary experience and qualifications will discover that they pose a minimum of problems, and are essentially no more difficult than their humble cousins the Slow-worms.

There are no sub-species.



THE WATER-VOLE

by David Wareham

Illustrated by Bill Simms

THE WATER VOLE (*Arvicola amphibius*) occurs widely over much of England and Scotland. In Wales it is rarer in the south, and it is altogether absent from Ireland. Although it is not completely aquatic it is, like the water shrew, closely associated with water, living in the vicinity of streams, brooks and canals. It is also quite common on marshes and in damp meadows, and it occasionally visits large gardens. An average specimen has a body length of six to seven inches and a tail of four to five inches, although larger specimens are found from time to time. With the exception of the introduced muskrat, the water vole is the largest of the European voles.

In certain parts of the country the water vole has

been given the name of brown water rat; rather unfortunate perhaps, for this harmless and retiring creature has none of the unpleasant habits of the infamous brown rat. Although there may be a vague similarity in the two species when seen for a fleeting moment amongst the undergrowth, the differences become obvious when observed at close quarters. Unlike the rat, the head of the water vole is more rounded and the muzzle, instead of being pointed, is rather blunt. The limbs are much shorter in the vole and the ears are small and almost hidden in the fur. The overall colour of the water vole is a warm reddish brown, although this may vary from one specimen to another, from a golden brown to almost black. The

tail is covered with short dark hairs and the tip is very often lighter in colour.

The water vole is one of the few British mammals that can be observed with comparative ease during the hours of daylight, and it is for this reason that it is probably one of the best known. Most of the vole's activities are carried out during the day, but it can be met with at all hours. On the whole it is a silent animal, but a variety of squeaks and whistles are made particularly when it is alarmed or angry.

An excellent swimmer and diver, the water vole swims frequently and can remain submerged for long periods. In winter it has even been seen swimming beneath ice. The vole's diet consists mainly of aquatic plants, grasses and the young shoots of bushes and trees. At times it will take certain insects, and in late summer young frogs are frequently taken. Molluscs and small crayfish are caught and devoured in places where these occur, and a water vole can often be seen swimming on the bottom of a stream, searching amongst the stones and mud for such creatures.

Sometimes long and intricate tunnels are excavated in a river bank, usually with at least one entrance hole beneath the water, and many of the tunnels are equipped with ventilation shafts. In late March and early April the water vole constructs a large, loose ball of grass and reeds, generally in one of the tunnels, but sometimes in a hollow tree. In this nest the young are born, with as many as nine in a litter. At birth the young are naked and blind, but after three to four weeks they start to run around in or near the nest and fully able to swim soon take to the water. There are usually three to four litters in a year.

The water vole does not hibernate and is active throughout the year. In extremely cold weather, however, it will very often return to the nest, where it has sometimes built up a considerable store of food

beforehand, and use it as sleeping quarters.

Records and observations show that the water vole seems to be rather short lived, with an expected life span of eighteen to twenty months and, in exceptional case, two years. It has many enemies apart from man and other than the obvious predators such as owls and hawks, the heron probably accounts for the largest number. Eels, pike, and large trout are also known to take water voles from time to time. The water vole has two musk glands on the abdomen, positioned between the hind legs, but these seem to give the animal little protection against its enemies.

The water vole is often accused of stealing eggs from the nests of wild duck and other water birds, but these crimes, it has been found, are generally committed by the brown rat with which it is so often confused. Because of this confusion water voles are continuously trapped, shot and poisoned, which is a great pity because these attractive and interesting mammals can only be held responsible for very small and isolated amounts of damage, and in no way do they interfere with fish or fishing, as is often thought. Probably the only time that the water vole does give cause for concern is when periodically its numbers increase, sometimes rather dramatically, and their numerous tunnels then threaten the safety of a river bank.

Discovering whether water voles are present on a certain stretch of river is not difficult, as you only have to look for the telltale holes in the bank. Very often you hear a water vole before you see it. This is because if one is suddenly disturbed whilst feeding it will quickly disappear into the water with a loud "plop." Once you know a vole is there, all you have to do is sit down and wait, and before long it will reappear and carry on with its day-to-day duties seemingly unaware that it is being watched.



ADVANCE NOTICE

THE FEDERATION OF SCOTTISH AQUARIST SOCIETIES
are happy to announce

THE 2nd SCOTTISH AQUARISTS' FESTIVAL

will be held at the CIVIC CENTRE, MOTHERWELL near GLASGOW

on

SATURDAY AND SUNDAY - 13th, 14th APRIL, 1974

FURTHER DETAILS SHORTLY

ANSWER TO WHAT AM I? FILTER GRAVEL.

PIRANHAS

by R. J. Davis (aged 15 years)

THE PIRANHA is shrouded in myth; any aquarist trying to penetrate this myth to find the facts about the practical keeping of piranhas has a very difficult task. This general lack of information is the reason that many aquarists are dissuaded from buying this beautiful and worthwhile fish.

Piranhas are carnivorous characins of the sub-family *Serrasalminae*, the herbivorous members being referred to as pacus. These piranhas can be split up into Pirambeba (or 'false piranhas') and Piranhas (the 'true piranhas'); the latter being the subject of this article. There are many species of Pirambeba, but only four species of Piranha, namely: *Serrasalmus piraya*; *S. ternetzi*; *S. niger* and *S. nattereri*. All the piranhas live in the rivers and streams of South America.

The main feature of all Piranhas and Pirambebas are their teeth. They have only one row of very sharp, triangular teeth in each jaw. When these jaws are brought together the teeth interlock perfectly. The function of these teeth is only for biting off pieces of prey, not for holding or chewing. Piranhas have relatively small mouths and consequently they take small, strap-like bites which they swallow almost immediately. The word piranha has two meanings in some native languages of South America 'the fish' and 'scissors'. In these lands a piranha jaw is used as a cutting tool.

The physical differences between the Piranhas and Pirambebas are that: Piranhas usually attain a greater size; they have a near discoid body while that of the Pirambeba is more oval and elongate; they have a blunter head with a very small snout if any at all, but the Pirambebas have a snout, varying in size according to species. Piranha jaws are much stronger

and Piranhas have a more malignant and muscular look about them.

Of the four species *S. piraya* is the largest, growing to about two feet in length, and therefore the most dangerous. They conform to the description of a Piranha, having no snout at all. They are a generally silvery fish with a peculiarity: the adipose fin has well developed rays. This species is not very common and I have never seen one.

S. ternetzi is very similar to *S. piraya*, but it only grows to ten inches. It too is not very common and again I have never seen one.

The next two species are more common. The first *S. niger*, the 'black piranha' grows to fourteen inches long. It is a brownish-blackish colour with many contrasting red lustres on random scales, making this fish very beautiful. The lower lobe of the caudal fin is larger than the upper. Its snout is not as blunt and short as that of the other three. I have never seen this fish offered for sale, but I have observed a specimen at the Paris aquarium.

The last and most well-known Piranha—due to its wide distribution—is *S. nattereri*, the 'red piranha'. This beautiful, silvery fish has a red sheen, extending from the lower jaw along the lower part of the body, up to and including the anal fin, extending up to the lower half of the gill-plate. Its blunt face and large eyes give it an almost stupid look. The 'red piranha' grows to about ten inches long. This is the species most widely available to the aquarist and the one that I possess.

The Piranha is a territorial, shoaling fish. One shoal will control a stretch of river. They prefer the deeper eddies where they are out of the strong currents of the river. The fish in the shoal seem to be wary of each other, as if each knows the other's

potential and is making plans for self-defence. They do not like fish swimming immediately behind them, from where they may suddenly attack unseen. When food—normally a shoal of small fish, an old or sick fish, or a splashing terrestrial animal that had fallen into the water—appears their fear of each other is forgotten. The fish swim quickly to attack and eat as quickly as possible. The presence of blood in the water acts as a stimulus to feeding. When blood appears in the water or, alternatively after the first bit, the attack becomes a frenzy and the water becomes thick with fish snapping at anything and everything. In a normal shoal bites in the fins constantly appear, but become no worse. When the feeding reaches the climax described, the fish will often bite one another by mistake. The injured and bleeding Piranha is then eaten along with the prey. Piranhas are attracted by splashing and vibration because they have nothing to fear. Apart from man they have no enemies and usually these disturbances mean food; the inquisitive Piranha cannot lose by investigating.

I have no practical experience of Piranha spawnings, but reports state that they spawn in a cichlid-like manner, laying about 5,000 adhesive eggs over plants. At least one parent guards the eggs and fry with great ferocity. In the wild they spawn between December and March, when the water-level in the rivers rises.

The following information on keeping Piranhas applies equally to the Pirambebas.

When buying Piranhas you should buy young fish of under two inches. This practice has several advantages: it is easier to condition a young fish into your routine and to eat what foods you supply; a small Piranha is easier to look after than a large one so that when your Piranha grows to a larger fish you will have had enough experience to cope with it; it will live longer, and last but not least, Piranhas are expensive fish, but a small one will cost at most one tenth of the cost of a large one. There is one disadvantage, a large Piranha is fairly easy to identify, but a small one is almost impossible. The usual Piranhas for sale are *S.nattereri* (a Piranha) and *S.brandtii*, *S.hollandi*, *S.rhombus* and *S.spilopleura* (Pirambebas). If you buy a small one you will have to wait for it to grow before identification of it as a Piranha or Pirambeba.

Piranhas and Pirambebas should be kept in shoals of at least ten fish or singly. The latter is usually easier. A piranha shoal needs a large tank and the Piranhas will never be in their best condition because of fin-bites. If a shoal less than ten fish is kept, it will result in the loss of at least one fish. Fish being kept singly should be kept in a tank of four feet long, fifteen inches high and eighteen inches wide. The extra width is necessary for turning.

Piranhas can be kept in smaller tanks, but the tank size I have suggested takes account of their need for swimming space.

Tank ornaments should include gravel and a few large, well rooted plants. Piranhas and Pirambebas will not eat plants but their powerful tail can destroy a fragile plant. Be careful to place these plants so as to provide refuge, but not to obstruct swimming areas. Rocks should not be used because they will only get in the way of a Piranha's swimming place and so injure it. Lighting is not important, but provide enough for the fish to see and for the plants to grow. Water quality is not particularly important either, but should be well filtered. For breeding an increase in the water's softness may stimulate spawning—Piranhas spawn when the water-level rises due to rain. Piranhas are hardy fish with a large temperature range, but they do best at between 75°F and 80°F.

Feeding Piranhas and Pirambebas is of prime importance. They should be fed a wide variety of meat, fish, vegetables and dried flake-food. I feed: ox heart, cod, white worm, garden worms, maggots, baby convict chichlids, peas (only the soft, boiled inside), cabbage (boiled until soft), maxiflakes, dried fish-food and *Tubifex*, glass worms and *Daphnia* can be fed to small fish, but they are not taken with equal enthusiasm.

The proportion of meat, fish and worms should exceed everything else because, above all, Piranhas are carnivorous. The vegetables and dried fish-food are necessary to provide the balance of vitamins and minerals. The live-fish are not an important part of the diet.

Although Piranhas and Pirambebas do possess jaws of amazing potential, I find that my Piranha prefers to have its food ready cut up into pieces that it can easily swallow. My Piranha takes its food as it drops through the water. Dried flakes should be placed, singly on the water and allow to sink; the flake is then taken. A small fish will take several bites as the flake drops. The next piece of food should not be presented until the old piece is eaten. Piranhas and Pirambebas have tremendous appetites, but should not be satisfied at one sitting, rather at several small sessions. In this way large amounts of food can be presented without gorging the fish.

Piranhas and Pirambebas seem to be very hardy and free from disease, but they may get fungus from wounds suffered while swimming into tank sides and rocks at speed. Hence the importance of not using rocks.

Finally, a note of caution, when handling and feeding all Piranhas and Pirambebas great care should be taken—even the smallest of the Pirambeba could give a nasty bite.

THE GARDEN POND IN WINTER TO FEED OR NOT TO FEED

by Arthur Boarder

THE problem of feeding goldfish and other types of fishes kept in garden ponds arises each winter and this is especially so with newcomers to the hobby. During the past few years the numbers of pondkeepers who have joined our ranks has increased out of all proportions to those of any corresponding term of years before. This is without doubt because of the introduction of the pond liners which has taken out so much of the hard work previously necessary. The concrete pond required really hard work, not only in digging out the hole but the turning of the sand, aggregate and cement three times dry and three times wet. Then there was the actual application which could induce plenty of backache for the pondmaker.

Nowadays all that is required is to dig the hole insert the liner with anchorage at the sides, fill with water and the task is completed. It is now possible to make a pond, plant it and stock it in one day. Not that I recommend the actual stocking with fishes until a few days have elapsed. Once the fishes are in the pond the enthusiastic owner will immediately start to feed the occupants. This is, of course, quite wrong but I know of no one who would take this advice as a beginner. It is thought that the fishes *must* be fed immediately and then every day, perhaps two or three times, more food must be added. There is no doubt in my mind that more ponds go wrong through over-feeding than from any other cause.

Even if the feeding problems have been overcome during the warmer months of the year, it is often found that many newcomers have no idea about feeding during the winter. Some books advocate that the fishes should not be fed at all during this time whilst others suggest that a judicious feeding will do no harm. I have sometimes left my pond fishes unfed through most of the winter whilst at other times they have been fed very little on occasions. The type of weather

being experienced will regulate the amount of food and its frequency.

Let us now examine the feeding habits of goldfish, and by this I include all the fancy varieties. None have a large stomach like a perch or pike and so cannot take a large meal at a time. Supposing that a goldfish could eat a tablespoon of food in a day, it would be quite impossible for that fish to take this amount at one feeding. At hourly or two hourly intervals a fish could eat a large quantity providing the water was in good condition. It may seem strange to newcomers to compare the condition of the water with the amount of food which a goldfish will eat, but it is a fact that without a fair amount of oxygen in the water the fish cannot digest its food and so if more is given before the first lot is cleared up, the water soon becomes polluted, loses much of its oxygen and the fish are in trouble.

We know that cold water contains more oxygen than warm and so one would expect that the fish become more hungry in the cold weather. This is so to a certain extent but they also become much more sluggish as the water cools down and so take much longer to digest their food than they would when the water was warmer. The difference in the actual feeding of the goldfish during cold weather to that when it is warm can be noticed quite easily.

When the water is warm and contains plenty of oxygen the fish will take the food from the surface with a quite quick snatch. Compare this with the way the food is taken once the water cools down. The fish will gradually rise to a pellet and with a very quiet suck take the food and even may make two or three goes at taking it. A thermometer in the pond before feeding during the winter will indicate whether the fish are likely to feed well or not. Once November is over it will not be essential to feed the fish at all

until about March. They will go through the winter quite safely in a medium or large pond with no artificial feeding. Should too much food be given then the water could soon turn foul, although being cold it is likely to take a little longer than when the water was warm.

The question may be asked as to how cold the water must be before goldfish cease to feed at all. I am not sure what this is but I know that on several occasions my fantails have taken broken garden worms when there has been ice on the pond. The live food is, of course, better to give if any is given at all, than dried foods. Whatever food is taken by the fish will take much longer to be digested than when the water was warmer, but I still do not consider it absolutely necessary to give any extra food at all if the weather is very cold. I say extra food as it must be remembered that in a well planted pond there will always be something either vegetable or animal for the fish to eat at all times of the year.

BOOK REVIEW

Tropical Fish and Aquarium Plants Calendar, 1974, published by Tetra Werke, Germany, distributed by TetraMin UK Ltd., Colley Lane Industrial Estate, Bridgwater, Somerset. Available from either TetraMin UK Ltd. or Tropical Fish Hobbyists Shops, at 50p.

Tetra Werke, renowned all over the world for their many different kinds of fish foods, have for many years past published a very special kind of calendar. Now, for the first time, these calendars will also be available in the U.K. Their 1974 edition shows 13 different kinds of fishes and plants. The photographs were specially commissioned by Tetra Werke and the German photographer Herr Burkard Kahl must have taken great care to capture the vivid character of the various species of fishes in their settings. The smaller plant photographs were taken by the German plant expert Herr Kurt Paffrath.

The pictures of fish are 7 in. by 4½ in. and the colour reproduction is of the highest standard. It would be a great pity if these fine photographs were to end up in a waste paper basket; I suggest that they might be kept month by month and be filed away for future reference. They could even be framed.

On the back of each picture is a short but very useful description in German and English. The information includes the common and scientific names, origin, size, requirements regarding water condition and temperature, and a feeding schedule. (Tetra Werke can be forgiven for recommending mainly their own brand of foods.)

I am sure that hobbyists who see this calendar for the first time will want to have every future edition in order to collect excellent colour prints of some of the

For the beginner I recommend that no dried food is given to the fish in the pond after November and then none until March. The only exceptions I would make are that if there is a fairly mild spell, which often happens, and the fish become active a little food may be offered. If this is done, just throw a couple of pellets or other small bits of food on the surface and if this is not taken within a minute give no more for a few days. A clear pond in the beginning of the winter should remain so until the warmth of the spring unless uneaten food decays on the bottom and pollutes the water.

I have noticed that, in my pond, when the temperature of the water is about 75°F., and the water is in good condition the fish feed very well. They will continue to do so until the temperature drops to 50°F., when their appetites gradually decrease. At 40°F., I do not feed at all. I do not suggest that all fish will react in the same way, but from years of experience I have found this the case with my pond and fish.

most beautiful of tropical fishes. It would make a splendid Christmas present—even to oneself.

EBERHARD SCHULZE.

Marine Aquarium Keeping—The Science, Animals, and Art, S. Spotte, Wiley-Interscience, John Wiley & Sons Ltd., 171 pp., 1973, £5.

A new release by Wiley-Interscience, "Marine Aquarium Keeping" should be of considerable interest to all serious marine aquarists.

Mr. Spotte has been Curator of the New York Aquarium and is currently Director of Aquariums for Aquarium Systems Inc. with responsibility for the Niagara Falls, New York Aquarium and the Mystic, Connecticut Marinelife Aquarium.

In his new text, Mr. Spotte deals initially with the science of establishing a marine aquarium, describing the necessary equipment and explaining the principles of biological, mechanical and chemical filtration. He discusses the theoretical and practical aspects of controlling such key environmental factors as ammonia, nitrite, nitrate and oxygen levels.

The second section deals with marine vertebrates and invertebrates, giving helpful advice on how to select healthy specimens, how to acclimate new specimens, how to prepare and mix fish food for a balanced diet, and how to care for sick fishes. Some parasites and their mode of infection are described for the first time in a general reference book.

In the last section, the author describes several ways to decorate the aquarium, including a complete description of the professional techniques for moulding artificial coral from fibreglass.

The book is exceptionally well illustrated, with 15 colour plates, 65 black and white photographs, 23 drawings by the wildlife illustrator Frances McKittrick Watkins, and numerous diagrams and tables.



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.

THERE was a large attendance of members and visitors at the November meeting of the Gloucester Fishkeeping and Social Club when the new chairman opened the meeting. Mrs. E. Adlam welcomed the visitors who came to hear the results of the open home aquarium competition which was held and sponsored by the "Barrier Reef." This event was judged by Dennis Noble and Gordon Churchill who were both agreeably surprised by the high standard of the tanks entered. Gordon Churchill attended the meeting and also judged the table shows. Two of the members were placed first in the senior and junior sections of the aquarium competition and the full results were: Seniors: 1, A. Lamb; 2, P. Young; 3, M. Wasley; 4, Mrs. J. Williams. The junior section was won by C. Dyke, A. Perry being second and R. Bowd and A. Toomey third and fourth respectively.

The awards were presented by Mrs. R. Connetty and Mrs. I. Wilden, who are the wives of the proprietors of the "Barrier Reef." The club president, John Wyatt, made a short speech thanking the previous chairman, R. E. H. Moulder, for his services to the club and then presented him with a cheque. The youngest member Richard Bowd then gave Mr. Moulder an engraved club plaque. He was also made the first life member of the club. Table show results were: Livebearers: 1 and 2, J. Pinkney; 3 and 4, M. Burke. Coldwater show: 1 and 2, F. Palfrey; 3, Miss A. Holder; 4, R. Bowd. The club has been presented with another trophy by Gordon Mitchell which will be awarded to the winner of the "Fish of the Year" competition in October.

MORE than six hundred entries were received at the Newbury and District A.S. first open show held in September. Results were as follows: Class A: 1, Mrs. B. Jackson (Basingstoke); 2, Mrs. M. Blakemore (Newbury); 3, R. Mewitt (Amesbury); 4, Mrs. Dudley (S.P.A.S.S.). Class B: 1, D. R. Rhindell (Abingdon); 2, A. Marshall (Basingstoke); 3, R. Lefevre (K.D.A.S.); 4, K. Hillier (Newbury). Class C: 1, A. Blake (Basingstoke); 2, D. Mackay (K.D.A.S.); 3, A. Marshall (Basingstoke); 4, Mrs. D. Cruckshank (Ealing). Class D: 1, L. Little (Bracknell); 2, B. Binson (Basingstoke); 3, Mr. Elliott (Gosport); 4, D. Cruckshank (Ealing). Class E: 1, I. Jackson (Basingstoke); 2, Mr. Taylor; 3, B. Binson (Basingstoke); 4, L. Brazier (Sudbury). Class F: 1, Mrs. I. Strange (Basingstoke); 2, J. Pollard (Kingston); 3, A. Wedge (Southampton); 4, Mrs. J. Lloyds (Newbury). Class G: 1, 2 and 3, J. Nethersall (Riverside); 4, I. Pierce (High Wycombe). Class H: 1, A. Tull (Salisbury); 2, K. Binson (Basingstoke); 3, B. Binson (Basingstoke); 4, A. Blake (Basingstoke). Class I: 1, W. Ouslow (Ealing); 2, Mr. Hall (Abingdon); 3, Mr. Rees (Gosport); 4, Mrs. A. Blakemore (Newbury). Class J: 1, T. Taylor; 2, Mr. Hall (Abingdon); 3, D. Purchard (Tonbridge); 4, N. Wood (Gloucester). Class K: 1 and 2, D. Mackay (K.D.A.S.); 3, Mr. and Mrs. Murphy (Greenford); 4, Mrs. Newbury (Southampton). Class L: 1, J. Gerard (Ransymede); 2, Mr. Gibson (Reading); 3, M. Cott (Gosport); 4, Mrs. Newbury (Southampton). Class M: 1, Mrs. Nethersall (Riverside); 2, Mrs. Lewis (Sudbury); 3, B. Binson (Basingstoke); 4, Mrs. A. Blakemore (Newbury). Class N: 1, M.

Nethersall (Riverside); 2, A. Blake (Basingstoke); 3, Mrs. J. Lloyds (Newbury); 4, Mr. Knight (Gosport). Class O: 1, T. Pollard (Kingston); 2, D. Mackay (K.D.A.S.); 3, A. Blake (Basingstoke); 4, J. Clarke (Gosport). Class P: 1, Mr. Purchard (Tonbridge); 2, B. Binson (Basingstoke); 3, J. Jackson (Basingstoke); 4, Mrs. J. Garrad (Ransymede). Class Q: 1, Mrs. J. Lloyds (Newbury); 2, A. Blake (Basingstoke); 3, J. Wilson (Newbury); 4, R. Adams (Salisbury). Class R: 1, D. Purchard (Tonbridge); 2, Mr. Carnegie (Gosport); 3, J. Nethersall (Riverside); 4, Mr. Canning (Basingstoke). Class S: 1, Mrs. J. Lloyds (Newbury); 2 and 4, K. Hillier (Newbury); 3, T. Taylor. Class T: 1, A. Crew (W.A.D.A.S.); 2, Mrs. Canning (Basingstoke); 3, A. Watts (Didcot); 4, Mrs. Nethersall (Riverside). Class U: 1, Mr. and Mrs. Murphy (Greenford); 2, A. Watts (Didcot); 3, R. Adams (Salisbury); 4, E. Holmes (Banbury). Class V: 1, I. Pierce (High Wycombe); 2, W. Ouslow (Ealing); 3, J. Nethersall (Riverside); 4, K. Hillier (Newbury). Class W: 1, E. Cott (Gosport); 2, L. Little (Bracknell); 3, Mr. Lusby (Mid. Herts); 4, A. Blake (Basingstoke). Class X: 1, Mrs. Nethersall (Riverside); 2, Mr. Freemantle (Gosport); 3, A. Crew (W.A.D.A.S.); 4, B. Turner (Basingstoke). Class Y: 1 and 3, M. Strange (Basingstoke); 2, R. Ouslow (Basingstoke); 4, B. Binson (Basingstoke). Class Z: 1, R. Lowe; 2, D. Sheridan (Newbury); 3, G. Dixon (Newbury); 4, Mrs. A. Blakemore (Newbury). Class AA: 1, R. Ouslow (Basingstoke); 2, A. Tull (Salisbury); 3, E. Holmes (Banbury); 4, L. Little (Bracknell). Class AB: 1, R. Cowley (Gosport); 2 and 3, U. Vorsey; 4, D. Mackay (K.D.A.S.). Class AC: 1, Mr. Birstead (Perumouth); 2, R. Ouslow (Basingstoke); 3 and 4, J. Pollard (Kingston). Class AD: 1 and 3, A. Marshall (Basingstoke); 2, S. and D. Jackson (Basingstoke); 4, E. Hitchcock. Class AE: 1 and 3, V. Hunt (Havant); 2, N. Wood (Gloucester); 4, R. Lefevre (K.D.A.S.). Class AF: 1, V. Hunt (Havant); 2, Mr. Dudley (S.P.A.D.S.); 3, G. Herring (S.P.A.D.S.).

OFFICERS elected at the annual general meeting of the Lincoln and District A.S. were as follows: president, H. Kuhn; treasurer, Mr. Kennaugh. The club would like to express their thanks for all the hard work done by T. Dobbs, the retired president, E. Croker, the treasurer, and R. Peach, the news editor. Meetings are held the third Monday in each month at the Liberal Club, St. Swinburn Square, Lincoln at 7.30 p.m. New members welcome.

RESULTS of the Severnside Aquarists Association show held in Bristol in October were as follows: Fighters: 1, P. Greenwood (Bishops Cleeve); 2, M. Toomey (Glos. P.K. & Soc.); 3, A. Gilbert (B.T.F.C.); 4, Mrs. E. Daniels (Whiteaway). Labyrinths: 1, J. Ferguson (Bath); 2, S. Green (Yate); 3, R. Lawrence (B.T.F.C.); 4, Mrs. E. Daniels (Whiteaway). Herbs: 1 and 3, J. Ferguson (Bath); 2, M. Phippen (Bath); 4, M. Phippen (Bath). Herms and Hyphens: 1, R. Larcombe (Bath); 2, R. Snell (Yate); 3 and 4, R. Hyett (Yate). A.O.V. Characis: 1, J. Ferguson (Bath); 2, A. Wilcox; 3, R. Bennett (Yate); 4, S. Green (Yate). Angels: 1 and 2, Mr. and Mrs. K. Press (Bath). Dwarf Cichlids: 1 and 3,

D. Phippen (Bath); 2 and 4, R. Hyett (Yate). A.O.V. Cichlids: 1 and 4, Mrs. B. Pedersen (B.T.F.C.); 2, B. Snell (Yate); 3, D. Phippen (Bath). Corydoras: 1 and 3, P. Greenwood (Bishops Cleeve); 2, M. Bishop (Bishops Cleeve); 4, A. Wilcox. A.O.V. Catfish: 1, 3 and 4, R. Lawrence (B.T.F.C.); 2, M. Toppes (Yate). Danios and Minnows: 1, T. Danford (B. Aero); 2, B. Snell (Yate); 3, J. Ferguson (Bath); 4, C. Webb (Yate). Botias, Loaches and Eels: 1 and 4, R. Poots (Yate); 2, M. Traves (Yate); 3, Mr. and Mrs. K. Press (Bath). Rasboras: 1 and 2, Mrs. B. Pedersen (B.T.F.C.); 3 and 4, R. Hyett (Yate). Killifish: 1, 2, 3 and 4, R. Chapman (B.T.F.C.). Rift Valley Cichlids: 1 and 2, B. Snell (Yate). Mollies: 1, J. Ferguson (Bath); 2, M. Bishop (Bishops Cleeve); 3, B. Walker (Glos. Ag.); 4, R. Poots (Yate). Swordtails: 1, R. Bowd (Bishops Cleeve); 2, P. Scrivens (Bishops Cleeve); 3, Mrs. E. Daniels (Whiteaway); 4, B. Snell (Yate). Platies: 1, R. Lawrence (B.T.F.C.); 2, Mr. and Mrs. K. Press (Bath); 3, J. Ferguson (Bath); 4, P. Greenwood (Bishops Cleeve). Guppies (male): 1 and 2, P. Greenwood (Bishops Cleeve); 3, D. Walsh (Yate); 4, J. Ferguson (Bath). Guppies (female): 1, T. Tovey (Yate); 2, R. Lawrence (B.T.F.C.); 3, Mr. and Mrs. K. Press (Bath); 4, P. Greenwood (Bishops Cleeve). A.O.V. Tropical Fish: 1, P. Greenwood (Bishops Cleeve); 2, R. Lawrence (B.T.F.C.); 3, Mr. and Mrs. K. Press (Bath); 4, B. Sprake (B. Aero). A.V. Seated Pairs: 1, R. Hyett (Yate); 2 and 4, Mrs. B. Pedersen (B.T.F.C.); 3, R. Larcombe (Bath). Breeders Egglayers: 1, T. Tovey (Yate). Breeders Livebearers: 1, F. Scrivens (Bishops Cleeve). A.V. Egglayer (Junior): 1, Anzoy Press (Bath); 2, K. Daniels (Whiteaway); 3, T. Sullivan (Whiteaway). A.V. Livebearer (Junior): 1, K. Daniels (Whiteaway); 2, N. Press (Bath); 3, T. Sullivan (Whiteaway). Furnished Jars: 1, Mrs. Viner (Bishops Cleeve); 2, Mr. and Mrs. K. Press (Bath); 3, R. Poots (Yate). Goldfish (9 in. limit): 1, R. Walker (Glos. Ag.); 2, B. Snell (Yate); 3, Mrs. E. Daniels (Whiteaway); 4, D. Phippen (Bath). Bristol Shubunkins: 1 and 2, R. Pincock (B.A.S.); 3, Mr. and Mrs. K. Press (Bath); 4, Mrs. E. Daniels (Whiteaway). A.V. Fantails: 1 and 2, R. Davis (Bath). A.V. Veiltails: 1 and 2, R. Davis (Bath). A.O.V. Fancy Fish: 1, 2 and 3, F. Russell (Bath). Koi and A.O.V. Pond and River: 1, Mr. and Mrs. K. Press (Bath); 2, R. Lawrence (B.T.F.C.); 3, R. Webb (Bath); 4, B. Walker (Glos. Ag.). Single Tails 1973: 1 and 2, R. Pincock (B.A.S.); 3, C. Summers (B.A.S.). Twin Tails 1973: 1, C. Summers (B.A.S.); 2, R. Davis (Bath). Breeders and Single Tails 1973: 1, C. Summers (B.A.S.). Furnished Aquarium Coldwater: 1, Mr. and Mrs. K. Press (Bath). Champion of Champions: D. Noble (Yate). Best Tropical Fish in Show: J. Ferguson (Bath). Best Coldwater Fish in Show: B. Walker (Glos. Ag.). Most Points in Show: Mr. and Mrs. K. Press.

OFFICERS and Committee elected at the Newbury and District A.S. annual general meeting in October were: chairman, G. N. Swait; vice-chairman, B. Barrett; secretary, G. Taylor; treasurer, R. Brown; show manager, P. Legg; committee, G. Foster (show secretary), P. Bourfield, R. Lloyds, G. Turner, K. Hillier, K. Chapman. The chairman expressed his thanks and that of the club to retiring committee members and to everyone who helped make the club's first open show such a success. At the November meeting a good audience enjoyed a lively and entertaining evening's talk given by R. Mills, on filters and filtration. A table show for Pairs and A.V. was also held and judged by P. Legg, the results being:

holamid A TABLET
A DAY, SENDS
WHITE SPOT AWAY
Hillside Aquatics London N12

Pairs: 1, K. Hillier; 2, I. Dibley; 3, T. Whitehead; 4, R. Canning. A.V.: 1, 2 and 3, R. Canning; 4, T. Whitehead.

DESPITE difficulties arising from the loss of the meeting rooms in the earlier part of the year, membership of the **Merseyside A.S.** has grown steadily throughout the year and new members are being recruited even at this late stage in the season. Much enthusiasm has been shown this year by a dedicated group of "showmen" (and, of course, "showladies," too), who have enjoyed great success at open shows. The Society has staged five table shows during the year and competition for the shield to be awarded to the member gaining the most points over the year has been fiercely contested. The number of entries at each show has been very high and at the final show held in November, over one hundred fish were berthed. The breeding programme, launched early in the year was hampered in its progress by the disruption caused by so much "moving home" but finally got under way when the Society settled back into permanent headquarters once more. Several members have succeeded in qualifying for their first breeder's diploma. The show secretary and his helpers have been rushing around photographing entries for the home furnished aquaria competition. Awards for all these activities were the highlight of the meeting in November and on 11th December a party quiz night was held, and which brought the year's activities to a sociable close. The staging of the annual exhibition at the Liverpool show this year, was memorable for many reasons. Due to a shortage of "caravan," the society was given a much smaller marquee than in recent years and careful plans based on the space normally available had to be hastily revised by the show committee. Those who worked so hard to have everything ready in time, were therefore very gratified when the result of all their efforts was rewarded by a gold medal award from the Liverpool Corporation. Throughout the year the Society has enjoyed many interesting meetings. A friend from Canada, Graham Wood, who has been living in England for a time, has given some interesting lectures in his own inimitable style. The vice-chairman has, with his witty commentary, made some of the other slide lectures doubly enjoyable. The show secretary prepared a very entertaining quiz show. Ian Wood, secretary of the Federation of Northern Aquarium Societies, delivered an excellent lecture. Gordon Himes held the society enthralled with a talk on his visit to the Far East with his colleague Keith Barraclough and more recently, there has been an unusual talk on water chemistry from Dr. Lewis—a chemist, who, at a practising aquarist understood the need to explain how best to create the water conditions needed for good fishkeeping. Particulars of society membership and meetings, may be obtained from the hon. secretary, B. Wilson, 3 Thorpe, Skelmersdale, Lancs.

IN November **Workshop Aquarist** and **Zoological Society** held their annual table show and the results were as follows: Best Fish in Show: F. G. Gibson. Guppies: 1 and 3, F. G. Gibson; 2, A. Mawson. A.O.V. Livebearers: 1, F. G. Gibson; 2 and 3, J. B. Clarke. Egg-laying Toothcarps: 1, Mr. and Mrs. E. Simpson. Barbs: 1, A. Mawson; 2, Mr. and Mrs. E. Simpson; 3, Mr. and Mrs. Perkins. Rasboras and Danios: 1, G. Clarke; 2, J. B. Clarke; 3, F. G. Gibson. Fighters: 1, T. Reed; 2, A. Mawson. Anabantids: 1, Mr. and Mrs. E. Simpson; 2, G. Clarke; 3, Mrs. M. Clarke. Characins: 1, Mr. and Mrs. Perkins; 2, J. B. Clarke; 3, F. G. Gibson. Cichlids: 1, T. Reed;

2, G. Clarke; 3, Mrs. P. Borsall. Catfish and Loach: 1 and 2, Mr. and Mrs. E. Simpson; 3, Mrs. P. Taylor. A.O.V. Tropical: 1 and 3, J. G. Gibson; 2, Mr. and Mrs. E. Simpson. Pairs (Livebearers): 1 and 2, J. B. Clarke; 3, G. Clarke. Pairs (Egg-layers): 1, T. Reed; 2, Mr. and Mrs. Perkins; 3, B. Fisher. Breeders (Livebearers): 1, Mr. and Mrs. Perkins; 2, Mr. and Mrs. E. Simpson. Breeders (Egg-layers): 1, T. Reed; 2, Mrs. J. Gibson. Juniors A.V. Tropical: 1, Miss Debora; 2, Miss Donna; 3, Master Dale. A.O.V. Coldwater: 1, Master Dale. Mini-jar: 1, B. Fisher. Plants: 1 and 3, F. G. Gibson; 2, A. Mawson. Best Pair: J. B. Clarke. Best Novice: E. Simpson. Home Aquaria: 1, A. Mawson; 2, T. Handley; 3, M. Hopewell. Challenge Trophy: 1, A. Mawson; 2, B. Perkins; 3, J. B. Clarke. Most Points gained in open shows: 1, T. Reed; 2, Mr. and Mrs. E. Simpson; 3, B. Perkins.

RESULTS of the **Walthamstow and District A.S.** show were as follows: Class Aa/b: 1, Leytonstone and Stratford; 2 and 3, Dunmow; 4, United Independent. Class Ak: 1, Mrs. B. Cowell (United Independent); 2, Mrs. J. Salisbury (United Independent); 3, L. Baker (E.L.A.P.A.); 4, G. Tollyday (Chingford). Class B: 1, Master A. Cowell (United Independent); 2, S. Mason (Rochampton); 3, P. Moye (Sudbury); 4, B. Hamilton (Walthamstow). Class C: 1, Mr. and Mrs. Ward (Banbury); 2, P. Coyle (United Independent); 3, D. Wood (Haverhill); 4, D. Lambourne (Rochampton). Class Ca: 1, R. Bowes (United Independent); 2, D. Ingle (Chingford); 3, I. Strange (Basingstoke); 4, D. Pritchard (Tonbridge) and J. Boss (E.L.A.P.A.). Class D: 1, A. Hall (High Wycombe); 2, Mrs. Netherell (Riverside); 3, J. Connolly (Bethnal Green); 4, B. Peacock. Class Db: 1, S. Cowell (United Independent); 2, C. Hart (Harlow); 3 and 4, P. Jarvis (Sth. London). Class E: 1, J. Twine (Walthamstow); 2, C. Kildingbury (Uxbridge); 3, G. Elton (Sth. London); 4, Miss D. Cowell (United Independent). Class Es: 1, R. Bowes (United Independent); 2, B. and L. Turner (Basingstoke); 3, E. McQuade (Rochampton); 4, S. Cowell (United Independent). Class F: 1, 2 and 3, C. and K. Thomas (Walthamstow); 4, I. Hatley (Harlow). Class G: 1, Mrs. P. Lambourne (Rochampton); 2, Mrs. Netherell (Riverside); 3, K. Baker (Tonbridge); 4, P. Farnell (Tonbridge). Class H: 1, P. Moye (Sudbury); 2, R. Bowes (United Independent); 3, J. Connolly (Bethnal Green); 4, T. Cruickshank (Ealing). Class J: 1, J. Salisbury (United Independent); 2, S. Mason (Rochampton); 3, S. Cowell (United Independent); 4, A. Hall (High Wycombe). Class K: 1 and 2, Mrs. P. Jarvis (Sth. London); 3, J. Connolly (Bethnal Green); 4, T. Cruickshank (Ealing). Class L: 1, Mr. and Mrs. Martin (Nth. Kent); 2, Master T. Coyle (United Independent); 3, D. Cope (Tottenham); 4, T. Cruickshank (Ealing). Class M: 1, S. Hedges (Bethnal Green); 2, R. Bowes (United Independent); 3, Mrs. R. Coyle (United Independent); 4, S. Adams (Bethnal Green). Class N: 1, R. Onslow (Basingstoke); 2, Mrs. S. Wood (Haverhill); 3, M. Stollery (Rochampton); 4, Mrs. P. Jarvis (Sth. London). Class O: 1 and 3, R. Chapman (Tonbridge); 2, Mrs. J. Arrow (E.L.A.P.A.); 4, W. Woodward (Nth. Kent). Class P: 1, Mr. Amos (Tonbridge); 2, P. Moye (Sudbury); 3, C. Kildingbury (Uxbridge); 4, A. Hall (High Wycombe). Class Q: 1, C. Kildingbury (Uxbridge); 2, J. Connolly (Bethnal Green); 3, Mr. Pimm (Chingford); 4, A. Noronha (Orpington). Class R: 1, G. Smith (Walthamstow); 2, Mrs. Cruickshank (Ealing); 3, S. Mason (Rochampton); 4, Mrs. Netherell (Riverside). Class S: 1 and 2, Mrs. Netherell (Riverside); 3, T. Smith (Tottenham); 4, D. Cope (Tottenham). Class T: 1, Mr. Woodley (Hampstead); 2 and 3, B. Pritchard (Tonbridge); 4, A. Chandler (Walthamstow). Class U: 1, 2 and 3, S. Hedges (Bethnal Green); 4, G. Hall (Walthamstow). Class V: 1, R. Rich (Basingstoke); 2 and 3, A. Lawman (G.S.G.B.); 4, G. Fleming (A.G.B.). Class W: 1 and 4, S. Hedges (Bethnal Green); 2, C. Bellingham (Tonbridge); 3, T. Howler (Walthamstow). Class Xb: 1 and 2, S. Hedges (Bethnal Green); 3, J. Salisbury (United Independent); 4, B.

Fry (Nth. Kent). Class Xb-m: 1, M. Stollery (Rochampton); 2, Mr. Pearson (E.L.A.P.A.); 3, A. Field (E.L.A.P.A.); 4, C. and K. Thomas (Walthamstow). Class Xc-1: 1, A. Chandler (Walthamstow); 2, B. Baulson (Walthamstow); 3, M. Strange (Basingstoke); 4, E. Holmes (Banbury). Class Xc-w: 1, I. Fleming (A.G.B.); 2, D. Goodbody (Walthamstow); 3, A. Lawman (G.S.G.B.); 4, I. Fleming (A.G.B.). Class Z: 1, Mrs. Netherell (Riverside); 2 and 4, A. Chandler (Walthamstow); 3, W. Woodward (Nth. Kent). Best Fish in Show was awarded to R. Bowes (United Independent). Highest Pointed Society was United Independent A.S.

THE **Birmingham Section of the Fancy Guppy Association** meet on the fourth Sunday afternoon of each month at The Glebe Farm Community Centre, Stechford, Birmingham. All enquiries should be addressed to the show secretary, Graham Beesham, 35 Frankton Close, Matchborough, Redditch. Tel: Ryknild 4697. Members left the November meeting feeling despondent, following a discussion on the petrol situation. It was felt by most members that in the event of rationing they were so widely spread throughout the country that it would be impossible for them to attend future F.G.A. meetings. The Section would like to congratulate Jim Matthews on winning his first Silver Card and R. Jones upon gaining his fifth which qualified him for the silver pin guppy. A. C. & J. Truman of Bristol were awarded Best Breeders, Best in Show.

THE **G.K.N.P.A.S.** recently formed the following committee at the annual general meeting after a very successful year. President: T. Lowe; Chairman: G. Coney; Vice-Chairman: D. Horton; Hon. Secretary: A. Horne; Treasurer: M. Nichols; Show Secretary: K. Hall, 36 Richard Street, Darlington. Asst. Show Secretary: D. Penwright; Publicity Officer: G. Coney; News Letter Editor: A. Hall. Committee Members: Mrs. L. Whitington, B. Horne, Mrs. Lowe, J. Taylor, T. Saunders, D. Rickham.

FIVE societies took part at the **Gainsborough A.S. Inter-Society Competition** and there were nearly one hundred entries. Results: Anabantids: 1, E. Simpson (Workop); 2, T. Reid (Workop); 3, K. Shaw (Gainsborough). Livebearers: 1, 2 and 3, Mr. and Mrs. P. G. Sibson (Workop). Cichlids: 1, Mr. and Mrs. M. Hatfield; 2, Mr. and Mrs. K. Blades; 3, Mr. and Mrs. R. Harris. Cats, Loaches, Sharks, Foxes: 1, K. Cowan; 2, S. Withers; 3, Mr. and Mrs. D. Gilding. Danios, Mims, Rasboras: 1 and 3, Mr. and Mrs. D. Gilding; 2, Mr. and Mrs. R. Blades. A.O.V.: 1, Mr. and Mrs. D. Gilding; 2, Mr. and Mrs. P. G. Sibson; 3, Mr. and Mrs. R. Blades. Barbs: 1 and 3, Mr. and Mrs. K. Blades; 2, Mr. and Mrs. D. Gilding. Characins: 1 and 3, Mr. and Mrs. W. Perkins (Workop); 2, Mr. and Mrs. D. Gilding.

THE **Yate D.A.S.** November meeting was held at this year's annual general meeting, and the 1972/73 officers were thanked for their year's service to the club.

This year's officers elected were as follows: Chairman: J. Powell; Vice-Chairman: C. Snickland; Treasurer: M. Ridge; Editor: B. Snell; Show Manager, P.R.O.: R. A. Bennett; Auditors: E. Beer and T. Green; Joint Secretaries: Mr. and Mrs. B. Heywood. Meetings are held the first Monday of each month at the "Half Moon" Coalpit Heath. Visitors and new members welcome.

OWING to the chairman being absent for business reasons, the chair at the **New Forest A.S.** November meeting was taken by Mr. E. W. Leavy. The main item on the business side was the discussion resulting from criticism of the Society regarding the three club Inter-Club Competition, which has been running for eight years. After various comments had been made a proposal was put forward that the Society discontinued being a member of this competition. This was put to a vote and carried. The chairman stated that the

DISINFECT NEW PLANTS AND FISH WITH  **Hillside Aquatics London N12**

committee would still arrange table shows with the clubs concerned but not on a league basis.

After the break an interesting show of coloured slides was given by G. Derby, a former club member, on setting up a furnished aquaria and servicing a furnished aquaria. This brought forth many comments and a second showing was given with members commenting on each slide. The table show was well supported with the show bench full of fish. Results were as follows: Barbs: 1, 2, and 3, M. Aust; 4, D. Harding. Platy: 1 and 4, D. Harding; 2, Mr. Higginson; 3, Mr. Roe.

AQUASCAPES were the subject at the November meeting of the Weymouth A.S., which again was very well attended. The Secretary, Mr. A. Worth gave an interesting demonstration and explained to members the principles involved in Aquascapes. He used fossilised wood and a variety of cacti in his demonstration and then Master Paul Taylor showed the Society that even junior members can aquascape a tank.

Several different types of jars were used in the novelty aquaria competition and the result was: 1, Mrs. J. Mansel; 2, H. Cleall; 3, Mrs. Julie Brooks; 4, R. Hart. The judge was Mr. A. Billington. The Table Show for Livebearers attracted a high entry of 40 fish. Results as follow: Guppies: 1 and 4, M. Cleall; 2, A. Billington; 3, D. Mullen. Swordtails: 1, D. Mullen; 2, G. Fitzgerald; 3 and 4, Mrs. V. Worth. Platys: 1 and 2, D. Mullen; 3, A. Carter; 4, R. Hart. Molliés: 1, J. Brooks; 2, Mrs. V. Worth; 3, J. Hodder; 4, G. Fitzgerald. A.O.V. Livebearers: 1, M. Cleall; 2, D. Mullen.

New members and visitors are welcome at the meetings which are held on the second Tuesday of the month at 7.30 p.m. at the Ratcliff Hall, Queen's Road, Radpole Spa, Weymouth.

AT the November meeting of Wednesbury and District A.S., Mr. R. Dawes, the Assistant Show Secretary explained, to a good turnout of members, the show rules of the society. There were quite a few new members who found it extremely helpful to their new found hobby.

Results of the evening's table show: Cichlids, Class A: 1 and 3, J. Reeves; 2, R. Farmer. Cichlids, Class B: 1, R. Law; 2, K. Smith; 3, P. Raugh. Rasboras: 1, 2 and 3, J. Reeves. Novice A.V.: 1, Mrs. J. Johnson; 2, M. Johnson; 3, Mrs. J. Smith. Best fish in show was shown by Mrs. J. Johnson.

Meetings are held at the Midland Vaults, Upper High Street, Wednesbury the first Monday of every month and all will be made very welcome.

ANNUAL SHOW results of the Hartlepool A.S. were as follow: Best fish in show went to B. Cooper (Peterlee). Best Society: Doncaster. Best exhibition: Mr. and Mrs. Wells (Doncaster). Breeders Pr. (Egglayers): 1 and 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. Reed (Workop). Breeders Pr. (Livebearers): 1, Mr. Blundell (Doncaster); 2, J. Ravel (Hartlepool); 3, Mr. Lawson (N.G.L.A.S.). Breeders (Egglayers) (6 Fish): 1, Mr. Reed (Workop); 2, Mr. and Mrs. Wells (Doncaster); 3, F. Sonley (B.K.A.). Breeders (Livebearers) (6 Fish): 1 and 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, Mr. Thickbroom (Castleford). A.V. Guppy: 1 and 2, Mr. Wright (South Shields); 3, Mr. Myers (Ind.). A.V. Platy: 1, J. Furness (Castleford); 2, Mr. and Mrs. Perkins (Workop); 3, Mr. Blundell (Doncaster). A.V. Molliés: 1, J. Furness (Castleford); 2, G. Brown (M.P.A.S.); 3, K. Greenley (Half Moon). A.V. Swordtail: 1, Connelly and Robinson (Half Moon); 2, Mr. Jackson (Redcar); 3, Mr. Wright (Hillingham). Cichlids (small): 1, Mr. Thickbroom (Castleford); 2, Mr. Davidson (M.P.A.S.); 3, Mr. Mohammad (M.P.A.S.). Cichlids (large): 1, B. Cooper (Peterlee); 2, D. Newworthy (Peterlee); 3, Mr. Peacock (Stockton). Rift Valley Cichlids: 1, C. Enwright (South Shields); 2, J. Race

(Hartlepool); 3, H. Hubbard (Peterlee). Angels: 1, C. Enwright (South Shields); 2, Mr. Gallon (N.G.L.A.S.); 3, J. Ravel (Hartlepool). Fighters: 1, Mr. Reed (Workop); 2, Mr. Myers (Ind.); 3, Mr. Rhodes (Scunthorpe). E.L.T.C.: 1, F. Sonley (B.K.A.); 2, Mr. Mohammad (M.P.A.S.); 3, Mr. and Mrs. Kilvington (Doncaster). Labyrinths: 1, Mr. Blundell (Doncaster); 2, Mr. Barker (Cleveland); 3, R. Thompson (Bishop Auckland). Catfish and Loach: 1, Mr. Davidson (M.P.A.S.); 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. Bellhouse (Zenith). Corydoras and Brochis: 1, Mr. and Mrs. Liddle (Ashington); 2, R. Thompson (Bishop Auckland); 3, Mr. and Mrs. Wells (Doncaster). Rasboras, Danio and Minnow: 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, W. Hall (Washington); 3, Mr. and Mrs. Fletcher (Doncaster). Characins (small): 1, J. Darner (Redcar); 2, Mr. Gallon (N.G.L.A.S.); 3, J. Furness (Castleford). Characins (large): 1, Mr. Davidson (M.P.A.S.); 2, Mr. and Mrs. Daines (Doncaster); 3, Mr. and Mrs. Goodchild (Zenith). Barbs (small): 1, Mr. and Mrs. King (Doncaster); 2, Mr. J. Furness (Castleford); 3, Mr. Rhodes (Scunthorpe). Barbs (large): 1, Mr. and Mrs. Hunt (Ashington); 2, Mr. Barker (Cleveland); 3, H. Pearce (Northalerton). Sharks, Labret and Flying Fox: 1, Mr. Thickbroom (Castleford); 2, Mr. Blundell (Doncaster); 3, Mr. K. Greenley (Half Moon). A.O.V.: 1, A. Barrett (Castleford); 2, Mr. and Mrs. Liddle (Ashington); 3, D. Newworthy (Peterlee). A.V. Mazine: 1 and 3, J. Ryan (Hartlepool); 2, B. Steele (Hartlepool). A.V. Goldwater: 1, 2 and 3: Mr. Edwards (Half Moon). Junior: 1, C. Bask (Stockton); 2, J. Wadsworth (Half Moon); 3, D. Perkins (Workop).

The show proved a great success with a total of 638 entries.

AT the first annual general meeting of the Redcar A.S., the following members were elected as officials: Chairman: Mrs. C. Standley; Secretary and Treasurer: I. Thompson; Committee: E. Stanley, Mrs. C. Bartle, I. Martin, E. Eastwood, D. Nagle.

A TABLE SHOW was held by Llantwit Major A.S. at their November meeting, the points from which went towards the "Mildred Thomas Cup", awarded annually to the member with most points. Class K, Danios and W.C.M.M. Results: 1 and 2, G. Lewis; 3, Master John Edwards; 4, J. J. Edwards. While judging was in progress members were entertained with a Slide Show describing "The Tale of a Fish". Also in November the Society visited Swansea A.S. for an Inter-Club contest which Llantwit narrowly won by 11 points to 9. All members thoroughly enjoyed their visit and thank Swansea for their hospitality and look forward to a return in 1974.

OFFICERS elected at the Bracknell A.S. annual general meeting were as follow: President and Vice-President: Ken and Joyce Roberts; Chairman: L. Jordan; Vice-Chairman: D. Arkell; Treasurer: K. Phillips; Secretary: A. Crockett; 15 The Larches, Warfield Park, Bracknell. Phone: Winkfield Row 4596. Show Secretary: J. Nicholls; Programme arranger: Mary Morgan.

J. Horsy was presented with a cup for Aquarist of the Year, also a cup for the highest points for a novice in the table shows. L. Little received two cups for the highest points in Specialist class and Senior class.

The second meeting of the month was a talk and slide show on collecting and exporting of fish given by R. Raynutt. The table show results were: Specialist U.V.W.: 1, Natalie Jordan; 2, L. Jordan; 3, R. Norris. Senior A.O.V.: 1, 2 and 3, L. Little.

RESULTS of the Redcar A.S. Open Show were as follow: Class Ba: 1 and 4, Mr. and Mrs. Barker & Son; 2, R. Atherton; 3, M. Kennedy. Class Bc: 1, D. Nagle; 2, R. Atherton; 3, Mr. Rodway; 4, J. King. Class Ca: 1, Mr. and Mrs. Dörner; 2, Connelly and Robinson; 3, K. Bessant; 4, Mr. and Mrs. Shearer. Class Cc: 1, Mr. and Mrs. Welford; 2,

Mr. Sonnelly; 3, Mr. and Mrs. Goodchild; 4, Mrs. Asquith. Class Dc: 1, Mr. Wright; 2, Miss P. Newitt; 3, Mr. S. Welford; 4, Mr. and Mrs. Barker & Son. Class Dd: 1 and 3, K. Atherton; 2, Mr. Wainwright; 4, C. Bealight. Class Ea: 1, Mr. McClenaghan; 2, J. Beavers; 3, J. King; 4, Mr. Dörner. Class Eb: 1, Mr. and Mrs. Barker & Son; 2 and 3, J. Beavers; 4, R. Thompson. Class F: 1 and 4, Mr. McClenaghan; 2, Mr. Sonnelly; 3, Mr. Vickerstaff. Class G: 1, Mr. and Mrs. Saunders; 2, Mr. Garthwaite; 3, J. Beavers; 4, Mr. Wadsworth. Class H: 1, K. Greenley; 2, Mr. and Mrs. Saunders; 3, Mr. and Mrs. Squirrel; 4, Mr. Dörner. Class J: 1 and 4, I. Thompson; 2, K. Bessant; 3, Mr. M. Sreedon and Son. Class K: 1, Mr. and Mrs. Sreedon; 2, Mr. and Mrs. Richardson; 3, Mr. McClenaghan; 4, Mr. M. Sreedon and Son. Class L: 1, Mr. Bellhouse; 2, Mr. McClenaghan; 3, Mr. and Mrs. Lamb; 4, Mrs. Asquith. Class Ma: 1, K. Greenley; 2, S. Welford; 3, Mr. and Mrs. Lamb; 4, Mr. Fall. Class M.Z.A.O.S.: 1, Mr. and Mrs. Squirrel; 2, Mr. Hatton; 3, Mr. Turner; 4, Mr. G. McGuire. Class N.B.M.: 1, Mr. Osman; 2, Mr. Sonnelly; 3, Mr. Wright; 4, P. Newton. Class N.O.T.: 1, Mr. and Mrs. Goodchild; 2, Connelly and Robinson; 3, Mr. Brown; 4, Mr. Sedgewick. Class O: 1, M. Kennedy; 2, Mr. Wright; 3, Mr. and Mrs. Lamb; 4, Mr. Martin. Class P: 1, M. Learman; 2, Mr. Brown; 3, Mr. and Mrs. Dörner; 4, Mr. Wrightson. Class Q: 1, Mr. Jackson; 2, Mrs. Nesbitt; 3, Mr. M. Sreedon and Son; 4, Mr. and Mrs. Welford. Class R: 1, Mr. and Mrs. Kennedy; 2 and 4, Mr. and Mrs. Saunders; 3, Mr. Steele. Class S: 1, Mr. Greenley; 2, Mr. M. Sreedon and Son; 3, D. Nagle; 4, R. Thompson. Class T: 1, Mr. Rodway; 2, R. Thompson; 3, Mr. and Mrs. Goodchild; 4, Mrs. Asquith. Class X.B.M.: 1, Mr. and Mrs. Walker; 2 and 4, Mr. Sonnelly; 3, Mr. Atherton. Class X.O.P.: 1, Mr. Wrightson; 2 and 3, Mr. Learman. Class X.Q.T.: 1, Connelly and Robinson; 2, Mr. Turner; 3, Mr. Richardson; 4, Mr. and Mrs. Saunders. Class A.O.V.: 1, 2 and 4, R. Edwards; 3, Mr. and Mrs. Goodchild. Champion Fish of Show: K. Greenley. Best Society: 1, Redcar A.S.; 2, Half Moon A.S.; 3, Hartlepool A.S.

NEW committee officers elected at the annual general meeting of the Stroud and District A.S. were as follow: Chairman: C. Whittaker, 1 Spring Bank, Middle Spring, Ruscombe, Stroud. Phone: Stroud 5817. Secretary: Mrs. D. Cole, "Avignon", The Mill, Handrick, Stroud. Phone: Stroud 4504.

AT the Brighton and Southern A.S. monthly meeting in November, Mr. Rice the chairman, welcomed the lecturer and judge, both of whom came from Tonbridge A.S. Mr. John Bellingham lectured on Barbs and how to care for these fish, while Mr. R. Baker judged the fish in the Table Show. The classes were Db and Dc (combined). The Ladies' Trophy and Breeders' Egglayers and Livebearers.

THE Fancy Guppy Association once again had a stand at the B.A.F. which was put on by the Manchester Section. It attracted as much, if not more interest than last year, and it also won some of the awards.

The section won the first three places in the single guppy class, first and third in the Pairs Livebearers, and a second in the Society furnished aquarium. Anybody wishing to join this keen guppy section is invited to any meeting at the Longlight Hotel, rear entrance to Belle Vue, on the first Sunday of the month at 2.30 p.m.

BE PREPARED
 always keep a packet by you
Hillside Aquatics London N12

A VERY interesting slide show about the Fin and Gill Club of the Indiana State Prison was shown to members of the **Newcastle Guppy and Livebearer Society** by Mr. D. Renton at the November meeting. The results of the table show was as follows: A.V. Male Guppy 1, 2 and 3, R. Lawson. Three Matched Male Guppies: 1 and 2, J. Gallon; 3, Mr. and Mrs. Cawton. Male Guppy (Novice): 1, R. Kerr.

Results of the Open Show were: Male Guppy: 1, P. Wright; 2, R. Lawson; 3, J. Laidler. Three Matched Male Guppies: 1, D. Pomeroy; 2, J. Gallon; 3, Mr. and Mrs. Cawton. Breeders' Class Guppy: 1, J. Laidler; 2, G. Fenwick. Female Molly: 1, Mr. Davison; 2, Mr. Patterson; 3, Mr. and Mrs. Coates. Female Swordtails: 1, Mr. and Mrs. Coates; 2, R. and T. Milson; 3, Mr. Duncanson. Female Platy: 1, Mr. and Mrs. Bell; 2, Mr. Duncanson; 3, Mr. Alexander. Breeders' Class Livebearer: 1, Mr. and Mrs. Cawton; 2, Mr. Neworthy; 3, Mr. Grey. Female Guppy: 1, D. Pomeroy; 2, Mr. Duncanson; 3, Mr. Mohammed. Breeding Pairs Guppy: 1, Mr. Ryan; 2, J. Laidler; 3, Mr. Pomeroy. Male Molly: 1, Mr. Fortune; 2, R. Lawson; 3, G. Brown. Male Swordtails: 1, Mr. and Mrs. Coates; 2 and 3, Mr. and Mrs. Sowerby. Male Platy: 1, Mr. Steel; 2, Mr. Robertson Jr.; 3, R. Shanks. Breeding pairs (Livebearer): 1, R. Lawson; 2, Mr. Baglass; 3, R. and T. Milson. A.O.V. Livebearer: 1, Mr. and Mrs. Coates; 2, Mr. and Mrs. Renton; 3, J. Laidler. Large Barbs: 1, Mr. Southall; 2, Mr. Duncanson; 3, I. H. Darokin. Large Cichlids: 1 and 2, Mr. Neworthy; 3, Mr. Shanks. Large Characins: 1, Mr. Lisle; 2, Mr. Duncanson; 3, Mr. Burn. A.V. Fighter: 1, P. Myers; 2, Mr. Robertson Jr.; 3, Mr. T. Hope and Son. Rasbora and Danio: 1, D. Pomeroy; 2, Mr. Neworthy; 3, Mr. Surtees. Sharks and Flying Fox: 1, Mr. and Mrs. Renton; 2, Mr. Edwards; 3, Mr. Brown. Breeding pairs (Egglayers): 1, B. Lowe; 2, Mr. Neworthy; 3, R. Shanks. Furnished Jars: 1, Mr. Robertson Sr.; 2, E. Smith; 3, Mr. and Mrs. Renton. Small Barbs: 1, Mr. and Mrs. Ribbidge; 2, Mr. Hope; 3, Mr. Robertson Sr. Small Cichlids: 1 and 3, G. Brown; 2, Mr. Neworthy. Small Characins: 1, J. Laidler; 2, Mr. Holman; 3, Mr. and Mrs. Sowerby. A.O.V. Labyrinth: 1, Mr. Grey; 2, Mr. and Mrs. Barras; 3, R. Peardon. Egglaying Toothcarp: 1, Mr. Mohammed; 2, R. Kerr; 3, Mr. Middlemas. Catfish and Loach: 1, Mr. Holman; 2, Mr. Brown; 3, Mr. and Mrs. Ribbidge. Breeders' Class Egglayer: 1, Mr. and Mrs. Coates; 2, Mr. and Mrs. Moorhead; 3, G. Martin. A.V. Goldwaster: 1 and 3, B. Edwards; 2, Mr. Duncanson. A.O.V. Potpourri: 1, Mr. Neworthy; 2, Mr. and Mrs. Coates; 3, Mr. Southall.

THE November meeting of the **British Marine Aquarist Association West-Midland Group**, was one of the best held for some time. Six new members joined on this night and they were: P. Shingleton, W. Proden, Mr. and Mrs. G. Dale, S. Pearce and A. Poll. A very fine slide show on the Natural Tank was given by Brian Fleetwood and this was so good that most members are now going to have a shot at this Natural tank. It was agreed to have a dinner and dance in January, 1974, for West Midland members.

MEMBERS of the **Hastings and St. Leonards A.S.** recently heard Mr. Barry Funnell speak on Livebearers. He illustrated his lecture with a Slide Show starting with the common Guppy and went on to Swordtails, Platies and Mollies. He ended with the less common fishes like Half Beaks, Mosquitos and Merry-widows.

The table show was an inter-club event with the Tonbridge A.S., the latter winning by 1,330 pts. to 1,030 pts. Results were: Egglayers (breeders): 1, P. Stapley (H); 2, T. Adams (H); 3, J. Grief (H). Barbs: 1, T. Adams (H); 2 and 3, J. Billingham (T). Corydoras: 1, Mrs. D. Pochard (T); 2, Mrs. Matheson (T); 3, Mrs. Adams (H).

A.O.V. Livebearers: 1 and 2, Mrs. B. Puchard (T); 3, Miss H. French (H). A.O.V. Tropicada: 1, D. Puchard (T); 2, K. Stonell (T); 3, I. Matheson (T). Loaches: 1, Mrs. I. Billingham (T); 2, T. Adams (H); 3, D. Puchard (T).

AT the second meeting of the month of **Hastings and St. Leonards A.S.**, Mr. D. Soper lectured on "Diseases of Fishes". He spoke of Whitespot as being the most common and easiest of all diseases to cure, and finished with those more rare.

Mr. P. Stapley was elected as the Show Manager for the 1974 Open Show. The table show was for Mollies, the result being: 1, Mrs. Power; 2 and 3, P. Stapley.

AT the annual general meeting of the **British Aquarist Study Society**, the following officers were elected: Chairman: P. Bied; Vice-Chairman: Dr. G. Cist; Secretary: D. Cook; Research Committee: Chairman, R. Forster; Members: E. Venon, H. J. Aylott and M. Thomas.

The afternoon session began with the announcement of Mr. J. Williams of Leicester as the new President. The talk on the fishes of the Crater Lakes of the West Cameroons, was given by Dr. Illichewyn Trewavas. This eminent speaker—a world acknowledged authority on African fishes—illustrated her excellent talk by slides of her own field research conducted in the region three years ago. The lecture was followed by a panel of experts; Dr. Trewavas, Dr. Greenwood, Dr. Gwynne Vevers and H. J. Aylott, answering questions on a variety of subjects put by members of the audience of over eighty people.

The next meeting of the Society will be held at London Zoo on 16th March, 1974. This will take the form of a Symposium on Labyrinth Fishes and the main speaker will be Professor McNeill Alexander.

SECRETARY CHANGES

Erith and District A.S.: K. A. Beadle, 135A Broadway, Bexleyheath, Kent.

Yate and District A.S.: Mr. and Mrs. Ita Heywood, 24 Durrhurst, Yate, Bristol BS1 7J. Tel.: Chipping Sodbury 343512.

Wednesbury and District A.S.: R. Law, 24 Ross Heights, Rowley Regis, Warley, Wores. B65 9OW.

Chingford and District A.S.: G. B. Tolladay, 61 Kenneth Road, Chadwell Heath, Romford, Essex.

Stroud and District A.S.: Mrs. D. Cole, "Avignon," The Hill, Randwick, Stroud. Phone: Stroud 4504.

British Cichlid Association: Mr. F. Berry, 131, Sherbrook Road, Caybrook, Notts.

SHOW SECRETARY

Erith and District A.S.: M. Thomas, 4 Mayplace Close, Bexleyheath, Kent.

AQUARIST CALENDAR

17th February: Rotherham and District A.S. Fifth Open Show at Brinsworth Mance School, Brinsworth Lane, Brinsworth. Details and schedules from M. J. Wordsworth, hon. secretary, 156 Clay Pit Lane, Rawmarsh, Nr. Rotherham.

9th March: Catfish Association (G.B.) are holding their Open Show which consists of eighteen classes of Catfish (G. and H.). Venue to be announced later. Show secretary, Mr. D. Lambourne, 7 Wheeler Court, Plough Road, London, SW11 2AX. Tel: 01-223 2630.

10th March: Gainsborough A.S. Second Open Show, Town Hall, Gainsborough. Schedules from Show Secretary, W. D. Gidding, 28 Retford Road, Woodbeck, Nr. Retford, Notts.

7th April: Nelson A.S. Open Show at "Civic Centre," Stanley Street, Nelson. Information may be had from H. Illingsworth, 94 Barrowfield Road, Colne, Lancs.

18th April (Easter Monday): Southampton A.S. Open Show at the Avenue Hall, Southampton. Show secretary, P. Brown, 215 Spring Road, Sholing, Southampton.

28th April: Coventry Pool and Aquarium Society, Open Show. Further details (s.a.c. please) from show secretary, S. Woodbridge, 32 Ridgeway Avenue, Coventry, CV3 5BP.

28th April: Blakesborough A.S. Third Open Show in Canteen of J. Blakesborough & Sons, River Street, Birds Royde Lane, Brighouse. Show secretary, T. Barker, 41-43 Camm Street, Brighouse, Yorks.

5th May: Oram A.S. Open Show, at the Recreation Hall, Refuge Street, Shaw, Near Oldham, Lancs.

11th May: Southend, Leigh and District A.S. Open Show, to be held at St. Clements Hall, Leigh-on-Sea. Club furnished, individual furnished, aquascapes and marine classes included. Show schedule from Derek Durrant, 172 Trinity Road, Southend-on-Sea, Essex. Tel: Southend 610576.

12th May: Gloucester A.S. third Open Show will be held at The Education and Leisure Centre, Patricock Road, Gloucester. Schedules Feb. onwards from B. Walker, 41 Hales Road, Gloucester.

19th May: Yovvil and District A.S. Venue to be decided.

26th May: Corby and District A.S. Open Show at the Corby Civic Centre, F.B.A.S. rules. More details later.

8th June: G.K.N.P.A.S. Open Show, G.K.N. Restaurant, Salisbury Street, Darlington, Staffs. Further details from K. Hall, 38 Richard Street, Darlington, Staffs.

9th June: Brighton and Southern A.S. Open Show and Exhibition at St. Barnabas Church Halls, Sackville Road, Hove, where there will be plenty of trade stands.

15th June: Swillington A.S. Open Show at John Smeaton School, Barwick Road, Seacroft, Leeds. Details from C. Townsend, 16 Firtree Gardens, Moorown, Leeds 17.

16th June: Salisbury and District A.S. 10th Annual Open Show will be held at The City Hall, Fisherton Street, Salisbury. Further information later.

16th June: Bishops Cleeve A.S. Open Show. Further details available later.

23rd June: Alfreton and District A.S. Annual Open Show at the Adult Education Centre, Alfreton Hall, Alfreton. Details from the Show Secretary, B. Hickling, "Parkview," 13 Coppice Drive, Eastwood, Notts., phone: Langley Mill 5104.

19th July: Sandgrounders' A.S. Open Show, Meol's Cop Secondary School, Southport.

18th August: Stroud and District A.S. will be holding their Open Show at Stroud Subscription Rooms, as last year. Further details to be announced later.

22nd September: Turbay A.S. proposes to hold its sixth Annual Open Show at the Torquay Town Hall; details of show schedules, etc., later.

6th October: Hinkley and District A.S. Open Show at Heathfield High School, Belle Vue Road, Earl-Shilton. More information from Secretary, K. Bates, 6 Merevale Close, Hinkley, Leics. LE10 0PZ.



SPECIAL OFFER!

FREE FISH BADGES

WITH KING BRITISH VIT-A-MIN

everyday tropical fish food

See page v for full details.