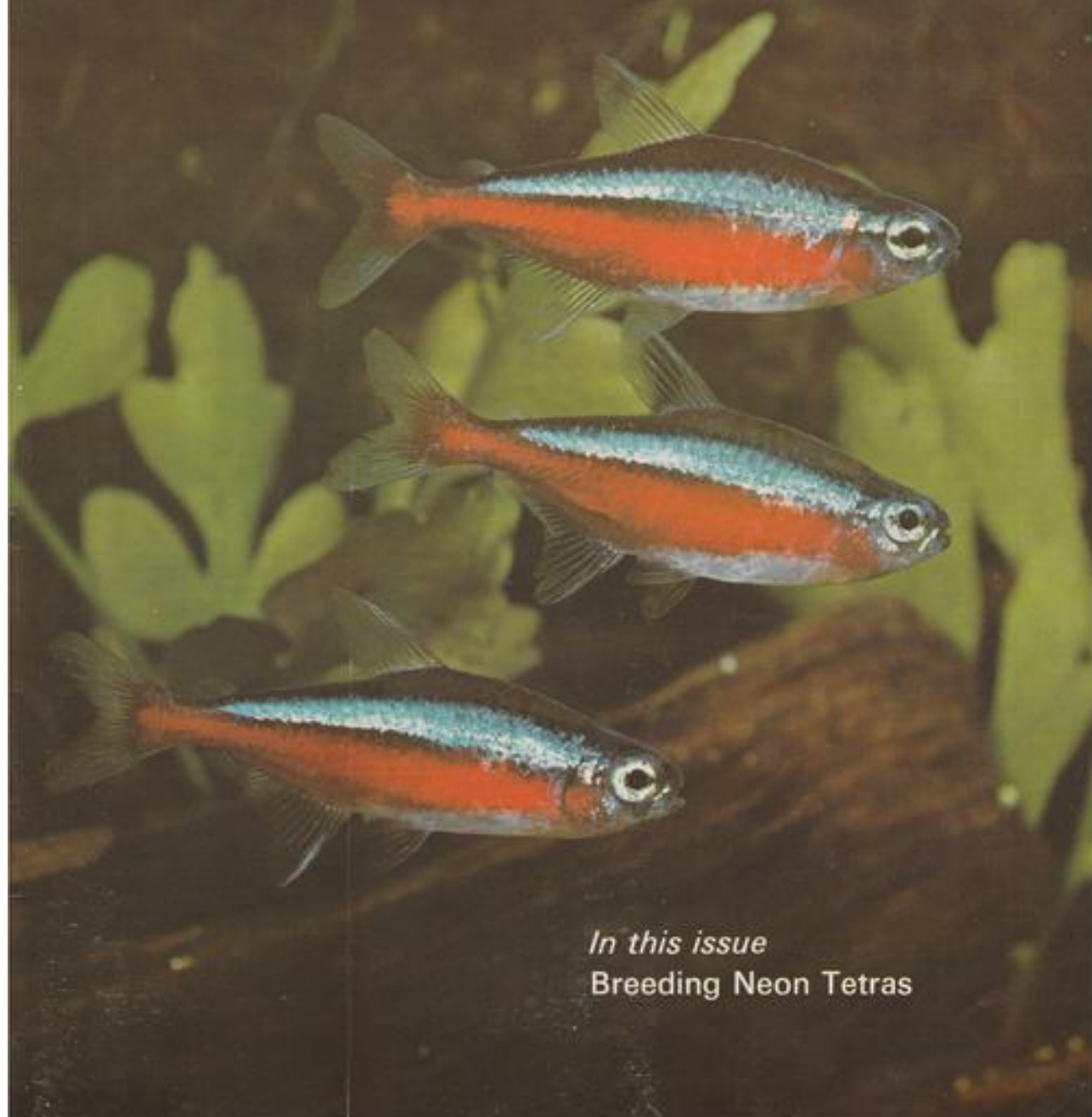


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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



In this issue
Breeding Neon Tetras



THE AQUARIST

AND PONDKEEPER

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The Editor accepts no responsibility for views expressed
by contributors.



Cichlasoma meeki (Firemouth)

What is Your Opinion?

by B. Whiteside,
B.A., A.C.P.

"I bought a pair of five-banded Malawi cichlids, of about 2 in. in length, in May 1979. They were placed in my 48 in. tank along with two firemouths, two severums, two Nevada and four blue acaras," writes Mr. Terry Dunn, whose writing suggests that he is one of our younger readers. Terry, who lives at 1 Annandale Road, Corby, Northants, continues: "The fish were all getting along fine together; then in November 1979 I noticed the pair of banded cichlids cleaning a trench in the gravel in one of the many caves in my tank."

"A week later I noticed unusual movement in the cave, and with the aid of a torch I saw, to my amazement, roughly about 60 fry swimming about. The fry were left in the tank with the parents and began to grow. However, I lost both my firemouths; they were killed by the parents for invading their territory. The young cichlids are now 2½ in. long and doing extremely well. There are six left; I gave the others away to friends."

"The fry were fed on flake food, brine shrimp and *Tubifex* worms. I now have two 48 in. tanks. One contains the cichlids already mentioned; the other tank houses four Oscars—ranging in size from 4 in. to 9 in."

Mr. B. Hurst writes from 37 The Willows, Hedworth Estate, Jarrow, Tyne & Wear. "I decided to return to tropical fish-keeping about seven months ago after a lapse of about six years. I decided to try to breed cichlids and so I purchased a 24 in. × 12 in. × 12 in. all-glass tank—which was a change from a 48 in. angle-iron framed tank on my first venture. I also bought two brown acaras, a porthole catfish and a *Plecostomus plecostomus*. I was also given two blue acaras by a friend."

"The *Plecostomus* is ideal for keeping down the algae. In January of this year the brown acaras started typical spawning behaviour—namely, digging in the gravel and pulling up the plants—*Ludwigia natans*—after they seemed

to be growing well. I had to remove the blue acaras for their own safety because they were receiving a severe pounding from the browns. Anyway, a couple of days later they spawned on a flat rock near the front of the tank. There seemed to be two to three hundred eggs and they hatched out on Friday, 25th January; they became free-swimming on Wednesday, 30th. When they were two weeks old, and after both fish had been exemplary parents, I noticed their numbers were dropping. The male noticed, too, and proceeded to batter the female—who was eating her young at every available moment. I took her out of the tank and after the male searched every part of the aquarium, to make sure she was not there, he allowed the young fish to explore the tank under supervision."

"The 30 or so young have doubled in size since they were born nearly three weeks ago. When they are big enough I will give some away and buy a second, larger tank and try Malawi cichlids next."

Guppies

Master Christopher Haines is 13 years old and a very neat writer. From his home at 32 Eastfield Road, Waltham Cross, Hertfordshire, he says: "My guppies bred recently and I still have the fry. They are showing promising colour. I keep them in a tank containing *Cubomba* and *Vallisneria* and they are doing well. Some of the fry have thick, blue tails, a characteristic of their father—a blue delta tail. A dealer is already interested in the fry. My tank is 18 in. × 12 in. × 12 in. and is heated by a 75 watt heater. The temperature is kept at 76°F and I filter and aerate the water."

"The first food I used was Liquifry, which gave them a good start. When they were past the *infusoria* stage they ate newly-hatched brine shrimps. The next food was a small-flake, growth food which they took greedily."

I feed them on a variety of foods now, but I have found they relish frozen red *Daphnia*—which are very small. All the fry enjoy a meal of chopped earthworms. I was fortunate with my guppies because the females have unusually colourful tails; but they have not had drugs of any kind. The fry like a Tetramin tablet and will crowd round it and pick it to pieces.

"In conclusion, I should say that the fry like a clean—not spotlessly clean—well-planted tank, and a variety of food. Frozen foods are excellent because they are nutritious but do not introduce diseases or parasites."

"My first letter was printed in your column in the November, 1978 *Aquarist* so that saves me writing quite a lot," states 14-years-old Master B. Prys—who left his address off both the earlier and the current letter. He continues: "Since then I've turned to tropicals and have a 27 in. x 12 in. x 15 in. community tank stocked with guppies, platies, harlequins, neons, small angels and dwarf and opaline gouramis—in total 25 fish. I have U/G filtration on for about 22 hours a day; as the pump makes rather a noise and as the tank's in my bedroom it's kept off for two hours by means of a time-switch.

"However much one likes or is interested in a certain species of fish, I don't see how one can bear that species of fish for more than a year without getting fed up with it. I like rams very much—and find them very hard to keep—but if I had a tank of them I'd very soon get fed up with them.

"Concerning your comments in the February issue: I use a top light but not a cover glass. I find a lot of advantages in not having one. For a start, the plants benefit a lot. When I took the glass cover off my tank, my *Elodea* grew an inch in under a week. This might not be unusual but the plants hardly grew at all when the piece of glass was in position. Also, I once got a nasty cut from a bit of glass from my tank. I use Gro-Lux lighting, which I find better than warm white; True-Lite is too expensive for me. I don't think Gro-Lux grows more algae than warm white as is commonly thought—I have tried both—and it does show up the colours of the fish better.

"Talking about money makes me interested in knowing how much readers' tanks, gadgets etc., cost to set up. Mine cost a fortune. I dare not mention the actual amount because although it was my own money my mum would have a fit if she saw the amount in print.

"I don't think any new articles are needed in *The Aquarist*, but I'm sure a reduction in price would be most welcome—though I realise this isn't possible. I nearly fainted when I saw the price of 50p on—actually it was inside, so that people wouldn't get a shock—the November issue. Anyway, I could go on for a long time. Just one more point: wouldn't it be great if there could be a special TV or radio series just for aquarists and pondkeepers? L.B. seems a suitable station because they already have a pet spot. P.S. By the time you print this letter, if you do, I'll probably be nearly 15."

Happy birthday, Master Prys, even if you won't tell us where you live. I know of no radio or TV series about tropical fish; but a local radio station, Downtown Radio,

in my part of the U.K., has in the past broadcast a couple of phone-in programmes on which two of Northern Ireland's experts answered callers' queries about aquaria and fish. If several readers got together in specific areas and wrote to local radio stations it's possible that the stations might consider producing a programme or two for the aquarist. It might be useful if those who wrote passed on the name and address of a local expert who could, if required, answer readers' queries on the air. We tend to get the radio and television that we deserve; so if you don't get what you want, write in and complain; and ask for the kinds of programmes that would appeal to you. I feel that most of us don't complain enough when we receive inferior service or faulty goods. Complaints, when justified, should result in benefits for everyone.

I not so sure that I agree with Master Prys's comment about coloured light showing up the colours of fish—any more than I agree with the use of certain colours of fluorescent tubes that make meat, on display in butchers' shops, look rather redder than it looks in daylight. Do brightly-glowing red and blue colours in fish really look natural? What is your opinion?

Photograph 1 portrays a Firemouth cichlid and photograph 2 shows a beautiful, thick-lipped gourami. Have you bred this species? If so, please send me details. Photograph 3 is a shot of *A. ramirezi*, the ram. Please let me know of your successes or failures with this little gem. Incidentally, someone added an error to my caption underneath a photograph of a clownfish on page 43 of the March issue. The addition 'and anemones' is incorrect. The anemone-like objects in the background were colourful, plastic items used to decorate the marine aquarium that housed the clownfish and its friends.

Algae

Some weeks ago I siphoned about one sixth of the water from my largest aquarium and replaced it with fresh water from the hot and cold taps. The exchange involved no delay and took only about five minutes, during which time the top couple of inches of the glass front, back and sides of the aquarium were briefly left exposed to the air. I had forgotten about the partial water change until, about two weeks ago, I noticed that the normal growth of algae on the front glass was greatly inhibited on the section that had been exposed to the air. I have been keeping an eye on the front glass in question since then and note that although the lower section of the glass continues to support a normal growth of algae, the upper section, which was exposed, is much cleaner and continues to look as if it had been cleaned with a razor blade a week or two ago. Has anyone else observed this phenomenon? I assume that during the brief period of exposure to the air the minute algae plants on the upper part of the glass were killed off; or that many or most of them were killed off. I cannot think of any practical use to which this piece of esoteric information could be put; but perhaps I shall take my razor blade scraper and clean a vertical strip of the glass to observe whether it will grow algae



Thick Lipped Gourami

at two rates or just produce normal, consistent growth from top to bottom. The double-layered sections on either side can act as a control.

No doubt you, as an aquarist, shared my horror if you watched recent television film of Japanese fishermen calmly killing hundreds of beautiful dolphins that they had herded onto an island beach; and no doubt you were equally nauseated by film of Canadian killers clubbing baby seals and skinning them—often before they appeared to be dead. I can appreciate the need for conservation of sea fish stocks, and the need to cull and control numbers of specific mammals, but the sight of such butchering left me with the feeling that the most intelligent life forms must have made their way back into the waters of the earth many thousands of years ago when they discovered how the species called man can so callously treat other species—and, indeed, his own species.

But perhaps I'm being too much of a romantic. I once made a brief visit to an abattoir and made a hasty exit when I heard the lowing of cattle nearby. Perhaps a forced visit to an abattoir would make most of us confirmed vegetarians. One of life's ironies struck me recently as I nibbled fish and chips while gazing at my shoal of cardinals and neons swimming round their aquarium. If I recall correctly, it was Irish playwright John Millington Synge (pronounced 'sing', and not 'sin-ge' as I heard his name pronounced by a lady announcer recently on the radio) who said that death is "... a poor untidy thing." Recent television films confirm his view. What is your opinion on the slaughter of dolphins and baby seals?

Early memories

St. Patrick's Day has dawned—and thoughts of garden ponds and rose planting fade far away as I observe that snow is falling and the temperature is around zero. I must therefore devote my holiday to typing some more of this feature—and I shall continue with a letter written

by Mr. Stephen King, from 1 Danby Cottages, Thornton-le-Clay, who says: "My earliest memory of the hobby is of one night when I was a toddler my father brought me home two goldfish in a sweet jar. They were transferred to a proper bowl and had a long and happy life—until the last survivor died a couple of years ago. Thus I had at least one of them for eighteen years. I always wanted tropical fish but was discouraged by my parents and I accepted their decision. Then two-and-a-half years ago I got married; my wife had a little interest in fish and I developed it. We started off with two goldfish—though in a pond this time—and last summer I saw them spawn and a couple of fry survived. My wife works in a warehouse and a man there learned about my interest in fish and offered to give us a small tank if we wanted it. It wasn't long before I went for it. I set it up for tropicals; and one Saturday my wife and I went to our local tropical fish shop to choose a few fish. The owner is a friend of ours so he sold us some easy-to-keep fish, e.g. guppies, black mollies, tiger barbs and neons.

"Later on my father built me a stone base in an alcove by the fireplace. It has a marble top. It meant I could have a bigger tank—actually 36 in. x 15 in. x 12 in.—so I increased my fish stock with a pair of dwarf gouramies, and some zebra danios and head-and-tail lights. Now my parents have a very keen interest in tropicals—especially my mother. My father is more interested in goldfish so the pool is his main interest; and I have started to use a box filter to clear it. It really does work but I have to replace the filter wool nearly every week for best results.

"When people see my tropicals they always ask for details. Two brothers sometimes visit and they always go to see what's new in the fish stock. So, my hobby has taken off with my family and friends; and now my wife Susan has taken over as the chief fish buyer."

Mr. Andrew Robinson wrote to me from Coleridge 'B', Christ's Hospital, Horsham, Sussex. He said: "My interest in fish started when I saw a friend's aquarium at my boarding school. We are allocated a studying area, in which we can keep our books, called a toyce (?). His fish tank fitted nicely on the shelf that goes with the toyces. I was spellbound by the fish and spent most of my spare time just sitting and watching them. He noticed this interest and said he would sell me a little tank if I was interested. I bought the tank and kept, bred and sold guppies until the holidays.

"My family consists of six members and the house we live in is small. After a great deal of tactfulness and grovelling to my mother I managed to persuade her to let me have this tank in my bedroom. She did not like the idea at all—for funny reasons best known to herself—but it was no trouble and she couldn't complain. Further work on my mother was needed because I wanted a 24 in. x 10 in. x 10 in. aquarium; after a hard battle I won and the tank was installed.

"All went well until Christmas when my uncle bought me a 48 in. x 12 in. x 15 in. tank, complete with equipment. This really threw a spanner in the works and my mum hit the roof! For weeks I had to sit through:

'Why do you ask for such stupid things for Christmas?' I didn't. 'Where the devil is it going to go?' I didn't know.

"This is where my dad stepped in and after calming down my mum he allocated a place for it and it was my responsibility to rearrange the room to accommodate this monster tank. This I did—but only just! It's a tight squeeze in the front room, now. After what could have been a disastrous start, things are now well. My mum actually feeds my fish for me when I'm at school and I am installing a 40 in. x 15 in. x 18 in. tank underneath the other one—and she doesn't mind a bit. It must have been a case of 'If you can't lick 'em, join 'em!' She didn't lick me but I must admit that when the heat was on I wondered, more than once, whether or not it was worth it. I hope you find these details of my beginnings in the hobby to be of interest."

I had hoped, by now, to be able to report on the progress of the spatterdock plants that I ordered, by post, well over a month ago; but unfortunately I have not yet heard from the firm to which I sent my order. Perhaps my order got lost in the post.

Filter wool

Mrs. B. D. Mason is a regular contributor to this feature and her home is at 68 Cavendish Road, Kersal, Salford, Lancs. She says: "First may I say how delighted I am to learn that you too use nothing more than plain, ordinary filter wool. I'm sure the use of glass wool, ion-exchange resins, peat, charcoal—you name it—is all the result of a dastardly plot to make us spend more money than we need to! Now to reply to your queries. My earliest memories associated with fish-keeping are those of my mother buying me two goldfish in the—usual—bowl; and how old I was is just a guess on my part—perhaps about seven. The fish lived for several years and when you think of how they were treated, it is a miracle. They were never fed on anything but 'goldfish food'—sold in small drums much the same as you can buy today, containing what appeared to be smashed up dog biscuits. I must add that I give this to my fish today for a special treat because they love it. They never had green plants in their water—which was changed whenever it grew cloudy by the simple process of running some cold water into the bath—heaven knows why the bath!—and tipping the fish into it. Their bowl was then washed and refilled with cold water and the fish caught in a soup ladle and replaced in their bowl."

"They never got fungus, nor did they suffer from any dietary troubles. They grew large and plump and docile but for the life of me I cannot remember what happened to them finally but I think the seeds of fish-keeping were sown then."

"Both husband, and daughter before she married, were mildly interested—and that was about all. However, recently I have caught my husband, several times, talking to one fish in particular—a comet-tail that he has, for some reason best known to himself, christened Pru—and

very soppy he sounds when cooing to her. She seems to know him and flies to the corner of the tank to him. Most touching!

Careers

In the March issue I published a letter written by Master Robert Clements in which he asked about careers that would be of interest to young aquarists. Mr. Syd Levtsell (?) is a member of Reigate & Redhill A. Society and he lives at 34 Boltons Road South, Horley, Surrey. In response to Robert's request he writes: "... You may be interested in the enclosed Ministry of Agriculture and Fisheries' Information Sheet. I originally obtained it for my son who, like Robert, is also considering making a career of what is to most of us a hobby. I have already sent a copy to Robert; but you may wish to pass on some of the information in your most interesting, monthly W.Y.O. to the many other young enthusiasts who have similar ideas."

Thank you very much for your interest. The leaflet makes interesting reading and could be useful to numbers of youngsters. Subject headings include: Fish Farming—which includes jobs such as hatchery workers, tank attendants, water bailiffs, river inspectors, hatchery managers and head bailiffs; The Work of a Trout Hatchery; and Waterkeeping. Useful addresses given are: Hampshire College of Agriculture, Sparsholt, Winchester; Department of Biological Science, City of London Polytechnic, Calcutta House Precinct, Old Castle Street, London E.1; Department of Pathobiology, University of Stirling, Stirling, Scotland; Department of Biological Sciences, University of Aston, Gosta Green, Birmingham B.4; School of Maritime Studies, Plymouth Polytechnic, Drake Circus, Plymouth, PL4; Department of Forestry and Natural Resources, University of Edinburgh, Darwin Building, The Kings Buildings, Mayfield Road, Edinburgh; The Institute of Fisheries Management, Mrs. J. Gouldsmith, 14 Copenhagen Way, Walton-on-Thames; National Farmers Union, Fish Farming Committee, Agriculture House, 25 Knightsbridge, London S.W.1; Cynrig Salmon Hatchery, Central Electricity Generating Board, 15-23 Oakfield Grove, Clifton, Bristol, Avon B.8; Institute of Water Pollution Control, Ledson House, 53 London Road, Maidstone, Kent ME16; Society of Underwater Technology, 1 Birdcage Walk, London SW1H; and Barony Agricultural College, Dumfries. Of the establishments listed, the only one that I have visited is Stirling University—where I spent a week working very hard at a summer school. I still recall the university's beautiful campus—complete with a delightful lake. It would probably be appreciated if anyone interested in writing to any of the above-mentioned establishments were to include a s.a.c. Interested readers in Northern Ireland might care to contact the School of Biological Sciences, the New University of Ulster, Coleraine. Please don't send your queries to me: I don't have any additional information. The leaflet sent to me is dated July 1979 so the information is obviously up-to-date.



Apistogramma ramirezi (Ram)

Trout hatchery

In tonight's *Belfast Telegraph* I read a distressing account of a disaster that poisoned many thousands of fish at a trout hatchery in Northern Ireland. "Thousands of gallons of a chemical water purifier flooded into a Co. Antrim river . . ." says the news item in the paper. It continues: " . . . 'It was a 95% wipe out,' said Mr. Trevor Wadsworth, a director of the Silverstream Trout Hatchery, at Martinstown. . . ." It would appear that the chemical was accidentally let into the river—which flowed into the trout hatchery. " . . . 'It came down the river and killed everything,' " said Mr. Wadsworth. " . . . 'It came right into our hatchery. We've had everybody working shovelling the dead fish . . . ' he added. . . ." Fish in the River Clough were also poisoned. It's sad to read of such a distressing accident.

Many years ago, when I was a youngster, I visited a salmon hatchery. In the near future I hope to be able to visit a trout hatchery to produce an article for inclusion in *The Aquarist & Pondkeeper*. I hope to be able to take along my camera to record some of the more interesting aspects of the establishment. No doubt a trout hatchery run on a commercial basis is very remote from a few pairs of tropical fish breeding in a home aquarium; however, I'm sure we should be able to pick up one or two tips from the professionals who breed fish for a living. If the weather ever improves I'll make the journey and report my findings.

No. 74 Bulls Copse Lane, Horndean, Portsmouth, heads the following letter—written by 17 years old Miss Elaine Fry. "About 18 months ago I bought two *Aponogeton* plants labelled as *Cryptocoryne* species. The first time one flowered and produced seeds I was advised to let the baby bulbs drop; but my *Corydoras* prevented them from growing. I now have about 60 young plants which I started in a polythene-lined breeding trap with an inch of 50:50 clayey soil and peat based compost in it. They rooted in two or three days; and after a fortnight

were 2 in. tall with 2 in. roots.

"When I planted out a few the *Corydoras* were unable to harm them. They are now about six weeks old and 3 in. tall, with adult-style leaves rather than just spear-shaped—as they produced first.

"Someone suggested I should grow them to a fair size first as bog plants; but on reading that *Aponogeton* are truly aquatic, I have not tried this."

I was pleased to receive a copy of the programme produced by the Midlands Aquatic Study Group for their Open Show—to be held in the Aelfgar School, Tylors Lane, Rugeley, Staffs, on Sunday, 4th May. Mr. Ian Fuller will be the Show Manager; and the F.B.A.S. judges will be Messrs. Bob Esson, Cyril Brown, Derek Lambourne, Joe Sutcliffe, Alan Ibbotson, Colin Turner, Brian Risbridger, Colin Enright and George Hunt. There will be 42 classes and 123 awards. I hope the show will be a success, gentlemen. As a matter of interest, are their many F.B.A.S. lady judges? I shall leave that question complete with its ambiguity.

More guppies

Master Iain Wylie is 15 years old and his address is 21 Lawsons Road, Thornton Cleveleys, nr. Blackpool. Iain says: "Having always read your feature from start to finish, I have also been keen to contribute. I always read your last comments on suggestions for discussion for future issues. This month four of the six suggestions are of particular interest. Guppies were amongst the first dozen fish I purchased when beginning my set up four years ago—Christmas 1976—at the age of 11. These fish, at the time, stimulated a particular interest, mainly because of their beauty. I had been informed, both verbally and through books, that these fish were both hardy and easy to breed. Unfortunately, though, they were too easy, for the first fish I bred were a mish-mash of red deltas and green cobra guppies. I decided to have a go at breeding real quality fish. I purchased five fish, two males and three females, which were red deltas. I put them in a 24 in. tank which was planted with numerous *Vallisneria* and contained numbers of floating *Sumatra* fern to provide cover for the babies. The pH was around neutral—plus or minus one degree; although more likely plus one degree." (There seems to be a little confusion here because pH is not measured in degrees. The neutral point is pH 7.0. A pH of 6.8 would be slightly acidic; whereas a pH of 7.2 would be slightly alkaline. B.W.)

Iain continues: "As all three became pregnant, I chose only one to bear her fry to keep. The remaining two males and two females were kept separate from her. The 12 babies that she had were quite magnificent so I was quite upset when eventually I had to sell and give away some of them to the local aquarium shop.

"I decided to have another go as the results were pleasing. This time I bred some blue deltas—as the shop called them—in the same manner. This time the results were disastrous. The fry looked more like their common ancestors than their stunning mother and father. The

food cycle, incidentally, was Liquifry, the small, powdered, granulated foods, with Biol, and, eventually, growth flakes. Live foods were given about once a week—or when available—from when the young fish could take them.

"Having had all my plants devoured by a rather keen vegetarian orange chromide I was left with a bare tank—bar three *Aponogeton* bulbs. I was faced with a massive layout—for my pocket, anyway—if I bought from my local dealer; so when flicking through the advertisement pages I found an ideal remedy. I chose to order a large tank collection and a few specimen plants from E. Palmer & Son, The Aquarium, Hull. The plants came about a week later in two completely sealed poly/plastic boxes—one containing the collection and the other the specimens. As I had to attend school they were left the day, before I could plant them. At 4.00 p.m. I arrived home, threw down my blazer and tore open the containers.

"After only one week the plants were safely settled in and even reproducing. Now, approximately two months after planting, the Sumatra fern has increased five fold; while *Cabomba*, usually one of my unlucky plants, has continued to push out new, green leaves. All the plants have grown into thick clumps, especially the straight-leaved *Vallisneria*, which look magnificent at the rear of the tank; and the *Sagittaria*, which look equally stunning. The three Amazon swords are regularly putting out new leaves.

"I am very pleased indeed with my plants and can recommend this method—and firm—for purchasing plants. I will certainly use them again when/if I set up a new tank. I am presently in confrontation with my mother to get one.

Filters

"On the subject of internal and external filters: I have used numerous filters, from U/G and poly filters to other, mechanical filters—both internal and external. I have come to weigh up the advantages and disadvantages of both. Inside filters have a smaller filtering capacity but avoid clutter outside the aquarium. Surely, though, clutter is better outside than inside a display tank. I think the boxes, unless they are hidden, do look unsightly. An outside filter causes far less disturbance when it has to be cleaned. Everything taken into account, I prefer outside filters; but that is not to say that I will not use internal filters, though. I prefer mechanical (box) filtration to biological (U/G) filtration; but in my opinion an excellent filter is the poly filter—a combination of biological and mechanical filtration. I received one for Christmas and can only praise it and recommend it to anybody.

"Until recently I thought that power filters were pointless as most of them served to pump water out of the aquarium and then back again. This view changed when I saw a power filter that rested on the side of the aquarium and pumped the water through media at the rate of 110 gallons per hour, and for around £16—the cheapest on the market, so the manufacturers claim. Firstly it draws water from the aquarium via a section

contained in the impeller motor. It is then passed through a foam block; then, in the next section, a charcoal bag. There is a third section in which one can place a medium of one's own choice, e.g. peat—in the special bags that can be obtained. It is an excellent unit and always gives maximum efficiency. The motor is reliable—it contains only one moving part—and requires no lubrication, but still remains virtually silent. It also contains no toxic parts to affect freshwater or marine fish, so they say. It is very easy to clean and maintain."

I was pleased to receive a pre-publication copy of Information Booklet No. 2, which will be published on 31st March by the Newcastle Guppy and Livebearer Society. Copies—price 35p plus 17p postage—may be obtained from Mr. Robin G. Gledhill, at 13 Brancepeth Close, New Marske, Redcar, Cleveland. The booklet is designed to be placed in a loose-leaf binder with Booklet No. 1. (Booklets 1 and 2 may be obtained, price 60p plus 22p postage, from Mr. Gledhill.)

Booklet 2 contains 17 pages, each printed on one side and dealing with one of 17 species of livebearer. Each page is illustrated with one or two drawings of the fish described. Details of proper and common name are given—together with information about distribution, size, coloration, temperature, diet and gestation period; and some general remarks. Species included in the booklet range from *Alfaro cultratus*, the knife livebearer, to *Xiphophorus xiphidium*, the swordtail platy. The drawings are extremely good; and the booklet should certainly be of interest to those who wish to keep some of the common and uncommon livebearers.

I should like to remind readers that I do not necessarily agree with the opinions expressed by contributors to this feature; and I accept no responsibility for the opinions expressed by contributors to this feature.

It's five minutes past midnight on 21st March as I complete this month's column and the ground is covered by a layer of fine snow. Needless to say, my rose bushes remain unplanted. I hope that by the time you read this in June the bushes will be producing stout green and red stems; and while on the subject of plants I feel I should point out that *Aponogeton* species produce a tuberous rootstock and not a bulb. Garden plants such as daffodils and hyacinths produce bulbs; crocuses produce corms; potatoes produce stem tubers; and dahlias form root tubers. All these underground organs act as food stores for the plants and enable them to survive during unfavourable conditions such as cold spells.

For a future W.Y.O. please send me your opinions on any of the following: (a) propagating aquarium plants; (b) frogs in garden ponds; (c) cultivating waterlilies in garden ponds; (d) breeding dwarf cichlids; (e) your experiences with the keeping of native freshwater and native marine creatures; (f) public aquaria that you visit while on holiday; (g) cultivating live foods; (h) feeding baby fish; (i) breeding small tetras; and (j) aquarium shows that you visit. I hope you will send me details of some of your interesting ideas or experiences. I look forward to receiving your letters.

Breeding the Neon and Glowlight Tetras

by F. Garside

BREEDING THE SMALL highly-coloured members of the characin family has always, with few exceptions, presented a challenge to the aquarist.

Success can be achieved if some degree of care is taken to emulate the natural conditions in which these species are found and the writer has achieved some measure of success with the Glowlight Tetra (*Hemigrammus erythrozonus*) and the Neon Tetra (*Paracheirodon innesi*).

Examination of the literature makes it evident that these fishes inhabit very soft acid water, which although clear (i.e. devoid of visible suspended matter) is coloured faintly amber from the dissolved acidic products of rotting vegetation in addition, control of temperature is of extreme importance. Very few of our commonly kept species need temperatures in the upper seventies or low eighties although many aquarists have their tanks at these temperatures. Exceptions to this may be the discoid cichlids, some barbs and anabantids, and rasboras.

There are several reasons why some aquarists maintain these high temperatures for example, activity and colour is heightened, and the ubiquitous white spot disease is less frequently met with. However, the higher temperatures, cause problems too; the water contains much less oxygen, the fishes lives are shortened, and the cost of heating increases, because of the difference between water temperature and the ambient temperature.

Glowlight and neons breed much more readily when kept at 70°F-73°F. In nature the fish are not subjected to bright light and as a consequence plants are relatively scarce. It has been noted that as often as not neons ignore the plants and prefer to spawn in open water.

Breeding technique

A 24 in. x 12 in. tank is cleaned thoroughly and sterilized using a proprietary aquarium disinfectant, the base of the

tank is then covered to 1-2 in. depth with aquarium peat which has been boiled and well drained to remove excess colouring matter which may prove too acidic. The tank is then filled to 8 in. depth with boiled tap water. Fortunately the mains water supply in this area is fairly soft and the idea of boiling the water is mainly for sterilization purposes and probably contributes little or nothing to reducing water hardness. The tank is then allowed to settle for 7-10 days during which the temperature is adjusted to 70-73°F. A few bunches of *Myriophyllum* are added, weighted down with small rocks.

The use of lead is not approved by the writer as it will react with any salts in the water to produce basic lead salts, which are poisonous. It is fact that 70% of lead ingested by human beings in this country is caused by drinking water which has passed through old lead pipes, and not by breathing car exhaust fumes, etc.

Artificial lighting is not employed at this stage and furthermore the tank is shaded so that light is incident only to the water surface. Provision is made, of course, for eventual examination of the tank through the front glass.

When the peat has settled it will be noted that the water, although crystal clear has a distinct amber tinge.

A pair of well-matched fish can then be selected. The writer uses a method of transferring the fish which ensures that as small an amount as possible of the original water is transferred to the breeding tank. First the fish are netted into a container of their original water, which is gradually replaced with the acidic water over a period of a couple of hours. After sterilization of the net the fish are again netted into a second container of water from the breeding tank. Finally they are caught again and put in the breeding tank, preferably in the late afternoon. The fish are allowed a few hours to become accustomed to their surroundings then the tank is blacked out. In the morning the cover is removed. This can be done at a time convenient to the aquarist.

The fish will start to 'take notice' of each other, the female normally starting the procedure. After a short time the male will take the initiative and make periodical dashes at the female. In the case of Glowlight an actual 'embrace' occurs, Neons have simple side-by-side bodily contact it has been noted that Glowlights lay 10-12 eggs, compared with 4-6 for Neons, which incidentally are the more avid egg-eaters. After the fish are depleted, in 2-3 hours, the pair are removed and the tank blacked out. After 36-48 hours careful examination will disclose the almost microscopic fry 'hopping' around on the peat, or hanging from the glass. The fry are fed in the usual way and will be 1 cm. long in two weeks, with the first signs of colour.

The writer considers that the important factors are:

- (a) Absolute cleanliness;
- (b) Condition of the adult pair;
- (c) Adequate food provision for the alevins;
- (d) Soft acidic water;
- (e) Temperature and lighting control.



From a Naturalist's Notebook

by Eric Hardy

APART FROM Universities and Polytechnics and ten water authorities, eight other Government or national bodies are concerned with research and investigation into Britain's freshwater fishes, under a Joint Freshwater Fisheries Research Advisory Committee. Their first need is to improve the technique for assessing fish-populations in large and deep waters, and how to manage such stocks. The way migratory salmon and sea-trout find and ascend their home rivers to spawn on return from the sea, needs a better understanding of the freshwater flow requirements of such fish in our estuaries. Britain's ice-free winters give such fish a far longer upriver run than American rivers.

The recent Edinburgh symposium sponsored by the International Atlantic Salmon Foundation and the Atlantic Salmon Research Trust noted the increase of spring fish in recent years and a corresponding decline in Scottish rivers of the large run of summer grilse. No fish has been subject to more literature, money, laws and research than the salmon. Despite this, and the new knowledge of artificial rearing, of genetic variation in 2,000 strains and management in floating net sea-pens, cages and onshore enclosures, time is running out on saving the Atlantic species from extinction. The symposium is summarised in *Atlantic Salmon: Its Future* (249 pp, by A. E. J. Went the Irish salmon expert, Fishing News Books, £10.70).

Recent revivals from The Thames to Connecticut River suggest the danger has been over-generalised from local exterminations. Salmon still run into French rivers so far south as the Adour, and recent losses were due to the since declined disease, ulcerative dermal necrosis. Hatchery-reared grilse and smolts from Scottish eggs have increased the River Nivelle's stock by 58%. Danish and Polish sea-trout eggs have been imported to improve stocks in Normandy, and sea-trout, with a shorter sea migration than salmon, have started to appear in Mediterranean rivers. There is more salmon-policy than biology in the book. But with a dozen or more gene groups in a big salmon river, it stresses the importance of genetically inherited characters in modern salmon-breeding, like new streamside incubation-boxes.

Many of these symposia give us a bin full of facts from obscure research, soon to be ignored like the previous 1972 salmon symposium. The latter is unlikely this time because of the rocketing value of salmon commercially. The Pyrrhic victory of modern technology which makes deserts bloom and rivers die in a hostile, unforgiving environment is the first obstacle. A severe drop in young salmon stocks in Sweden was due to a dearth in their invertebrate food caused by local industry's discharge of heavy metals. Dense afforestation does this by overshadowing Scottish rivers. Seaward-migrating smolts are imprinted with very diluted chemical clues of their home river, which they use to distinguish it at their homeward return to the estuary. Some become involved in oceanic eddies for movement, and require active navigation only at critical points, such as the final identification of their home river. Their mechanics of orientation are triggered off by pituitary gland response, and it may be possible to breed for genetic control of this.

Natterjacks

In February, I joined Nature Conservancy and British Herpetological Society officials in pegging out scrape-sites for future natterjack toad-pools in two small reserves planned on the proposed new golf-course site on south Formby (old west Lancashire) dunes. These are at Ravenmoors (between the caravan-camp and Alexandra Road) and at Cabin Hill, the rifle-range end of St. Luke's Church Road. It settled a long-standing dispute where

the same dunes were wanted intact by botanists, and excavated for natterjacks. Both include areas of bog-plants, chiefly grass-of-parnassus (the large variety *condensata*) and the variety *maritima* of round-leaf winter-green. The plan is to fence them after bulldozers scrape-out the spawning pools, sufficient to maintain water at least to May. *Littorella*, the shore-weed, is slowly recolonising the Cabin Hill pools and the creamy white variety *ochroleuca* of marsh heliochrome orchid grows nearby. Water-holding pools excavated further south on West Lancashire Golf Course will also aid the natterjack's southernmost breeding site there.

In previous years, immature natterjacks trapped in road-drains in Formby have been transplanted to duneland. Hybrid rushes *Juncus balticus effusus* have been transplanted from coastal dunes to a newly-dug pond on the nearby rifle-range, only to suffer competition from colonising grasses.

Identification

AIDGAP is not a charity to help aquarists bled dry by our enormous water-rates, but a scheme to aid the identification of difficult groups of animals and plants by means of trial keys which, after the usual scientific refereeing, are distributed to many potential users for a critical feedback after 12 months' testing, for revision before the final version. The Field Studies Council (Juniper Hall, Dorking RH5 6DA) have sent me Sue Hiscock's *Field Key to British Brown Seaweeds* (44 pp illustrated by over 60 line drawings, £1.25), produced under this project. This is certainly the most practical guide to the midwater of the three main seaweed zones of our rocky seashore, for schools or amateur beachcombers alike. It is a minor matter that it is not conveniently pocket-size for field-use, it doesn't give an index, and a few more synonyms than those since Newton's 1931 British Museum handbook would help those still with grand old books like Mrs. Gatty's drawings.

Identification depends upon the shape of their holdfasts or anchors, lumpy spore-cases and air-bladders. From the large Japanese *Sargassum muticum* spreading along the Solent, there are six additions since Newton's handbook. A £7,100 grant was made the other year for a Portsmouth biologist to conduct a two years' study, ending this autumn, on whether the Japanese plant can out-compete native seaweeds by shading effects.

Water plants

Aquarists, pondkeepers and anglers will find even more useful the illustrated key to *British Water Plants* by Haslem, Sinker and Wolseley, which the Field Studies Council produce at an economic £1.60 for 109 pages, including 28 plates of line drawings. Though the distribution notes are very brief and generalised there is an index and this is especially useful for indentifying the difficult submerged pondweeds, including the rare aliens in canals and lakes, many originating from aquarists' surplus stock. There are practical hints on collecting,

notes on aquatic plant communities and their various habitats. It covers 153 species and is not too technical for the average reader. This was produced before AIDGAP was adopted, but the latter will include a guide to *Salix* (sallows and willows) and their hybrids, at present in the test stage, also crabs, marine diatoms (in test stage), British flies and slugs. They have also published an ingenious *Lateral Key to 30 Common Grasses*, by C. A. Sinker, for an economic 60p.

Less confusion

One notable aid to less confusion in the study of native fishes is the acceptance by the House of Commons in February of the Bill prohibiting the introduction of alien fish to our waters, in view of the damage zander have done to native fish in East Anglia. Constant transplanting of native fish like barbel to Severn and Ribble, makes the study of fish-distribution of only temporary interest in many cyprinodont species. Some species are not only found outside their normal range but like many trout ponds in water where they will not breed. This may be necessary for restocking expensive angling waters, but a better record should be kept of introductions.

The other is in nomenclature of sea fish where the Food Standards Division of the Ministry of "Ag. & Fish" is asking for complaints and suggestions by September over the confusion in trade names duplicating many marine species. Under the 1970-72 Labelling of Food Regulations, rosefish is unauthorised as a pseudonym for redfish, though still widely used with ocean perch and Norway haddock. "Salmon" and "rockfish" cover a multitude of usurpers of the rightful name and we still see newspapers calling zander a hybrid pike-perch when it is a large perch unrelated to pike, as its dorsal fins show. We still have a brook-trout for a char; our grayling is not the Atlantic lake salmon called this in Canada; American flounders are not so closely related to ours, and their Greenland halibut is a turbot. Several years ago, the Hague Court's judgment in a Norwegian dispute inspired our White Fish Authority move towards standardising the names of our fish, without much effect, excepting in official publications. "Cod fat" in the food trade is from cattle, not fish!

Tadpoles

It was back in pre-war days that one first noticed that birds like blackbirds and robins sometimes catch and eat wriggling tadpoles; but a bird magazine only recently realised the habit is commoner than books admit. Starling and house-sparrow also take them on occasions. The blackbird sometimes eats frogspawn. A blackbird once took a 4-ins. trout and flew off with it; others have taken newts, and one reared two families on minnows in Scotland. A pike attacked an adult moorhen at Rye Meads sewage-works pond, Hertfordshire, and in Cheshire this spring, a friend's cat sat by his garden pond at Neston, pawing out frogspawn and eating it.



Some of my own Koi

An Introduction to Koi *by Hilda Allen*

DURING the coming months, many people will be setting out to buy more Koi for their ponds with the full knowledge of exactly the names and varieties they require, and the points to be observed regarding the health of fish which attract their interest.

These fortunate (and sensible) people will probably be members of a British Koi-keeping Society with ready access to a wealth of information and will have gained practical experience through both National and local activities in seeing ponds, visiting Koi shows and enjoying discussion with fellow enthusiasts.

A great deal has been learned about keeping Koi in Britain through the past ten years, and, largely resulting from the efforts of a handful of amateur fish-keepers in the early nineteen seventies, Koi are now tremendously popular and this coloured variety of carp is available at Water Gardens, Garden Centres and Pet-shops and not forgetting the specialist suppliers and breeders.

It is probable that many people will be seeing Koi for their first time, they will almost certainly be impressed by their beauty and although perhaps not knowing what the fish really are, except may be as large, pretty goldfish, some difference will soon be apparent when they choose a dozen large ones—and then enquire the price.

Koi are expensive when compared to the usual pond fish as practically all are imported by airfreight, mainly from Japan where these beautiful carp were originally developed from the common carp (*Cyprinus carpio*).

Carp were raised primarily for food, being bred in

the open waters and rice paddies of Japan; in the Niigata Prefecture of North Japan the long severe winters and deep snows confined people indoors and made carp-breeding outside difficult. Local farmers made indoor ponds and carp-raising became a hobby during the colder months. Although important as a source of protein, carp were often regarded as family pets and so it was natural that any unusual mutations of colour would be noticed and those carp kept for breeding. During the summer the farmers held competitions and vied with each other to produce ever more beautiful and coloured carp and by 1870, through selective breeding, perfected the red and white Koi known as KOHAKU.

In 1904, Dr. Franz Dolflein, director of the Royal museum in Munich, sent 40 fry of the German scaleless and semi-scaled carp as gifts to Japan but only 7 survived the journey to Yokohama, a voyage of 40 days at that time. Of these 7 original German carp, only 4 female leather carp and one male mirror carp lived to be crossbred with the Japanese carp and establish further variations based on scale type. Today, the Japanese word "DOITSU," meaning German, is used as a prefix to describe scaleless or semi-scaled Koi.

As more pedigree lines were established, Koi became very popular throughout Japan and in 1914 the beautiful carp from Niigata attracted large crowds to the Grand Exhibition in Tokyo. It was at this time that they were named Nishiki-goi, the word "Nishiki" is from a silken, patterned fabric and "goi," or "koi" means carp. Genetic-

ally, all Koi are of the same species but are available today in an enormous variety of brilliant colours, patterns and scalings. The highest tribute must be paid to the Japanese farmers, and later the commercial breeders who, by selective breeding, stabilized the colours and patterns, established pedigree lines and continue to produce ever more beautiful varieties to delight the eye.

It is impossible for me to describe the enormous number of variations presently available, but a short list may shed a little light on some of the more popular and easily obtainable varieties for the real beginners to this fascinating hobby of keeping Koi.

The ever-popular golden Koi, known as OHGON, was developed in 1946 by Mr. Sawata Aoki of Niigata after 25 years work to produce this metallic variety which has since played an important part in the development of other varieties. As a result of cross-breeding there are now shining golden, silver and orange-coloured OHGONS. A Koi known as HARIWAKE OHGON has a body clearly divided into definite gold and silver patterns, the KIJAKU OHGON is named after the peacock for its mixture of brilliant colours. Any Koi having scale variations other than the normal full scale type is called DOITSU, e.g. DOITSU OHGON, DOITSU KOHAKU, etc. There are many names for the different red patterns on the white body of KOHAKU but the most popular is TANCHU KOHAKU, having one large red spot on its head and a white body.

SHOWA SANKE is a black Koi with red and white patterns which has been produced in the era of SHOWA (1926—today) TAISHO SANKE is also a tri-colour with the basic colour being white, with red and black patterns in the dorsal area (TAISHO era 1912-1926). SHUSUI are DOITSU (German) type Koi produced by crossing German mirror-carp with the blue Japanese ASAGI. The back should be blue with scales in neat rows, some silver scales may appear and when there is red on the abdomen and cheeks these Koi are considered very beautiful.

BEKKO means tortoiseshell and originated from TAISHO-SANE but differs by lacking the red or white colours. If there is no red, but a black pattern on a white ground it is called SHIRO-BEKKO, (white tortoiseshell). It is AKA-BEKKO (red tortoiseshell) if there is no white but a black pattern on a red background.

This situation of endless varieties with unusual names can be confusing for newcomers but is less important than other facets of successful Koi-keeping. Experience shows that Koi are often seriously stressed before purchase and losses can be attributable to conditions of travel, water changes, rapid fluctuations in temperature, etc. To deal with the subject of buying Koi is extremely difficult but the intending purchaser must be prepared to take time and trouble to provide a good home before either rushing out to buy Koi or worrying unduly about varieties. The price of Koi may produce a severe state of shock initially, but it is not usually necessary to sell the car or mortgage



Author's Koi-pond with separate quarantine pond on right.

the house before beginning with medium-sized Koi of between six to ten inches long.

Choice of varieties is entirely a personal matter but health should be the main criterion in selecting Koi. Body shapes may vary but when viewed from above the fish should have a smooth, flowing outline; any that appear wasted or give the impression of an over-large head, or in which the body may be pinched-in along the back, are not recommended. Scales should lay flat and skin should appear shiny; patches or dullness in the natural mucous coating may indicate problems. Koi with any wounds, swellings, lumps, pimples, holes, etc. should be avoided. Dull or sunken eyes, fins held close to the body, difficulties in using gills and/or mouths or where a fish appears sluggish, cannot maintain an even balance or stays on its own are good indications of sickness. It is wise to look for external parasites such as fish-lice, anchor-worms or white-spot.

The careless introduction of any disease or parasites into a pond will create enormous problems thereafter. No one can assume new purchases are free from trouble and the onus is on the buyers to first choose wisely and then to strictly observe the vital need to quarantine new stock.

Apart from disease, Koi are frequently upset by being moved and can be affected by changes in water, so that if kept separate for several weeks at least, this will give some guide to their health, allow observation and easy access if troubles occur. I would hope that readers, especially any new or prospective Koi-keepers will not be deterred by my warning noises on purchase and quarantine.

These are intended to protect amateur Koi-keepers and further the interest in British Koi-keeping. During the coming year members of the British Koi-Keepers' Society will be holding several regional Koi-shows; those known to date include Sunday 15th June at Ware, Hertfordshire; Sunday 6th July at Tatton Park, Cheshire; Sunday 10th August at Diss, Norfolk and Sunday 7th September at Ashton Court, Bristol. The Society's National Koi Show, "Koi '80," will be held at Bressingham, Norfolk on Sunday, 14th September. The British Koi-Keeper's Society with over 1,300 members is the largest independent Koi-keeping Society outside Japan.

Commentary

by

ROY PINKS

-- the Damselfish

SO FAR AS the main marine families and our expectations from them are concerned, the Damselfish probably come nearer to perfection than any of the other groups, yet they are perhaps the least appreciated. Some of the worst sort of snobbery in the whole hobby of fishkeeping exists in the tropical marine area, where some silly folk will pay astonishing sums of money for not especially exciting fish, simply because they are rare and expensive. That they are correspondingly difficult to preserve for any length of time is an aspect which does not enter their empty heads until too late, but there is little we can do to alter the sense of values of those who put personal prestige above living animals.

Those who show better sense, and many are mere beginners at marines, will very quickly realize that most of the tropical marines are comparatively cheap, nearly all are amazingly hardy, and most have colourings and habits which make them unique. I know of few Damselfish which are not aggressive, but some are more so than others, and the trait itself, if managed sensibly, need be no real bar to the gradual assembly of a collection of fish which will provide, with just a bit of luck, several years entertainment and interest and outstanding decoration. Even so, many aquarists do fail even with Damselfish because their collection technique is faulty, and I will suggest how this may be improved.

Damselfish, on account of their toughness are generally reckoned to be the best "starter" fish in newly set up marine aquaria, because they are more able to withstand the stresses of the high nitrite levels which persist for several weeks, until the benefits of the growing colonies of denitrifying bacteria gradually begin to operate in our favour, permitting more fish to be kept within the available volume of water. What so often happens is that a tank is initially stocked with one or two of these fish, not all of which survive. Those which do are often weakened internally by their fight against the poor conditions, and emerge from the ordeal mere

shadows of the wonderful creatures which entered them. It is perhaps better, when the nitrite levels are satisfactory, to remove the starter fish and put them into a seasoned tank, on their own, to recuperate. When in full condition they can be added to any collection of other fish with which they are compatible.

What, then, should be decided upon as initial stock for the new aquarium? The usual practice is to pick up as many different species as possible, and to introduce them just as they become available, always remembering that you never add a fish smaller than any already in residence, nor one with a reputation of a meeker nature: but "meek" is not an epithet properly linked with the Damselfish, as they are all ferocious to a greater or lesser degree. The mixture of specimens which customarily ensues often looks scruffy and nervy, and better results are often obtained by pre-determining which species best suit your taste, and then buying several specimens of each. By this means you can usually select the best specimens of the bunch, which is always a good start. Introduced all together they take up their individual quarters almost by instinct, and there is far less quarrelling than when single fish join the collection.

This group of fish is strongly instinctive as regards possession of a "home", which it defends against all comers, sometimes to the death. We often fail to provide the right quantity of hiding places in our aquaria, simply because we choose corals for their decorative value rather than for utility. The smooth contours of brain, fungus, and cup corals are quite useless for our Damselfish, which like to sink swiftly into the comforting niches provided by finger, lettuce and branch coral, and consequently the tank should have a high proportion of its surface taken up with this material. There is no need to keep more than one species for the achievement of maximum visual impact. I know of few sights more arresting than a tankful of the Yellow Tailed Blue Damselfish (*Pomacentrus melanochir*), which is usually a miniature, less terrible than most of the others, and possesses an unbelievable blue of a richness unmatched by any other fish in this group. In fact, probably only the temperamental Regal Tang comes anywhere near it, and when you compare the prices, real value is absurdly on the side of the cheaper fish. If given a reasonably varied diet of live, frozen and dried food, Damselfish should really prosper, but many of them will do astonishingly well on the unimaginative diets which busy people usually revert to after the early heady days of pampering their new acquisitions. I have had one of these little fish for nearly two years now, and it has been fed on little more than Phillips flaked fish food, which suits all my charges, whether freshwater or marine.

As to cost, most of the damselfish are priced below £3, and some below £2—rather depending on size. So for £10 you could stock an average sized tank with a little group of Damselfish, which would give long lasting entertainment. Some species are inclined to shoal, but others tend to more of a solo performance. Kept in small groups like this one is more likely to learn something about the true habits of the fish than by indiscriminate collecting. I will discuss some of the species separately.

Pisciculture or Ichthyology ?

by D. D. Sands

HAVE YOU ever paused to consider how the 'shape of things to come' will effect the aquatic hobby as it speeds along towards Orwell's prophetic year? To speculate on this future it is advisable to look into the past and review the present; the results could show us the direction in which our watery pastime is rippling.

In recent years we have seen internal thermometers give way to the 'digital' and iron frame aquariums (thankfully) concede to the siliconed, 'all glass affair.' Balanced aquariums, planted and stocked in measured weights, to support a natural cycle, stampeded by the constant velocity undergravel filters and power filters which allow overfeeding and overcrowding by the most experienced and inexperienced aquarist. Tungsten bulbs have faded against the Grolux strip lights, primed by ballast units, they help to enhance the colours of fish. Trulight (too cold a light without Grolux) has yet to gain the recognition it deserves—one day it will blaze an aquarial trail to become a standard accessory. The standing arguments for and against undergravel filtration—economics versus plant growth, would not exist if the charm of the ultra-violet Trulight was recognised as *the* plant saviour.

Air pumps

Aquarium pumps available today can be an aquarist's nightmare; complaints of irritating vibrations akin to Concorde lifting into the air are very common. The perfect pump (an engineering dream) seems to have to cost more than the whole aquarium set up and recently imported models priced equally with existing pumps have not lived up to the marketing and ensuing sales. These

pumps are priced within a range of £4.00-£12.00 which should mean it is viable for a manufacturer to provide a reasonably efficient *quiet* pump. Most aquariums take pride of place in the lounge so a pump which is for ever making its presence felt could create a destructive image for the total hobby.

Remedies

Many remedies, water chemistry adjusters and test kits have brought the hobby light-years away from the lead-bottomed, flame-heated aquaria of Victorian days. Heating aquariums is a subject which still belongs to the age of cricketing and rugby heroes. Several years ago aquarium heaters had to be redesigned to comply with the amended electrical regulations. Manufacturers rushed out to meet the new standards and since then, to this day, use it as an excuse for a high percentage of faulty aquarium heater/thermostats. I have often pondered if the manufacturers stop to consider how a heater can hold, sometimes hundreds of pounds of livestock, in obedience. We are in the age of the silicon chip—watches run on this minute power source, way past the point where we remember how much they cost. Why cannot manufacturers harness this for the hobby? Heater/thermostats are not cheap yet appear monstrous hanging inside aquariums like Frankenstein's test tubes.

Technically, many inroads have been made during the last decade, so many that a would-be aquarist can have attained 'experience' within the year his aquarium was first filled with water. (Squirted, of course, with de-chlorinator, plant food and numerous tonics).

Books

Books such as Sterba's *Freshwater fish of the World* once stood between any argument of identification—now some aquarists could well flatten a debate by citing a scientific work because it supersedes work completed a century before. These days there is no longer a 'Bible' from which aquarists can read the gospel for a book is sure to be out of date as soon as the pages are glued into the spine. Opinions within the hobby fly from every direction, experts are enthroned then often overthrown in the same moment.

There appears to be a current trend in which aquarists desire to understand the science of the hobby, 'Ichthyology' and from this there has been an accompanied shift away from simple behavior and breeding studies—towards a scientific approach with great interest shown in the relationships and taxonomy of fishes.

Identification

Identification seems to be the motive, not simply on a family or generic level but on an 'under the microscope' species level. With scientists unhappy to define just what determines a species, aquarists feel able to penetrate the world of Ichthyology, once a very distant world of 'secretive white coated mumblers in ivory towers' speaking a language known only to themselves.

Continued on page 53



Two-spot livebearer is one of the more unusual species occasionally available in this country.

The Basics of Breeding Livebearers

by Gordon Lennox

MOST NEW fishkeepers seem to have been finally won over to our hobby when they have seen a guppy or a platy give birth in their first tank before their very eyes. This opens up a whole new vista for them, for up until now the aquarium has been little more than a pleasant addition to the living room that has needed cleaning out every week or so. The interest that was possibly waning after the first flush of enthusiasm is now rekindled with even greater fervour—and here lies the danger.

Tanks begin to sprout in the oddest places around the house. On sideboards, in cupboards, in the bedroom, in the kitchen, until even the wardrobe becomes a sort of miniature fish house and when your wife forgets this fact and puts her best dress into one of the breeding tanks she puts her foot down firmly and calls "Halt!"

The trouble is that the new aquarist with this new found expansion to his hobby doesn't quite know what to do with all the fish he is breeding. He hasn't the heart to feed them to his other fish and the man in the local pet shop will only take them when they reach a certain size. So what happens? Our poor fellow reaches a stage where he can't cope because he has hundreds of runts and more and more on the way. He has nowhere to put them and no-one to give or sell them to. So his interest begins to wane again. The fish get neglected because he finds he hasn't the time any more and most of them probably die through lack of food and foul water. In a few months it is all over and the hobby has lost another fishkeeper who plunged in where established aquarists fear to tread without first finding out just how deep the water is.

Livebearers, by the very nature of their reproduction, are easy fish to breed. It is easy to distinguish the sexes because the male has his anal fin modified into a tubelike intromittent organ called a gonopodium. And it is easier to raise the fry because they are so much larger than newly hatched egg-layers when they are born. Added to this is the fact that most of the females are able to produce several broods from one fertilisation. All this gives you a head start but, like everything else, there are ways to go about breeding these fish without your wife leaving home or you ending up with a nervous breakdown.

All it really needs is a little planning and forethought—and, perhaps unfortunately, a little streak of ruthlessness. Basically you have to steel yourself to only keeping a handful of fish out of each brood because otherwise you are going to find yourself in the same situation as our friend earlier on.

Just suppose you started off with two pairs of platies and saved every one of the first brood from each. A full grown fish can produce around 80 youngsters each time she gives birth so that would give you 160 fish to start off with. In four weeks the parents have bred again so you have another 160 or so, and in another four weeks another brood, and then another. By which time the first brood are old enough to breed themselves and assuming you manage to raise all of them to maturity you now have 84 pairs of fish all producing another 80. Then, of course, the second brood from the original parents matures and another 80 pairs start producing. The figures suddenly become mind-boggling and you find yourself cramming tanks with fish which have no chance of ever growing up.



Ameca splendens is a member of the Goodeid family which have several peculiarities in their breeding habits.

Now I appreciate that you are never going to raise every fish in every brood no matter how hard you try but even with a fifty per cent mortality rate you are still going to end up with thousands of fish in just a few months—all runts which you won't be able to give away let alone sell. All they are fit for is Oscar food, and he may get a bit fed up on a diet of platies after a couple of months or so.

To be fair to the fish (and your family) you can really only keep about 15 or so from each brood. These few will then have a chance of reaching maturity and if you separate the sexes as soon as they become evident, you can control the breeding and save an embarrassing and uncontrollable population explosion.

It is not even too difficult to go in for a modest line breeding programme that will ensure that you always have lovely looking fish in your tanks that have not deteriorated through too much inbreeding or too little growing space.

But let us start with the community tank. If this is all you have it is perhaps best to simply let nature take its course. Some fry will survive but the majority will get eaten by the parents and the other fish and this will simply maintain a steady growth in the population of your tank.

If you can lay your hands on one or two extra tanks then you can go into things a bit deeper. To start with you can put your heavily gravid (pregnant) females into this Albino swordtail is one of the rarer varieties which is harder to raise from the fry stage as it is less hardy than other types.



Xenocata eisneri has become one of the most popular members of this group of odd livebearers because of relative ease of breeding.

extra tank before they give birth in order to save as many fry as possible. This will mean that you choose those which are to survive rather than the other fish. Make sure that the tank is heavily planted with fine leaved plants, or floating plants that have fine roots, so that the youngsters can escape their mother's appetite.

On no account do I use a breeding trap of any description for the females to deliver in. I find them far too small for all but the smallest females such as Mosquito Fish to deliver in, and as they have special requirements anyway, I don't usually use one for them either. There is also the possibility that netting a gravid female and putting her into a very confined space will cause her to miscarry and give birth prematurely. The only time I may use a breeding trap is after the young have been born in a community tank. Then it can be suspended from one side of the aquarium and the youngsters put in it to grown on a little.

Using a separate tank is far better, however, as the fry will have more room from the start and will not be competing for food with bigger fish.

Young fish need to be constantly watched and culled, to make sure that you only keep the best even when you have them in a separate tank. Those that are deformed or show bent fins should be disposed of to leave room for the other more perfect fish to grow. Careful selection Platies. Red Wagtails are firm favourites and are easy fish for the beginner to learn breeding techniques with.



should leave you with your 12 or 15 or so, and that is enough to raise to maturity in a two foot tank.

They need to be given plenty of live food and high quality flake 'growth' food if they are to grow as big and as fast as you want them to. If you are going for big fish then the more space you can give them the better. It should always be remembered that with most of the common species of livebearer, an early developing male will remain stunted and not reach his full growth.

You don't have to place the females in a tank every time they are due to give birth because then we are going back to the population explosion again, albeit on a smaller scale. Wait until your first brood has grown up before starting again. That way you only need two tanks for the whole process. Extra tanks would mean that more fish could be bred, but it could also enable you to try your hand at line breeding.

This does take rather more work but the results can be very rewarding.

You would need a minimum of four tanks to start with and others later on if you wish to raise larger numbers of fry.

The tanks would need to be a minimum of 18 in. x 10 in. x 10 in. for guppies and 24 in. x 12 in. x 12 in. for platies and swordtails and most other livebearers. If you have some virgin stock then select your best pair and put them together in one of the tanks to mate. If not, then select your best pregnant female and put her into what will become the delivery tank.

After about three weeks the male should be removed from the virgin pair and the female left to produce her young alone.

In another two or three weeks she should be ready to produce her first brood of fry (the actual pregnancy term will vary according to species, temperature and even the amount and quality of food given) and when she has given birth she too should be removed.

She can either go back into the community tank as you will not have the space or, if you do intend getting other tanks, she can be put into a spare one to produce her next batch of fry. She will not need mating again as most species of livebearers can produce several broods from one mating. The exception to this are the Goodicid species but the beginner is best leaving these alone. In any event the female should be kept on her own for a day or two to recuperate before putting her back with male fish.

The fry should be fed as well as possible and inspected daily to ensure that any deformed fish are weeded out as soon as they are noticed. With some species sexual characteristics begin to form as early as three weeks and it is safer to remove any definite females into a second tank as soon as they are spotted, leaving the males with the 'can't tell's.'

You can usually pick a female by a darkish area round her vent which will become very prominent once she starts breeding. When very young the area may only be a little darker than the surrounding skin and spotting this is very difficult at first, but becomes easier with

practice.

You can do things the opposite way round and pick out any males as soon as you spot a slight thickening of the anal fin, but it is slightly more dangerous as it only needs one male to slip past unnoticed and he will fertilise all the females he can, long before you want them to mate. With some species however, such as the *Limias* for instance, sexing out can take five to six months or even longer.

As the fry's characteristics begin to develop you have to be very ruthless and by careful selection and culling keep only the ones which match up to your standard or have the attributes you want to keep. Any fish which don't match up can be fed to your other fish or given to other hobbyists.

The final stage is selecting the best mates from your first generation. If you have stuck to smallish tanks you will probably have no more than ten fish in each, and in a four tank system second, and possibly third, broods from the original parents will have had to be discarded. You need, in effect, a further three tanks for each generation (one for males, one for females and one for breeding) for each generation you want to keep. Ten tanks is probably the least you can get away with if you want to maintain two parallel strains from the original parents, culling down each brood by two-thirds to three-quarters. If you want to keep more fish you will need a couple of three or four foot growing-on tanks as well.

Don't make the mistake of putting youngsters in the community tank to sex out and grow on. Apart from the obvious difficulty of spotting the sexes, you will probably end up with smaller fish as they will have to compete for food with the fully grown ones. There is also a school of thought which believes that mature fish of certain species secrete some substance into the water which inhibits the development of the youngsters if there are too many of the same species in a relatively confined space. This has been shown scientifically with platies and it is certainly true that the males seem to sex out very early and remain stunted if raised in a tank with older fully grown males.

You can now either breed brother to sister if your strain is already an established one, or parent to offspring if you want to fix new characteristics. Put your selected pair in the fourth tank and the whole thing starts again with the fish from the first generation being moved to other tanks or aquarists once you have chosen the ones you want to keep.

Brother to sister and parent/offspring matings are known as inbreeding, and while they ensure a strain stays pure, they also carry some risk of genetic deformity creeping in. The second and subsequent generations from close matings must be very carefully watched so that deformed stock can be weeded out as soon as possible to prevent the deformities being passed on.

It is still better to introduce a new line after four or five generations, possibly from a second set of tanks which have carried a parallel line from the original parents, or from another aquarist who is breeding the same strain as you are. This again reduces the risk of deformities

and helps to strengthen the strain with new blood.

That is the basic outline of the system which many aquarists modify to suit their own requirements, moving the fish on to larger quarters for further growing on after they have selected the next pair of breeders.

Livebearers also provide much scope for experimentation and the crossing of two established strains of the more popular species such as guppies, platies or swordtails can lead to a new and beautiful strain being developed. This is termed cross-breeding and enables you to fix (after much hard work) different tail shapes on to different colours for example, or combine two sets of colours on to one fish. Here though it would be necessary to mate the first generation youngsters back to the parents and then cross the half brothers and sisters in an effort to fix the strain. For no strain is established until it breeds true.

Actually you can never get a 100% true breeding strain because of complicated genetic factors, and while the vast majority of each brood of any established strain will look like the parents, one or two may turn out to be throwbacks to several generations before, or complete mutants or 'sports' which are completely different from anything else. It is, however, from such 'sports' that many of the fancy fin and tail shapes were eventually established.

Cross breeding can also apply to what are known as inter-specific crosses, which are fish produced by the deliberate or accidental mating of two different species.

The species have to be closely related for this to happen and examples of it in recent years have produced many of the fancy swordtails and platies. These species of the *Xiphophorus* genus will cross-breed reasonably easily enabling such things as Hi-Fin Platies to be developed from Hi-Fin Swordtails and Wagtail Swordtails from Wagtail Platies.

They will not cross-breed, however, in the community tank if there are mates of their own species present. Such matings have to be deliberately arranged by only providing the mates for the cross in the same tank and even then there is no guarantee that it will take place. There are certainly plenty of misconceptions about livebearer breeding!

Inter-generic crosses, which are matings between species of different genera (i.e. a platy (*Xiphophorus*) and a guppy (*Poecilia*) are almost genetically impossible and would in any event produce infertile offspring.

It seems something of a pity that experimental breeding of livebearers has rather gone out of fashion, especially in this country, at the moment with those who do take it up being dubbed the 'muck-it-about brigade' by the people who look on themselves as purists. But one has to realise that if no-one had taken the trouble to do a little experimentation with Guppies, Swordtails and Platies we would still have the wild, relatively drab, examples of these fish swimming around in our tanks and livebearers would not be as popular as they are.

This article has dealt mainly with the breeding of the commoner livebearers because that is where the beginner should start before moving on to the more difficult or

rarer species. I have deliberately refrained from mentioning mollies because I do not consider these to be beginners' fish. They need rather more salt in their tanks than the platies, guppies and swordtails and, especially with the sailfin species, need a considerable amount of space and patience to produce good fish. The best males take two years to mature and reach full size of over four inches. In fact, the best ones are raised in outdoor pools which is not feasible in this country unless we have a very exceptional summer. They can be bred and raised in largish tanks, but usually the best one can achieve is males about three inches in length.

Even getting swordtails up to their full body size of three and a half inches before the sword is fully formed usually takes some doing.

When you start getting into the realm of the 'Any other variety' livebearers things can get even more complicated.

Mosquito Fish (*Heterandria formosa*), that diminutive livebearer from South Carolina and Florida, for example, does not produce her brood all at once but drops two or three fry every days or so for about a fortnight.

Goodeid species such as *Ameca splendens* and *Xenotoca eiseni* require a separate fertilisation for each brood and the males have only a slightly modified anal fin instead of a true gonopodium. They have small broods of large fry and each one is born with an 'umbilical cord' as it has been nourished directly by the mother fish.

Even the *Limia* species which, in actual fact, do breed very easily take a long time to mature and some of them change quite spectacularly while doing so. The Cuban *Limia* gets an enlarged dorsal fin which is covered with black and white spots and gets a yellowish throat over the black-spotted grey body; the Hump-Back *Limia* changes body shape as his name suggests; but all this can take up to a year to happen.

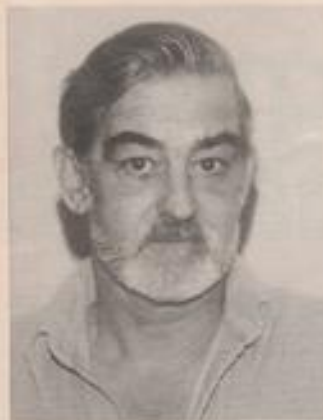
The four-eyed fishes, *Anableps* species, need shallow, salty, muddy water to breed in and, in addition to growing to one foot long, have genital organs which are either right or left handed. (That is to say that a male whose gonopodium swings only to the right must mate with a female whose genital opening is on the left).

The Pike Livebearer (*Belonesox belizanus*) is a very vicious fish which eats only live food, preferably other fishes, and as the females are almost twice as big as the males they have been known to make a meal out of their mates.

Asian Halfbeaks, long, slim, surface swimming fish, have an elongated lower jaw and only feed at the surface. They breed in very shallow water and the young are quite difficult to raise successfully.

And these are just a few of the 160-odd species of livebearer available.

If you do decide to breed livebearers the variety is available to suit everyone from the rawest novice to the most accomplished expert, and the satisfaction in seeing those fry that you have helped bring into the world grow and mature and breed themselves is reward enough for any fishkeeper.



Coldwater Jottings

by Frank W. Orme

AT THIS time of the year many newcomers are attracted to our hobby; eagerly they rush to a pet shop to purchase fish, either for an aquarium or a pond. Alas, all too often the initial joy ends in tragedy as death begins to take its toll of the once lively fish. Inevitably many will forget fishkeeping but a lot of heart-ache and hard-earned cash could have been saved if the beginner had made less haste and first learnt what to look for in a fish to ensure, as far as can be ensured, that the fish is sound and healthy.

I would suggest that no fish, no matter how attractive it might be, should be considered if it occupies a tank that contains dead or obviously sick specimens. To buy such a fish is inviting trouble. Healthy fish have bright eyes and an alert appearance. The fins are held proudly extended; folded fins usually being a sign that all is not well; the body has a clean mucus-free, well-fed appearance.

Avoid fish that are sulking, have torn fins or a whitish bloom, spots, or any other blemish on any part of the anatomy. Any fish that is thin and weak-looking or has difficulty in swimming should also be left alone, as should those which make violent jerking movements and scrape themselves on the tank bottom or any other firm object that is in the aquarium, the chances are that they are carrying some form of parasite.

Caution should not end there. Having decided that the selected seem to be reasonably healthy and having made the purchase, the fish should be floated, in its container, in the water of its new home until the temperatures of the waters have equalised, after which they can be allowed to swim free. If other fish are kept it is essential that the newcomer be kept separate from them for at least two weeks. During this quarantine period any latent disease should have time to manifest itself, and appropriate remedial action taken.

Careful observation of these common-sense precautions should result in fewer disappointments. If sickness does

become evident try to obtain the advice, or help, of an experienced fishkeeper before attempting a cure. A great many fish die through being submitted to too heavy a dose of chemicals, often in the mistaken belief that a double dose of medicine will bring about a quicker and more certain cure. It may be that, to the novice, a fish appears to be ailing when, in fact, it is not—and it is not necessary to apply any treatment other than, perhaps, a change of water.

If possible the safest course would probably be to obtain the fish from an experienced and reliable breeder whose stock, for obvious reasons, is usually maintained in the best of clean conditions in order to guard against any health problems. There is, of course, an added bonus in that any advice, which is offered, is likely to be based upon well-tryed and proved experience—not "hot-air" in order to make a sale!

Theft

From time to time I hear of the nefarious attentions which some fishkeepers receive from uninvited rogues. Last autumn, in particular, an increased number of reports reached me, of thefts of koi and goldfish from outdoor ponds. These crimes appeared, in many cases to be well organised and executed with some skill; nor were they restricted to one section of the hobby, for both amateur and professional suffered losses of stock. For this reason many hobbyists have become reluctant to advertise the fact that they are fishkeepers for they feel that if their whereabouts became known to these characters it could invite a visit from them.

In the main, the thefts appeared to have been committed by people who seemed to know how to remove even the largest fish without creating any noise, or other disturbance, which would attract attention to them. They also

seemed to be able to recognise the quality of the fish for, in most instances, only the better specimens were taken, whilst the inferior types were left alone. Fish were caught, presumably placed into containers or plastic bags—with sufficient water, carried to a vehicle of some sort and driven away. Such an operation would take some time to complete, but not once was the owner alerted to what was going on. It is almost too incredible to be believed—even more incredible is the fact that some of these villains had the audacity to repeat their thefts at some professional establishments and still not get caught.

Who buys them?

Who are these characters—are they rogue fishkeepers or dealers? What happens to the stolen fishes—do they find a home in the thief's own pond, or are they sold? If they are sold—who buys them? Surely, no sensible hobbyist or honest dealer would be foolish enough to consider purchasing without first querying where they had come from, or seeking proof of ownership? The offer of high quality, adult fish should be enough to rouse suspicion, under normal circumstances, for such fish are seldom offered for sale by the average hobbyist.

If any reader is approached with an offer of any fish, under circumstances which appear suspicious—such as the vendor being unwilling to allow an inspection of the fish, prior to making the sale, in their home environment—I suggest that the offer be refused. If possible obtain the name and address of the would-be seller, then give the information to the police—together with your suspicions. Only by making sure that the market for stolen fish is firmly closed are these thefts likely to be reduced—if not stopped completely. If the market is not closed, it may be that you will one day suffer from the attention of thieves.

Treatments

Recently I have come across a number of unusual treatments for various ailments of fish, some being from yesteryear which, perhaps, readers may also be interested in.

The most modern involves the use of electricity; this has been used against fish-lice, flukes, and velvet disease with a satisfactory result. The fish-lice were killed in slightly over one hour, with no ill effects apparent to the fish. This involved connecting six 1½ volt batteries in series to produce nine volts. Negative and positive leads, with the last two inches of each bared, were led into the tank water allowing the current to pass from one end of the tank to the other. After the treatment the water should be changed, because of the danger of a possible build up of copper poison—which could be lethal to the fish.

How about a cure for fungus—or better still a preventative? A 1914 issue of a Birmingham newspaper contained the following, written by a Mr. J. L. Norton: "The remarks under Nature Notes regarding fungus and goldfish are interesting, but I note that your correspondent

has omitted the only known and sure-cure for this troublesome disease, which is most contagious, almost acquiring the nature of an epidemic if not quickly attended to when it first makes its appearance. The disease is presumably due to insufficient aeration or oxygenising of the water and the remains of food or decaying vegetable matter. Whilst permanganate of potash tends to obviate it, neither this nor salt is a sure preventative or cure.

"When the disease is of some standing and the fins are largely eaten away, and leprosy holes appear in the body of the fish, it is sometimes possible to cure by cleaning the sores with pieces of wadding dipped in strong brine and gently wiping the fish over from gills to the tail, being careful not to permit the strong brine to get underneath the gills and also taking particular care to avoid the sensory-line; that is the curved line of dots appearing about halfway down the fish and extending from the gills to the tail fin. When this is touched it causes the fish extreme pain.

"After cleansing, make a solution of sulphate of copper (ordinary blue stone) just sufficient to make the water a bright coloured blue, and immerse the body of the fish into this, stroking or smoothing over the body with the fingers, taking the utmost care to avoid any of the solution creeping under the gills. It is a somewhat hazardous performance and few fish other than carp species or the tench can withstand it, as it removes the mucus; that is, the slimy stuff with which the fish is covered.

Sulphate of copper

"For a preventative of the disease, an extremely weak solution of sulphate of copper put into the tank, one part to six million, is unfailing. A piece of blue stone the size of a small hazelnut in an ordinary 8 oz. bottle is quite strong enough, and five spots of this stock solution in 50 gallons of water is quite sufficient and even this is almost too strong when the fish are not insured to it, and it is better to commence with a smaller amount. I have usually put three spots into a tank 5 ft. long x 2 ft. wide x 15 in. deep. Previous to its use, I lost hundreds of fish, but for the last ten years, during which time I have been using it regularly I have not been troubled at all."

Another preventative, which I saw mentioned, was lump sulphur. Although no directive was given, it seemed that lump sulphur was placed into both tanks and ponds and this effectively prevented fungus attacking the fish.

Coming forward to the very early 1950s, there was some mention in the aquatic press concerning experiments in the use of paraffin. It must have taken courage to plunge a pet fish into this oil for the first time, no matter how sorely afflicted the fish might have been. Nevertheless, some aquarists took the risk, and reported their findings.

Mr. S. J. Freeman recommended immersion for only a few seconds as a cure for flukes. He later demonstrated his treatment at a Goldfish Society of Great Britain meeting. A paraffin bath of short duration was also found, by New Zealand aquarists, to be a safe treatment for fungus.

Continued on page 51

Capoeta tetrazona tetrazona

by Ruda Zukal

A TANK GENEROUSLY planted with several varieties of Cryptocorynes and inhabited by a shoal of Sumatran barbs makes for a very attractive display. Many aquarists have been suitably impressed on first seeing these fish displayed at an exhibition or by a well-known breeder. So, I think it fair to assume that they can be included amongst the breeds most popular with aquarists. This is hardly surprising when one considers further that they attain a maximum length of 5 cm, are docile, easy to keep if given a suitable environment, and are omnivorous. These barbs were first imported in 1933 from their natural habitat in Thailand, Sumatra, Borneo and Malaysia. Their need for warmth must be catered for; if the temperature falls below 20°C, the fish lose their splendid coloration, confine themselves lethargically to a corner of the tank and, if the temperature does not quickly rise again, finally perish. Therefore, a temperature of at least 22°C should be maintained. If, however, the fish adopt a position in the water in which the head points downwards, the aquarist should not be concerned. Their health is in fact very good, for this is the characteristic posture of fish which are in condition. The water should not be hard; it should be well aerated and, if possible, crystal clear. A partial change of water at regular intervals is good for the fish. These barbs are susceptible to infection, can quickly contract inflammation of the gills and die. Consequently, it is advisable to carefully restrict the amount of food introduced, to what the fish can dispose of within ten minutes. The addition of salt to the water has been found a useful measure—one spoonful of salt per 50 litres of water. In a community tank with other non-aggressive barbs and related species, Sumatran barbs are playful, with the males engaging in harmless mock-attacks. However, if fish with long fins—such as angel-fish—are in the tank, then they will attack the trailing fins.

Generally, these barbs offer no particular difficulties with regard to breeding. They certainly can not be called problem fish in this respect. In a 15-20 litre tank, with water the hardness of which is medium to soft, an arrangement of delicate water plants and a temperature of 26°C, the fish soon come into breeding condition. Personally, having no soft water available, I used tap water to which some distilled water was added. The acidity was increased by a light addition of Torumin. Ideally the female fish should be a year old. The male can be older. If the two sexes are kept apart for a few days before the intended spawning, the urge to breed is all the stronger when they are brought together again. The male is placed in the breeding tank first,



The male, on the left, is slimmer in the body.

with the female joining him on the following day. After a rather violent bout of chasing, courtship and display, spawning usually takes place in the same morning. This lasts about three hours and up to 500 eggs are produced. After the breeding action has ended, the parents must be removed, the water tinged with Tripallavin and light aeration introduced. The fry hatch after 24-36 hours and are free swimming on the following day. They tend to keep themselves near the bottom of the tank and must be carefully but generously fed. After about eight months the young fish receive their 'suit of clothing'—in other words the dark vertical bands. Spawning can be repeated several times in the same year.



Albino variety of *C. tetrazona*



C. tetrazona showing normal coloration

Popular Tropicals —

some hints on basic care for the beginner



Angel Fish

By John Loader

THE FOLLOWING notes are my findings on commonly kept tropical fishes. Readers may have made completely different observations to mine; I don't doubt them.

Not all pairs of tropicals perform in the same way especially under different circumstances. As I believe water conditions and feeding to be the key to successful fish-keeping and breeding let me state my methods here.

Tap water as supplied here is 5° D.H. total hardness and pH 7.0. It is left to stand in open containers (buckets) for at least forty-eight hours before use. This is to release deadly chlorine gas from the water. Because I live in the tropics my tank temperatures average 27° C (80° F).

New arrivals are quarantined in Methylene Blue (2 drops 5% per gallon) for two weeks and their water is gradually mixed with local water until they are acclimatised.

If possible live foods are fed at least twice a week. Fry are fed live brine shrimp three times a day. These are hatched in six open trays used in rotation.

Angels (*Pterophyllum* spp.)

These were harder than I expected and peaceful with fishes their own size. They liked live foods, baby guppies,

crushed snails and frequent partial water changes. Mine were prolific breeders; a mated pair spawned every eight days for a year. The fry tank had to be kept very clean by siphoning. My angels ate large flake foods, relished minced beef and became finger-tame. They appeared unaffected by white spot.



Pterophyllum spp. (Angel fish marbled variety)



Kissing Gourami (Green variety) *Helostoma temminckii*

Cardinal Tetras (*Cheirodon axelrodi*)

A beautiful and hardy show fish. A school of six or more makes an attractive show piece. These replace neon (*Hyphessobrycon innesi*) in my tanks.

Catfish (*Corydoras aeneus* and *C. paleatus*)

Very hardy and long lived. Peaceful with any sized fishes. Useful in any tank especially a fry tank. Mine showed no inclination to breed until I fed them *tubifex* worms. They were not prolific and bred infrequently with many eggs fungus.

Dwarf Gourami (*Colisa labiosa*)

Very pretty and peaceful but not long lived. Spawn easily but difficult to raise many fry. My record in ten spawnings is forty-five maximum. Prone to dropsy and velvet (*odinium*) parasite.

Kissing Gourami (*Helostoma temminckii*)

Very pale coloured, peaceful but very greedy eaters. They enjoy green algae on tank sides. Mine never spawned and died when I went on holiday, perhaps through lack of food. At ten centimetres length (4 in.) I was unable to sex them.

Leeri Gourami



Moonlight Gourami (*Trichogaster microlepis*)

My adults seem very hardy. They eat duckweed and floating dried food. The male has an indentation above the head. They bred in my pond but I only raised seven fry indoors.

Pearl or lace Gourami (*Trichogaster leeri*)

Very peaceful fishes. Mine breed easily and prolifically. Probably the second easiest gourami to breed and raise. The male has a longer and more pointed dorsal and goes orange around the pectoral fins when in fine condition. My specimens appear quite hardy.

Three Spot Gouramis (*Trichogaster trichopterus*)

Very hardy but large males extremely aggressive. They breed easily and prolifically. Probably the easiest egg-layer for beginners. The fry are easily raised even on fine dried foods. The males have longer and more pointed dorsals. The golden and "Cosby" or mosaic gouramis are varieties of the above and will interbreed.

Guppies (*Poecilia reticulata*)

Very hardy, pretty and peaceful. Not long lived. Prolific but mine did not breed true. Unwanted fry useful when no live food available. My specimens did not eat snails unless crushed.

Mollies (black) (*Poecilia latipinna*)

Kept in sunlight with plenty of algae I would rate mollies as quite hardy and peaceful. Large females are fairly prolific. When left alone in a tank I noticed they had two broods at 31 day intervals without the need for refertilisation. They are greedy eaters and very lively. Fry grow quickly if they can be fed up to six times a day. No salt appeared necessary in the water. The parents did not eat their fry. They enjoyed freeze-dried *tubifex* but did not touch chopped lettuce leaves or duckweed in my tanks.

Platies (*Xiphophorus maculatus*)

My first and still my favourite fishes. When at school I saved my lunch money for three days to buy a female red platy. It produced twenty-five fry the following day (probably due to the change of water) much to the amazement of my biology master. They are very hardy, peaceful and prolific. They make a beautiful show with black mollies and green plants of any kind (even plastic). Platies rush for crushed snails.

Red-tailed black sharks (*Labeo bicolor*)

Very pretty and peaceful with any other fishes except its own kind. Extremely hardy and grow quickly eating mostly algae and dried foods. A welcome addition to any tank.



Red Swordtail and Black Mollie

Swordtails (*Xiphophorus helleri*)

Very hardy and pretty but large males extremely aggressive. Tanks must be covered or the best specimens will jump out. Quite prolific but parents eat fry.

White Cloud Mountain Minnows (*Tanichthys albonubes*)

A firm favourite of mine. They are hardy, peaceful and prolific, when mature they will breed in any container. Month old fry seem to glow like neons. The fry are very prone to the velvet (*oodinium*) parasite. All new stock must be quarantined in methylene blue as above.

Zebras (*Brachydanio rerio*)

A very beautiful shoaling fish but mine appeared extremely sensitive to water conditions. Do not change more than one third of the water at a time. They are hardy and prolific in old water. Fry are difficult to raise in small tanks. Mine seemed immune to white spot.

White Cloud Mountain Minnows (*Tanichthys*)



Coldwater Jottings—continued from page 47

White spot

A Mr. C. H. W. Edmonds, of London, wrote that he had successfully cured various tropical fishes of white spot, by giving them a bath lasting for ten seconds, in pre-warmed paraffin oil. However, he warned that surplus oil from the net left a film on the tank-water surface, which if not removed caused the fish to suffocate. The oil was easily removed by drawing sheets of newspaper across the top of the water. Mr. A. J. Wright, also of London, reported that he had followed the recommendation of Mr. Edmonds to treat Tiger Barbs which were in an advanced stage of tail-rot. Within one month of the treatment all were sporting new, unblemished tails. The paraffin oil had caused no side-effects nor had any effect upon the rate of growth. In fact, it seemed that each of these correspondents felt that, if reasonable care was taken, the particular treatments which they recommended were quite safe to use.

Sexual maturity

A question that is often asked, in respect of goldfish, is how old they must be before they can be used for breeding. The answer is that the age has little bearing upon the fish's ability to breed, some will reach sexual maturity at quite an early age. More important is the size of the fish, for a sexually ripe, undersized specimen is not the type to use in a breeding programme—mostly these fish tend to be males. However, if the fish is well grown and has a body length of not less than, say, two inches, there is no reason why it should not be used for breeding purposes even if it is only twelve months old.

As yearling males are usually very vigorous, the ideal would be to use these with a three year old female. This could yield a higher percentage of fertile eggs than might be the case if an older, less vigorous male were used. Generally, the size of the female governs the quantity of ova produced, therefore a larger, mature three year old is likely to be more suitable, for spawning, than her year old, immature sister. Nevertheless, there is no reason why the younger female should not be used if an older fish is not available.

The main drawback to using young fish is that their particular features may not be fully developed, in which case it will be difficult to truly assess their potential—unless their parentage is known. It is always a gamble, when breeding the fancy goldfish varieties, as to what the quality of the young will be, invariably the number of decent progeny is far outweighed by the number of inferior specimens. It is common-sense, therefore, to try to shorten the odds by choosing, as parents, those fish which have the best, and most developed, of the desired features.

Whilst some fishkeepers do not object to cross-bred goldfish, I feel that the person who intentionally cross-breeds the different varieties does the hobby a great disservice. It immediately undoes all the work of past breeders, who have striven to maintain, and improve the fancy goldfish varieties. Why ruin the variety?



Julidochromis ornatus

Breeding *Julidochromis* *ornatus* –

a
Lake Tanganyika
cave spawner

by Jørgen Hansen

ONE OF THE most beautiful of Lake Tanganyika's cichlids is perhaps *Julidochromis ornatus* which, although described by Boulenger in 1898, was first introduced to Europe in the middle of the nineteen sixties. At first it was in very limited supply and accordingly expensive and was thus something of a collector's item. Gradually, however, as more and more began to breed the fish, it became correspondingly common.

Julidochromis ornatus is endemic to Lake Tanganyika which is the largest of the East African Rift Valley lakes, and the second deepest lake in the world. The water's transparency is from 3.3 to 22 metres, its surface temperature is 27°C, and its pH value from 8.6-9.2. *Julidochromis ornatus* keeps to rocky areas, consisting of a large number of rocks piled on top of one another and forming innumerable dark caves and tunnels. The rock surfaces are overgrown with a thick layer of algae which, together with its content of crustacea and other small organisms (*Aufwuchs* = algae + contents), form the main nutritive element for the fish inhabiting these areas. *J. ornatus* is generally found at a depth of from 1-5 metres.

I have at the moment all five species of *Julidochromis* and regard *J. ornatus* to be the most aggressive. It is very reminiscent in colour patterning of the female *Pseudotropheus auratus* from Lake Malawi, but there the likeness ends. The body form of the *Julidochromis* species is cylindrical and cigar-formed. The basic colouring is yellow with three dark-brown to black stripes running along the upper part of the body. The uppermost of these runs along the lower part of the dorsal fin.

The dorsal fin is edged by an orange band, within which runs a blue band of the same breadth (1 mm.). The anal fin is edged with dark-brown. The caudal fin is rounded and yellow, and edged by a brown band within which runs a blue band. At the base of the caudal fin is a large round dark brown or black spot. The first rays

of the ventral fins are prolonged, and reach the beginning of the anal fin. The nocturnal colouring is dark-brown with dark stripes.

Technical data:

- (1) Two incomplete lateral lines.
- (2) Teeth conical, the outermost very large.
- (3) 4-6 canines in each jaw.
- (4) Body depth goes 4-4½ times into total length.
- (5) Head length goes 3½-3¾ times into total length.
- (6) Head as double as long as broad and upper profile convex.
- (7) Snout length 1½ times eye length.
- (8) Eye's diameter goes 4½-5 times into head length and 1½ times into interorbital width (distance between eyes).
- (9) Pectoral fin length about ½ times head length.

	Spiny rays	Soft rays
Dorsal fin	xxii-xxiv	5
Anal fin	viii-ix	4-6

Scales in longitudinal series: 32-35 in.

I have kept *J. ornatus* on several occasions and the course of events in each case is typical of the difficulties encountered with this fish. I began by purchasing two specimens, which I placed in an 80 litre tank together with four *Lamprologus saoyi*. At each end of the oblong tank was built a couple of caves, which was by no means sufficient, as I discovered a couple of weeks later, when only one fish, a fine, large specimen of *J. ornatus*, remained. The other fish had either leapt out of the tank or had suffered a fatal defeat on the battlefield. On the second occasion a similar tragedy occurred although I began with four fish.

Finally I fixed up an 150-litre tank with a whole series of caves and a 5-cm. layer of hornwort (*Ceratophyllum demersum*) floating on the surface, so that weak and perse-

cuted fish did not lack shelter. This time I did not buy the largest fish in the shop, but purchased five young fish of about 4 cm. in length. At first nothing really happened apart from a few minor skirmishes; I was, in fact, quite taken aback by the fact that no deaths occurred. After the course of three months, however, it became clear that the two largest of the fish had paired off: they had taken over the caves and had driven the three remaining *ornatus* into one of the far corners of the tank where, for the most, they were obliged to conceal themselves in the wilderness of hornwort. Only at feeding-time did the three outlaws dare to venture from their hide-out in order to snatch a bite of food which the two sovereigns of the tank regarded as their personal property, whether they could manage to consume it or not.

I noted the following course of events: 11.4.77. The pair defends its chosen cave fanatically and one of them keeps there constantly. By means of a torch, I discovered about twenty pale yellowish eggs about 2 mm. in diameter stuck to the cave roof. The breeding-tube of one of the pair is in evidence, and I reckon that this is the female. 13.4.77. There is no trace of eggs or young but the parents still guard the cave and its environs avidly. 14—19.4.77. Still no trace of the young but the adult fish still behave aggressively towards the others. 20.4.77. By the light of the torch, I perceived a tiny movement near the cave roof, and when looking again saw three fry 5 mm. in length and brownish, swimming belly upwards. My mistake had been to search near the bottom of the cave instead of just beneath the roof.

During the following month I fed with small *Daphnia* and *Cyclops* and trout fodder. The fry did not leave the cave, and I never counted more than three at a time. 24.5.77. The pair is again very aggressive, and on shining into the cave I discovered about 20 eggs in the same place as before. The fry from the first brood are still swimming around in the cave. 27.5.77. All the eggs gone and no trace of the young. 3.6.77. Two fry swimming freely. The three fry from the first brood are now 15 mm. in length. 16.6.77. Suddenly ten fry 20 mm. in length are to be seen swimming happily in front of the cave. Where they have been hidden is anybody's guess. 7.7.77. Brood Number three was produced while I was on holiday, for now newly-hatched fry are to be seen swimming around in the cave, while brood number two have developed their three longitudinal stripes and hover just outside the cave. The first brood have been banished from home but are tolerated in its vicinity.

The family idyll continues until the young are sexually mature, at which point they are chased away by the parents. Fish 5-6 cm. in size produce broods of from 10-30, while larger fish produce a larger number. The largest number of young I have heard of with *J. ornatus* is 118.

Julidochromis ornatus is a beautiful although quarrelsome dwarf cichlid which, when provided with a suitable environment, neither touches plants nor digs excessively, and cares for its young in an exemplary manner.

Pisciculture or Ichthyology—

continued from page 39

The hobby is only two decades away from the year 2000, where could it go from here?

In this age of highrise flats, more leisure time and parks in which man's best friend can no longer roam, a clean odourless and encapsulated aquarium world could perhaps save the day. We are informed by the enlightening scientists that a huge potential in protein swims beneath the Earth's waters and that the next few generations could be filling hungry stomachs with farmed trout or some deep sea 'head on a string' as yet undescribed to science.

Equipment

Equipment should become time saving and automated—the silicone chip or some molecule-splitting energy source may enable aquariums to simulate the ecology of fishes. Water movement, day/night light, temperature cycles and random food releases—all simple changes which could soon become reality.

When all this happens, perhaps we will be further away from the hobby (or could that be nostalgia?), from the days of the neon tetras being too expensive to buy (other than individually) and aquariums which only required a top-up to compensate for water evaporation.

The hobby

Hopefully, for as long as fish are the source of infinite questions, no amount of technology should spoil the hobby of fish keeping. I will quote some thought provoking words written recently by an American aquarist. He suggested aquarists often lose their way once the art of fish keeping becomes second nature. He asked, "when do you observe your fish?" If the answer was at feeding time, cleaning filters or completing water changes, then you could have strayed away from the real ideas of the hobby.

The hours spent by thousands in front of their first aquarium marvelling at the colours, shapes and behaviour of the fish inside is the basic point of keeping fish; a five minute glance at the fish tank as part of a chore is the furthest point. The joy shown by the newcomer as he or she views the new found world of fish is simple and uncluttered and surely is the hobby and should be for many many years to come.

Buyer's Guide

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Why didn't somebody tell me? (Part 2)

by Jim Finn

THERE IS NOTHING more off-putting to a novice aquarist than having his fish die on him. Some persevere and eventually get things right by trial and error, but probably as many give up completely when that first tank becomes decimated by disease.

But in this case he cannot be held entirely to blame. If some shops payed a little more concern to selling *healthy* fish as opposed to just selling fish, they would have a lot more customers in the long run.

I remember the first time I saw sailfin mollies in one of my local tropical fish shops when I lived in the Manchester area. The males looked spectacular and I was quite taken with them. Unfortunately I had never kept them before so had no real idea of their peculiarities or the conditions they preferred. A couple of fish in the tank were pretty active but many of them were simply staying in midwater undulating from side to side. This should have warned me but it was not something I had come across before.

What was that swaying motion I asked the man behind the counter?

"Oh that," he replied glibly. "When there are a lot of males in the tank one or two become dominant and the rest show their submission that way."

"But some of the females are doing it too," I pointed out.

"It happens with them as well," he added without looking up. "They'd be all right if there was just a pair in the tank."

Now to my very green mind it seemed a reasonable explanation and after all you do expect your local dealer to know about these things.

So, not being as selective about choosing my fish as I am these days, I let him catch me a pair, parted with my money and took my fish home in their polythene bag.

I did know that the fish should be floated in the tank in the bag before they were released into the aquarium, because it said so in one of the books I had read, to equalise the temperatures or something. But the fish didn't look too happy so I thought they would be better off in their new quarters without the other mollies dominating them.

However, it did not seem to make much difference. In fact they looked even more unhappy, with clamped fins and even more swaying from side to side.

"They'll settle down," I thought, "it's just that the surroundings are a little strange."

The following day, however, they were covered in little white spots.

I dashed round to the pet shop and told the owner who said: "That's White-Spot. You'll need this," and promptly sold me a bottle of white spot cure.

I followed the directions, dosed the tank and raised the temperature, but it didn't seem to do much good and in a week both mollies were dead and most of the other fish had a liberal spotting as well. I repeated the dose and eventually cured most of the remaining fish.

When I went back to the shop the man said he thought there must have been something wrong with my water in the first place.

"Why?" I asked, "all my other fish were all right."

"Did you have any salt in the water?" he said reaching for a packet off the shelf.

"No," I replied. "should I have done?"



"Of course," he said. "All mollies like salt in the water."

"But you didn't tell me that when I bought them," I protested.

"You didn't ask," he said and shrugged his shoulders. "Now, do you want this salt and another pair of fish or not?"

Needless to say I did not buy another pair of fish from that shop then or at any other time. I found another shop where the owner was more helpful. The first time I bought fish off him he asked me what size my tank was; what other fish were in it already; what the temperature was; did I have any salt in the tank and did I know how big the fish I was buying would grow to?

He seemed to have a prodigious memory for the fish that just about every customer owned, and if you were young, or obviously new to the hobby as I was, he made sure that he didn't sell you a disaster in a polythene bag.

I got to know him quite well and recounted my earlier experience to him. He nodded sagely and explained that if a molly was 'shimmying' it was at best unhappy with the water conditions, and at worst very unwell. They did like salt in the tank and the temperature in the carrying bag and the tank should be carefully and slowly equalised as the fish were very prone to chilling. And, he added, it was also better to open the bag after ten or fifteen minutes and let some of the aquarium water mix with the water in the bag, then let the temperatures equalise a bit more before tipping the bag on its side to let the fish swim out.

It was an expensive lesson I had learned but I now knew that if any fish looked unhappy in a dealer's tank it was not worth taking a chance on it because it could be in the first stages of a disease that would infect all my other fish.

It was many years before I could afford even an extra tank to act as a quarantine aquarium, and even then more often than not it ended up being used for breeding or bringing on batches of young fish, but I found that sticking to the rule of always being selective and buying healthy looking fish from shops where the owner or assistants were helpful, paid off, and I never suffered another disaster.

Beginning with Tropicals (3)

by Roy Pinks

I HAVE ALREADY advised most strongly that before you spend a penny on stock or accommodation, you should use your eyes and ears. Read all the books you can, listen to those whose aquaria you admire, and make an extended tour of all the shops which sell fish in your area. You will need to take a few decisions about the size and type of tank you are to buy, and you should also consider carefully whether you think you will be satisfied with just the one.

Some folk are quite happy with a single tank, but if you have obsessional tendencies, and many of us have, spare some thought for the way in which your expansion might lie. The older books will tempt you towards fish houses, but the soaring costs of heating today are hitting the enthusiasts very badly, and unless you have a lot of money rattling around in your pocket, it is perhaps best to confine likely expansion to a spare area in the home which, even if it may not benefit directly from central heating, will be heatable at minimum cost. But before you get seriously involved with the hardware I suggest that you work out exactly what types of fish you want to keep. I think that the one word I would like to strike from the fishkeeping dictionary is "community." It is a really treacherous and misleading word, largely misused and mostly meaningless because it is taken out of context. If you disagree, I suggest a visit to the type of retailer who tries to help his customers by including cultural notes on the tanks.

Community fish

Write down the names of all the fish described there as "community" fish and ask him if he will kindly set up one huge tank, to include representatives of all the names on your list. He will probably thrust a free packet of fish

food into your hand and hurriedly point you towards the door; certain of the species on your list, however, if they were capable of thinking and approving of human actions, would be highly delighted, for they would thrive and prosper at the expense of the lesser brethren. How, then, can they all be community-compatible?

The short answer is that they are not and cannot be. They all belong to different families and come from different parts of the world and have different habits. Some lay eggs and some have their young alive. Others lay eggs on plants and yet there are those who brood their young in their mouths. Some like seclusion and some are bold, whilst others are largely man-made, contrasting with those freshly caught from the wild. The most that one can say is that many species will live peacefully with many others; within this spectrum will come most of the most satisfactory occupants of the beginner's tank. The actual matchings, usually left to the purchaser, are successful more on account of beginners' luck than artifice, and I would suggest, therefore, that the beginner should work out for himself, well in advance of purchase, species-compatible matchings and leave the "community" concept to those with few brains and little imagination.

To be sure you can keep a platy and some guppies and some neons and some tiger barbs and some catfish and a small angel but you wonder what has gone wrong when you add the molly and it dies. You will usually get little inspiration from your dealer either, for he almost certainly has one "community" tank containing one of almost everything, which sets the nerves jarring. Apart from this he has his stock tanks, usually containing just one or two species. Both ends of the spectrum—the former is a hotch-potch and the latter are not adventurous enough. You really need to go to some of the shows, preferably the national ones, to see just how the *cognoscenti* create the most wonderful settings by using massed plants and just a few fish. The few fish are usually related but of totally contrasting appearance.

Selected species

The effects, sometimes of drama, often of rest and tranquillity, but always of interest capitalize on the individual characteristics of selected and considered species. To increase the impact you might add a few more of a single species, which you know would be well received by the existing inhabitants. With the usual alternative, the cluttered and ill-conceived "community" tank, something always seems to be missing, and the owner, in trying to make up for it, adds fish after fish, something "different" each time, which merely worsens the situation and often ends with disaster. A costly and unsatisfactory business which drives newcomers quickly away from the hobby.

How, then, should the beginner decide on his groups of fish if he is to reject the "community" label? Size is only a fairly good start, though it is useful to know whether you intend to keep large fish or little fish or medium sized ones. Or those which are all red, to match the furniture, or which are curiously shaped? Another line to follow is to keep

those species which are much of a size which prefer the same water conditions. You are on safer ground here. It all means studying the form books, however, and asking around, but at least you will have worked out a purchasing plan before you buy any fish.

There are several important advantages in doing this. Every time you add fish to an established collection you run the risk of introducing disease, notably White Spot. Whatever may be said about the ease of curing this common scourge, the chemicals which are applied often harm the survivors and they can adversely affect the plants. There may be financial reasons, too, for buying all your fish at one time. You can probably buy a quantity of young fish, to form a shoal, which will look very attractive; but in buying quantity you may qualify for useful discounts. Another aspect is that if you add to a tank you are nearly always putting smaller specimens with bigger ones. This can sometimes lead to trouble—if you have ever seen neon tetras fighting you will take this point—and the disparity in size is not always a welcome visual feature in a tank for show.

Fish behaviour

Consideration should also be given to how the fish dispose themselves. It is interesting to compare the fidgety nature of the guppy with the staid progression of the gourami, the dignity of the angel with the lightning swiftness of the zebra danio. To have twenty different sorts of progression going on in the one tank is something of which you will rapidly tire, and it is highly likely that the fish will suffer too if the extremes are too exaggerated.

A few thoughts ahead to the type of lighting you propose to install above your new tank will also help you to make the best of your purchases. The colour rendering fluorescent tubes accentuate certain tones, and it is as well to see what this means in the flesh, and your dealer will usually be pleased to demonstrate what possibilities exist. If you can contrive a combination of fluorescent and tungsten lighting, so much the better. There are some nice tank cabinets around, too, which enable the purchaser to incorporate multiple light fittings so that different types of fluorescent light can be switched on to suit the mood or the time of day. Some fish react particularly pleasingly to variable lighting and you can adjust your choice accordingly.

Little Monsters

Perhaps the saddest miscalculation of all is the purchase, in ignorance, of tiny young of some of the most monstrous and unsuitable of fish for your particular collection. The oscar and the tinfoil barb look quite marvellous in infancy, but anyone who adds them to an average home aquarium will soon regret the fact by having specimens on his hands which are embarrassments in themselves and difficult to dispose of. By contrast, adult small and medium sized fish are willingly exchanged by most dealers if they are in good condition, should their owner wish to reshape his collection with some other groups of compatible species.



John Hall, a noted Judge from Yorkshire, studies one of the exhibits in the coldwater class.

A Guide to Exhibiting Fishes

Part 3 - up to Show Standard

by

Barry Durham

THERE ARE THREE things that any fish needs if it is always to be at its best:

1. Plenty of space.
2. Clean conditions.
3. Top quality food.

If you are limited to the amount of tank space available, then you must be ruthless with yourself and limit the number of fish. For instance, if all you have available is a 24 in. x 12 in. x 12 in. community tank then ten smallish fish is about the maximum you can hope to raise to full size. They would all have room to grow and reach their full potential. If you stick to the rule of twelve to fifteen square inches of water surface per inch of fish when they are fully grown, and then add filtration and aeration as well, you won't be going very far wrong.

I prefer properly planted tanks as I think not only do they look better, but the fish seem more at home among the plants and rocks than in completely bare quarters. Try and keep a fairly substantial part of the tank clear, however, as you have to remember that throughout the show season your fish have to be caught pretty frequently. Planting round the back and sides of the tank still provides enough decoration and cover but allows plenty of free swimming and netting space.

Make sure you always carry out regular water changes. Fish always do best in mature water it is true, but it should be constantly diluted to prevent a build-up of excess waste matter. Removing about a fifth to a quarter of the water weekly when you are siphoning off the mulm and other detritus is probably the best method.

Replace this with water that has been standing for a couple of days to allow the chlorine to dissipate; clean rain water, or water from the tap that has been treated with dechlorinator.

Whether they are all in a community tank or in their own separate aquariums, all your fish should be fed as well as possible. There is no such thing as overfeeding your fish. You can "overfeed" your tank by putting too much food in it for the fish to eat, in which case the fish will eat until they have had enough and the remainder will be left to rot. If you stick to the old rule of "little and often" however, you can't go very far wrong.

I would recommend feeding at least four times a day—more often with fry. If you are feeding dried food put in one pinch and then watch the fish eat. It should be consumed within ten minutes. If there is food left resting on the bottom or floating on the surface after this time you are feeding too much and should reduce the

amount accordingly. If all the food is snapped up very quickly, increase the given amount slightly.

Live food is less of a problem as quite a bit of it will stay alive in the tank for relatively long periods to be picked up as between-meal snacks. Live food should be given as often as possible, and if you think it is expensive then there is always the good old garden worm to fall back on.

Chopped up fine, garden worms are excellent food for all fish and fed regularly on them your potential show fish will come on apace. It is best to leave them for a couple of days in moss before feeding them to your fish so that any soil in their bodies can be passed out of their systems. Earthworms are in fact the only "no risk" live food as, coming from the garden they have no way to pick up water-borne parasites and infections.

Tubifex worms are relished by nearly all fish but as they come from the dirty smelly mud of rivers near sewage outlets they must be thoroughly washed beforehand to remove any debris. They should also be left for a couple of days, preferably under running water, to get rid of any detritus in their systems before they are fed to the fish. If you can't leave them under running water put them in a large container and change the water several times a day, turning the tap on hard so that it loosens up the mass of worms and the jet frees any muck they may contain together with any dead ones. The live worms will settle quickly to the bottom and you can then pour off the dead worms and muck. Do this several times until the water is crystal clear.

White worms are quite a good food and have the advantage that they can be cultured indoors in a fairly small space throughout the winter when other forms of live food are scarce. It has been said that feeding fish exclusively on white worm can lead to fatty degeneration of the liver, but as I use them only as part of the fishes' diet I have seen no evidence of this.

Maggots are also thought to be fatty, but again I have no trouble in feeding them to my fish as part of their diet. They are easily obtainable from fishing tackle shops all year round and should be kept in a cool place (bottom shelf of the fridge is ideal if you can manage it). Large fish can take them whole, but they should be chopped for smaller ones.

Many aquarists throw their maggots away when they turn to "casters" or chrysalids, but after a very interesting lecture by Brian Walsh of Darwen Aquarist Society I now find that the chrysalis stage is probably more beneficial than the maggot itself as it contains a considerable amount of protein to enable the change to bluebottle to take place. They are easily fed to small fish by simply squeezing them so that the high protein fluid they contain can drip into the tank. Fry go wild for it, but don't feed too much at once as it does tend to cloud the water a little.

Daphnia, bloodworms and glassworms are all very expensive for the amount you get in one little polythene bag, and once again there is the chance that they might not be as clean as they could be and could bring parasites or infection in with them. I have seen leeches in bags of



This Clown Barb lived quite happily in my 4 foot community tank and picked up a 'Best in Show' award at Runcorn in 1979. Here it is pictured taking place in the Champion of Champions contest at the BAF, 1979.

daphnia for sale in several shops, and in tubs of *tubifex* worms for that matter as well.

If, during the summer, you have access to a pond where there is plenty of *daphnia*, and you can spare a tank filled with clean water to put them in, then by all means go and catch your own with a fine net. You can then keep an eye on them for unwanted guests for a couple of days before feeding them to your fish. You can also culture your own from a "starter" bag bought from a shop and there is an excellent article on this (and culturing other live foods) by Bob Purdy in the April 1978 edition of "The Aquarist and Pondkeeper."

Brine shrimp, when newly hatched, are a good source of food for fry and if you can get them to grow on a bit they make good food for adult fish as well.

A piece of lean raw meat is quite a good substitute for live food. Suspend it in the tank on a piece of cotton so the fish can pick at it. Or you can go a bit further and get hold of beef or lamb's heart and chop it very finely to feed to your fish. Put through a blender it comes out as a sort of meaty mush which can be taken by all fish from about four weeks old upwards. Beef heart is a bit better as it is not as fatty and so works out cheaper. Liver is another good food and I have even heard of aquarists who don't like to go to the trouble of "meat mashing," feed prepared meaty baby foods with some success.

There are also plenty of good quality dried foods on the market and if you pick a range which has a selection of "flavours" you can provide plenty of variety without even feeding live foods. A combination of both dried and live foods, however, will ensure that your fish have plenty of interest and diversity in their diet.

Don't think that because a type of flake food is marketed for a particular type of fish others will not like it. Vegetable food is relished by many fish and carnivore food, which is usually sold for cichlids, is also enjoyed because of its high meat content.

Colour foods do have their values and contain vital vitamins but I would never recommend their use exclusively

for long periods. They do have an effect on the colours of fishes but seem to work best on reds and blacks. Feed it selectively to the fishes who will benefit most from it, or feed it sparingly as part of an overall feeding programme.

So now you have some good fish that are approaching full size, they are clean and healthy and their colour is good. What makes a good fish a winner?

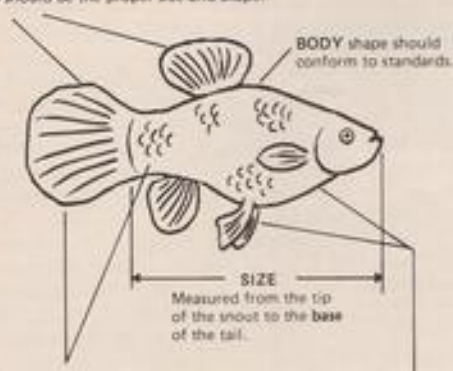
The best way is to try and judge it yourself using the "five twenties" system that the judges use. That is, they score marks out of twenty for the following five categories: Size, Body, Colour, Fins, Condition and Deportment.

Size.—The fish should be as near as possible to the "norm size" quoted for it under your local show rules. This size is measured from the tip of the snout to the base of tail. The length of tail is not included so it actually refers to body size. There is variation in the way of scoring; for instance, the Confederation of United Kingdom Aquarists (C.U.K.A.) give 15 points for a full size fish as they assume that somebody sometime will come up with one that is bigger than the norm. Fish over norm size score points up to a maximum of 20. Below norm size they are pointed proportionately less.

The Federation of British Aquatic Societies (F.B.A.S.) give a norm size fish the full 20 points and a curving graph determines points for sizes below this. The graph has been produced because the F.B.A.S. feel it is more difficult to grow a fish on from half size to full size so they award a one quarter grown fish three points; a half grown fish seven points and three quarters grown fish 13 points. There are therefore seven points available to the aquarist for the fish's last quarter of growth. A fish over norm size does not get any more points, but its size will be recorded and the possibility of revising the norm for that particular species looked into.

WHAT TO LOOK FOR WHEN CHOOSING A FISH FOR SHOWING

FINS should be the proper size and shape.



CONDITION AND DEPORTMENT

No split or frayed fins.
No missing scales or other blemishes.
No disease or parasites.
Should be alert and in its correct position in the water.

COLOUR

of both body and fins should be as bright as possible and as near standard if a particular variety it being shown.



The ambition of every aquarist who competes at shows must be to win the Champion of Champions as did this *Mylossoma argenteum*, owned by J. R. Alder of Hartlepool in 1978.

Body.—The fish should conform as nearly as possible to the ideal outline for that particular species. It should not be too fat or too thin; it should not show any spinal deformity nor should any part of it be out of proportion.

Colour.—The colour should be as bright as possible and as correct as possible for that particular species or variety. This is especially important when showing colour varieties of certain species. Where a fish is still in its wild colouration the colours should still be as well defined and as bold as possible, always taking into account the natural tone of the fish. Some species naturally have more subdued colours than others and of course there may also be colour differences between the sexes as well.

Fins.—These should conform to the proper shape for the species, be the proper size and have the correct number of rays. This also applies to the fancy fin varieties as well although here it is rather more difficult to determine as in many cases the fins are quite soft and flowing.

Condition and Deportment.—Condition covers the soundness of the fish's body and finnage and points will be lost for missing scales and marks on the body, split, torn, frayed or ragged fins. No disease or scars should be evident.

Deportment covers how the fish behaves in the show tank. It should be alert with all its fins erect. A fish which has its fins clamped up and just shimmies from side to side will not even get a second glance. It should also be in its correct position in the tank for its species e.g. catfish on the bottom; barbs in midwater; halfbeaks at the surface.

A fish which dashes about madly in the tank will also lose many points because this is obviously not its natural state. It also prevents the judge from getting a proper look at it.

Midwater fish hugging the bottom, dashing about madly, shimmying and frenzied action are due to the fish not being used to the show tank and this can be corrected by proper training which I will cover in a later article.

If you have a fish which looks good in all five categories in its own tank, it is time to think about preparing both the fish and yourself for your first show as an exhibitor.

Next: Preparing for the big day.



TROPICAL Queries

by Roy Pinks

Please could you tell me if it is possible to breed the talking catfish (*Amblydoras hancocki*) in the aquarium, and if it is possible, how would I go about it?

Amblydoras hancocki is a member of the family of Thorny Catfish, which come from South America. Although they are individually interesting in colour and structure, they tend to be most active at night and remain hidden for long periods during the daytime, so do be sure before you acquire them that you would not get bored with creatures which show themselves off so sparingly during the day. As they burrow around for food you would need to keep them in a tank furnished in such a way that this would not matter (ie very few plants but plenty of hiding places, and a deep and soft covering on the tank floor). Catfish favour hard alkaline conditions, and you should filter the water as it would otherwise get rather dirty. Feeding is not difficult, but some worms should be included in the diet.

Breeding is difficult, and not much is recorded, but it appears that this species builds a nest of leaves. You would first need a true pair, and the male is distinguished by brownish spots on the underside. As they grow to 6 in. or so the young would be quite large, and if you were lucky enough to hatch any, brine shrimp and microworm could be fed from the very start. I would select a large tank and keep it as secluded as possible, at temperature of 78°F or thereabouts, condition the fish well, and let them have the complete run of it.

I have a 12 cm. *Synodontis melanostictus* who can never be seen because it is always hiding. Could you please tell me how I can draw him out into the open and to be less nervous?

It is in a 3 foot x 15 in. x 12 in. tank with seven small Malavis, the largest being 9 cm., a 9 cm. Texas Cichlid and a 6 cm. *Cichlasoma severum*. Could it be that these fish are making it nervous?

The *Synodontis* species are nocturnal by nature, and it is by no means unusual for them to be almost completely out of evidence during the day. I cannot fault your tank companions at the sizes quoted—they should be quite all right as company.

It really is quite a job trying to make animals do things they don't really want to do, and you may simply have to

live with the fact that this group of fish just reach their peak when we are tucked up in bed. I do recall seeing an enormous tank some years ago in which the owner, who was very fond of this type of fish, had created a very dark aquascape. There was a lot of cork bark at the rear of the tank, there were huge rocks and large dark leaved plants, all of which played down the lighting to sombre tones. While the *Synodontis* were not exactly at the front of the tank all day, at least you saw something of them for much of the time, and I feel you might get some improvement by experimenting with decor and lighting, because if it is too light at present, you may find it is this rather than the other fish which is putting off this specimen you have.

Try looking into the tank under subdued lighting late at night: I doubt whether you would then find this fish looking or behaving as though it were in the least little bit worried. I hope so, at any rate!

I have designed a filter for tropical aquariums and believe the principle is unique. I would like to patent the idea and would be glad of your advice on doing this.

If I did take out a patent on the idea, could I then offer it to large aquarium equipment firms, without the fear that they may copy the idea?

Whether or not to patent an invention is a matter for fine judgment, but details of the procedure which you are required to go through may be obtained from the Patent Office, London. The main trouble is that you have to spend a lot of money in the course of patenting a device. Registration, which involves placing a full and detailed specification, costs about £250! Even if you stay the course you may find that some other chap with a slightly different slant has beaten you to it with a similar patent, and this is all very frustrating. You also have lots of problems in manufacturing and marketing from your own patent, and if you are not used to this sort of activity you can come to grief.

If you did patent your idea and offered it to a firm, much would depend on the integrity of that firm as to whether you received maximum benefit. You might expect them, on the whole, to try to develop something like your device without actually infringing the copyright, and then you might have legal conflict—another potentially expensive undertaking.

To have real prospects your idea must be really good—and I hope that it is! If you get to the point where you think you are ready to talk to a firm, write to me privately and I will recommend one or two people whom I would especially trust. If you know anyone like this in the trade, it could be worthwhile to get a second opinion before you got started, but, alas, there are not all that many folk around to whom one can safely confide. I wish you luck in this undertaking, and hope that I have not been too much of a deterrent. I should also consider the use of a solicitor if you do decide to go ahead.



COLDWATER Queries

by Arthur Boarder

I have a pond, 12 ft. x 10 ft. x 2½ ft. which was made last July. It was planted with a water lily and irises which were set in upturned turf. The water has turned a murky brown and I wonder how often it should be changed. The plants have died down and will they grow again in the spring?

It was a mistake to place the turves on the bottom of the pond. The water has turned brown because of the decomposition of them. You will have to empty the pond and remove the turves before refilling. The water plants should be set in separate containers and a little turf could be placed in the one container for the water lily. Most water plants die down in the winter and will grow again in the spring. It is usual to clean out a pond every late autumn.

Could you please let me know of any breeder or specialist in the Home Counties who can supply varieties of fancy goldfish which can be viewed before purchase? Also where can I get good water plants?

I am enclosing the name and address of a breeder and supplier who can show you the fishes and plants you need. I agree that it is much more convenient to see what you are paying for instead of waiting for the fishes, etc., to arrive.

I have a number of small fancy goldfish and Koi in a tank, 48 in. x 15 in. x 12 in. Several have blood streaks in their tails and one or two of them have fraying tails. However, they are still feeding on a diet of dried shrimps, maggots, worms, *Daphnia* and *Tubifex*. Can you suggest a cure?

Before treating the affected fish it may be a good idea to try to find the cause of the trouble. It is often caused by bad conditions in the tank and over-stocking. Bacteria may have been introduced with the *Daphnia* or *Tubifex*. My thoughts on these should be well known by now. I would cut out all live foods which live in water and stick to the first three live foods you mention together with flake food. Having sorted out the cause you can then try a cure. Make a solution of one part T.C.P. to four parts of water. Then dip the affected parts of the fish in it for a short time. This treatment will have to be repeated for a few days and providing the cause of the disease has been eliminated from the tank a cure should be possible.

I am setting-up a small tank for a few goldfish. I think that one type of water plant will be enough as I do not want the tank to be over-crowded. Which plant do you recommend?

My choice would be *Vallisneria spiralis*. If several small plants are set in the coarse sand base compost, they will thrive and last you for the rest of your life. I still have a good planting of *Vallis*, in a tank and had the original stock over thirty-four years ago. I occasionally have to remove some of the young off-sets but otherwise the plants are no trouble at all. The strap-like leaves do not grow too long and are good oxygenators.

I have a garden pond with a number of goldfish in it. I have had the pond for several years but have never seen any young goldfish, yet my friend gets some in his pond every year. Can you suggest any reason?

There are several reasons why you find no fry in your pond. In the first place there must be both sexes in the pond but as you state that you have several goldfish it is improbable that both sexes are not represented. The size of the pond in relation to the number and sizes of the goldfish will also make a difference. If a pond is over-stocked with fishes it is very unlikely that any fry would escape being eaten. Another very important fact is that if there are plenty of underwater plants with dense foliage, many fry can then escape being eaten whereas in a pond devoid of underwater plants, any fry hatched could hardly be expected to survive.

Water snails can eat the eggs if any are in the pond and newts can eat small fry as can several water creatures such as diving beetles and their larva. Dragonfly larva can also eat fry. Next breeding season try anchoring a bunch of fine-leaved water plants at the edge of the pond near the surface and then watch the fish on early mornings. You will see if they are spawning by the very vigorous chasing and when eggs are seen you can transfer the bunch with eggs to a safe place for hatching and rearing.

I am interested in some of the sunken "stone" type figures I have seen in local aquaria and would like to make some myself. However, if they are made with concrete will there be any danger from them to the fishes?

Any fresh concrete is almost sure to give off free lime, and this can be very dangerous to water life. No true aquarist would ever use figures, such as divers, sunken wrecks or windmills in his tanks. Stick to an underwater scene created with small rocks or stones which you can find in rivers, etc., and after a sterilisation they will be fine for your purpose. If you cannot get such specimens, then get some Westmorland rockery stone. This you can shape to anything you want with a cold chisel and a hammer.



KOI Queries

by Hilda Allen

We used to have a pond measuring 11 feet by 4 feet in which we kept six Koi. They were very shy and we hardly ever saw them and eventually, when my brother left he took them with him. We had no pump and wondered if the lack of water movement had any effect on the Koi? Due to alterations we now only have room for an 8 feet by 6 feet pond, 4 feet deep in one area. We hope to have under-gravel filtration later on but I estimate this pond could safely hold 4 or 5 10 inch Koi without filtration. Will they remain as shy and retiring as the others? I enclose a sketch of my pond, your comments would be most useful, I calculate I shall need a 14 feet by 12 feet sheet of Butyl.

Do you know any B.K.K.S. members locally who could advise and supply fish, especially any members that do not use filtration. I am interested in SHUSUI, KOHAKU and SANKES, I cannot afford top show quality fish but I want attractive and above all, healthy Koi. Would 4 to 8 inch Koi, bought in July, be able to winter outdoors this year?

I am interested to know about genetics and breeding, do colours breed true etc., and your help will be most welcome.

With regard to your question whether movement of water such as by a pump would have any effect on the shy behaviour of your Koi, the short answer is NO! You do not mention the depth of water in your original pond, but if shallow, the fish would not feel secure; on the other

hand it is not known what attempts, if any, were made to make the Koi responsive to feeding and thereby used to people.

For example, my own Koi come rushing over to their regular feeding area upon becoming aware of approaching footsteps and even congregate if I stamp my (large) feet in the kitchen. By feeding small amounts, but often, the ever-hungry Koi have learned to associate footsteps, people and food.

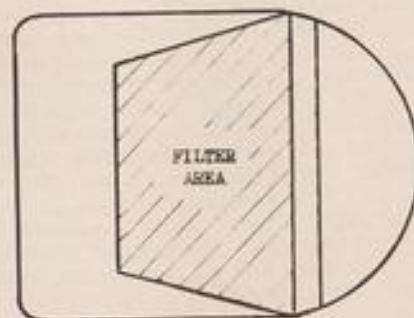
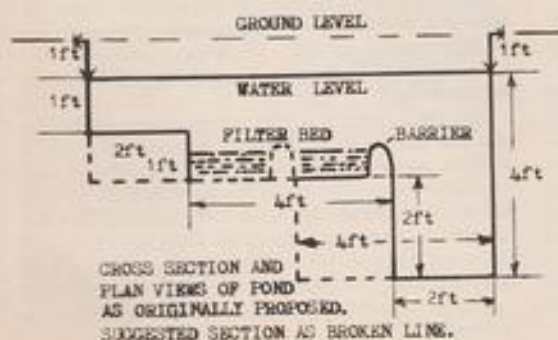
The enclosed sketch of your pond indicates that it will hold no more than about 550 gallons of water, mainly because of the proposed shelf area and rounded deep end. Although having a depth of 4 feet in one part I do not think you should contemplate keeping 10 inch Koi in such a small volume of water without some filtration.

The liner required is more than you have estimated and the size should be nearer 18 feet by 16 feet. Any waste pieces can be utilised for reinforcing under the gravel bed area. By making your pond rectangular, deleting the shelf so that the shallow end is taken down to the 2 feet depth and moving the filter as shown by the broken lines on the drawing, the liner will be used more economically and a greater volume of water, of about 900 gallons, will be provided.

Assuming a gravel bed of at least 6 inches, the apparent depth of water will thus be 18 inches which will not be excessive as the Koi grow. If you adopt the above-ground with a low wall version of the pond drawing in the April magazine, you will not only have a more functional pond but should be able to make some saving on the size of liner.

Koi that are 6 inches in summer, in good health and fed well for as long as possible according to weather conditions, should be expected to safely over-winter outdoors the same year.

You refer to The British Koi-Keeper's Society and request details of local members in your area. I can immediately state that there are many, plus an active local section. However, it would be less than fair to this or any other society if I were to divulge members' names and private addresses to all and sundry. By joining the Society and learning of the local sections nationwide you will have access to advice on your questions of local members and suppliers.





from Aquarists' Societies

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

SOUTH WEST



TWO speakers dealt with the show standards of the Shubunkin to members of the Bristol A.S. Victor Cole, with the help of an overhead projector, used outline drawings to mark the progress that led to the present Bristol Standard. Victor Capaldi underlined the points previously made with pictures of prize-winning Shubunkins from his collection of colour slides. Table Show Results: Goldfish: 1 and 4, W. G. Ham; 2 and 3, 1. Milden. Fantails: 1, 2, 3 and 4, C. Summers. Veiltails: 1, 2, 3 and 4, J. Day.

ALTHOUGH entries were down on last year at the Taunton and District A.S. open show on 15th April, the public response was more than double, making a busy and enjoyable day for all concerned.

Results: Barbs: 1, R. F. Adams (Salisbury); 2 and 4, D. Young (Dorchester); 3, J. Randle (Plymouth). Characins (all and 18 and 19): 1, D. Kerr (Salisbury); 2, B. Symes (Dorchester); 3, C. Amey (Dorchester); 4, M. Brown (Salisbury). Characins (A.O.V.): 1, R. F. Adams (Salisbury); 2, W. West (Salisbury); 3, M. Paxton (Plymouth); 4, P. May (Reading). Cichlids: 1 and 2, P. May; 3, D. Kerr; 4, P. Hammett. Dwarf Cichlids: 1, J. Varndell (Plymouth); 2, M. Berry (Taunton); 3, J. Jackson (Taunton); 4, M. Paxton. Rift Valley Cichlids: 1, S. Fisher (Salisbury); 2, D. Edleston (Salisbury); 3, J. Nathan (Plymouth); 4, S. Watts (Taunton). Labridae: 1, F. A. Hammett; 2 and 4, R. Luscombe (Plymouth); 3, R. F. Adams (Salisbury). Killifish: 1, R. F. Adams (Salisbury); 2, J. Jackson; 3, D. S. Langdon (Yeovil); 4, R. Bond (Yeovil). Catfish: 1, D. Mahara (Taunton); 2, W. West (Salisbury); 3, R. Cooper (Taunton); 4, Mrs. O. Lofthouse (Torrey). Corydoras: 1 and 2, P. May; 3, R. F. Adams; 4, Mrs. O. Lofthouse. Barbora: 1 and 2, R. Luscombe; 3, P. R. Cooke (Plymouth); 4, J. Jackson. Danio and W.C.M.M.: 1, J. Jackson; 2, M. Sheldrake (Taunton); 3, R. Fitzgerald (Taunton); 4, M. Sheldrake (Taunton). Loaches: 1, Mr. Fitzgerald (Dorchester); 2, P. A. Hammett; 3 and 4, M. Trant (Taunton). A.O.V. Tropical: 1, D. Kerr; 2, R. Luscombe; 3, D. Sindell (Reading); 4, J. Varndell (Plymouth). Labridae: 1, P. A. Hammett; 2, M. Trant; 3, D. Sindell. Serot Pair (Egglayers): 1, W. West; 2, R. Luscombe; 3, C. Amey; 4, J. Jackson. Serot Pair (Livebearers): 1 and 2, P. Cooke; 3 and 4, D. Sindell. Male Guppy: 1, A. Marlborough (Taunton); 2, J. Hookway (Taunton); 3, D. Sindell; 4, C. Amey. Female Guppy: 1 and 2, W. West; 3, P. Cooke. Swordtail: 1, D. Kerr; 2, P. Hammett; 3, Mrs. O. Lofthouse; 4, W. West. Platys: 1, D. Young; 2, J. Randle (Plymouth); 3, J. Hookway; 4, D. Edleston (Salisbury). Molly: 1, M. West. A.O.S. Livebearer: 1, R. F. Adams; 2, D. Edleston; 3, D. Sindell; 4, P. R. Cooke. Single Tail Goldfish: 1, R. F. Adams; 2 and 3, D. S. Langdon (Yeovil); 4, Julie Randall (Plymouth). A.O.S. Coldwater: 1 and 4, A. McKinley (Plymouth); 2, J. Jackson;

J. D. Kerr. Egglaying Breeder's Team: 1 and 2, Nathan (Plymouth); 3, D. Edleston; 4, D. Lily (Salisbury). Breeder's Team (Livebearer): 1 and 2, P. R. Cooke; 3, C. H. Amey (Dorchester); 4, R. F. Adams.

OPEN SHOW results of Bristol Tropical Fish Club. Barbs: 1 and 3, A. Chaplin; 2, P. C. Martin. Characins: 1, B. Touss; 2, A. Chaplin; 3, McDermid. Characins: 1, P. Moya; 2, A. Chaplin; 3, L. R. Gayle. Angelfish: 1, J. Jackson; 2, R. J. Marlow; 3, M. Gifford. Apistogrammas, etc.: 1 and 2, P. Fitchett; 3, McDermid. African Rift: 1 and 3, R. Gayle; 2, McDermid. A.O.S. Cichlids: 1 and 3, L. R. Gayle; 2, P. Fitchett. Bettas: 1, L. R. Gayle; 2, A. Phillips. Labyrinth: 1 and 2, Perpetual Trophy, P. Moya; 3, A. Chaplin. Egglaying Toothcarps: 1 and 2, J. Jackson; 3, J. Brennan. Tropical Catfish: 1, A. Chaplin; 2, D. Spence; 3, J. Thorpe. Corydoras, Apudoras brachius: 1, 2 and 3, P. Moya. Barbora: 1 and 2, M. Davies; 3, P. C. Martin. Danios: 1, J. Jackson; 2, J. Trussell; 3, R. J. Marlow. Loaches, Botia: 1, M. Gearing; 2 and 3, C. Thomas. A.O.S. Tropical Egglayer: 1, L. Strang; 2, A. Chaplin; 3, L. R. Gayle. Pair of Fish: 1, J. Jackson; 2, R. Giles; 3, P. Fitchett. Guppy (Male): 1, W. Holland; 2, R. J. Marlow; 3, P. Cripps. Guppy (Female): 1, W. Holland; 2, P. Cripps; 3, J. Brennan. Swordtails: 1, A. Chaplin; 2, L. Strang; 3, Bennett. Platys: 1, P. Cripps; 2 and 3, P. Moya. Molli: 1, Bennett; 2, L. R. Gayle; 3, A. Phillips. A.O.S. Livebearer: 1 and 2, P. Moya; 3, L. Strang. Breeder (egglayer): 1, P. Moya; 2, J. Jackson; 3, D. Lily. Breeder (livebearer): 1, Bennett; 2, P. Cripps; 3, P. Fitchett.

NEW SECRETARY

Salisbury & District A.S.: A. J. Becher, 3A Wilton Road, Salisbury SP2 7ED.

SOUTH EAST



AT the April meeting of the Mid-Sussex A.S. the main part of the evening was taken up with a Bring and Buy Sale and a Quiz on various subjects. The monthly 50 club draw winners were: 1, J. Bantles; 2 and 3, N. Short. The table show was judged by Mr. Jack Stillwell of Portsmouth A.S.

Results: Guppies: 1, 2 and 3, S. Smith (Mid-Sussex). Barbs: 1 and 4, B. and T. Tester (Mid-Sussex); 2, B. Savers (Brighton); 3, P. Levine (Mid-Sussex). Characins: 1, B. Savers; 2, Mr. and Mrs. Raggio (Brighton); 3, P. Levine; 4, E. and T. Tester. Labyrinth: 1, Mr. Gosticher (Brighton); 2, Mr. and Mrs. Bridle (Brighton); 3, R. and T. Tester; 4, J. Birch (Mid-Sussex). Barbora: 1 and 2, B. Savers; 3, P. Levine; 4, Mr. and Mrs. Hills (Brighton). Loaches: 1, B. Savers; 2 and 3, Mr. and Mrs. Hills; 4, L. Penny (Mid-Sussex). The first leg of the Over the Downs resulted in 4 wins for Brighton and Southern with a total of 34 points, against Mid-Sussex 25. Meetings are held on the second

Thursday of every month at Oakley Lodge, Oakley Lane, Keymer, from 8 p.m. Further information from the secretary, Mr. John Birch, 11a Sandrock Way, Haywards Heath, Sussex (phone: 11. Heath 50585).

Reading and District A.S. open show on 20th April attracted 467 exhibitors of a high standard. Best Fish in Show and the F.B.A.S. Championship Trophy for Goldfish was won by Mr. M. Fox for a *Carassius auratus* (Three Banded Pencil Fish).

Other results: Abbreviations: (A) Abingdon; (B) Basingstoke; (BM) Bournemouth; (BR) Bracknell; (H) Havant; (K) Kingston; (M) Mid-Sussex; (N) Newbury; (NW) North Wilt; (R) Reading; (RS) Rushmore; (S) South East London A.S.; (SW) Swadby; (T) Tongham; (TB) Tonbridge; (U) Uxbridge; (W) Wycombe Marsh; (WA) Walthamstow; (WE) Welwynborough; (—) Not known.

Class Set: 1, A. Campion (R); 2, W. A. Knight (H); 3, A. P. Taylor (SW); 4, Mr. Richards (SW). Age: 1, Mrs. J. C. Martin (B); 2, Mrs. S. Larkin (K); 3, Mrs. G. Roshbrooke (R); 4, M. Bird (T). Be: 1, Mr. and Mrs. Canning (S); 2, E. and T. Tester (M); 3, Mrs. S. Larkin (R); B: 1, P. Martin (B); 2, P. Levine (—); 3, A. Campion (R); 4, D. Brown (H). Ca: 1 and 2, Mr. Richards (SW); 3, P. Handley (—); 4, G. Savage (R). Ch: 1, M. Fox (W); 2, Mr. B. Cox (W); 3, M. Bond (S); 4, Mrs. Edwards (—). C: 1, P. Merritt (R); 2, Mrs. S. Larkin (R); 3, E. and T. Tester (M); 4, T. Gibson (SW). D: 1, L. Gale (N); 2, J. Jeffery (BM); 3, D. Brown (H); 4, M. and D. Chapman (B). Dc: 1, W. A. Knight (H); 2, L. Gale (N); 3, Mrs. B. Johnson (U); 4, J. V. Payne (S). D: 1, W. A. Knight (H); 2, P. May (R); 3, B. Hastings (—); 4, P. Taylor (NW). E: 1 and 2, A. P. Taylor (SW); 3, Mr. and Mrs. Canning (N); 4, L. Gale (N). F: 1, Mr. and Mrs. Canning (N); 2, A. P. Taylor (SW); 3, Mr. and Mrs. Haines (—); 4, P. and I. Taylor (SW). F: 1, 2 and 4, R. Prior (N); G: 1, Mr. Richards (SW); 2, C. Oshouse (S); 3, Mr. and Mrs. Canning (N); 4, J. V. Payne (S). H: 1 and 2, Mr. and Mrs. Canning (N); 3, Mrs. P. Woodland (B); 4, D. Goss (R); 2, 3 and 4, Mrs. E. Davies (—). K: 1 and 3, D. Goss (R); 2, C. Toms (R); 4, P. and I. Taylor (SW). L: 1 and 4, Mr. Richards (SW); 2, N. Jackson (R); 3, H. Armitage (H). Ma: 1, Mr. and Mrs. Canning (N); 2, Mrs. I. Strang (B); 3, Mrs. E. Davies (—); 4, A. Aitken (H). M: 1, Mr. P. Merritt (R); 2, J. A. Bath (—); 3, D. and P. Lambert (K); 4, A. Chaplin (B). N: 1, L. Locky (B); 2, Mr. Richards (SW); 3, T. Burvill (B); 4, A. P. Taylor (SW). N-b: 1, D. Goss (R); 2, M. Fox (W); 3 and 4, Mrs. E. Davies (—). N-b: 1, J. Humphreys (A); 2, M. Fox (W); 3, L. P. Lovemore (B); 4, Mrs. E. Davies (—). S: 1 and 4, D. and P. Lambert (R); 2, P. Cripps (N); 3, Mrs. E. Davies (—). O: 1, P. and I. Taylor (SW); 2, Miss G. Stoddard (R); 3, R. T. Stoddard (R); 4, Mrs. P. Cripps (N). P: 1, C. Toms (R); 2, Mrs. B. Cripps (N); 3, D. Sindell (R); 4, L. Hart (W). Q: 1, M. D. Chapman (B); 2, P. Taylor (N); 3, D. Goss (R); 4, T. Burvill (B). R: 1, Mrs. P. Cripps (N); 2, G. Savage (R); 3, F. G. Holding (WA); 4, P. Taylor (NW). S: 1, Miss C. Shepherd (—); 2, C. Hancock (H); 3, Mrs. L. Gale (W); 4, Mrs. M. Bird (T). T: 1 and 4, Mr. Strang (B); 2, Mr. Richards (SW); 3, P. Martin (B). U: 1, Master R. Fox (W); 2 and 3, W. A. Knight (H); 4, P. Taylor (NW). V: 1, Mrs. S. Larkin (R); 2, P. Ratcliffe (TB); 3, P. J. Whidden (TB). W: 1 and 2, Mr. and Mrs. Canning (N); 3, D. P. Lambert (R); 4, P. Taylor (NW).

THE Tongham A.S., who meet at the Central Club 13 South Street, Farnham every first and third Thursday each month at 8.15 p.m., have 24 members, among them an FBAS Speaker and Judge. Committee: chairman, Pete Edwards; treasurer, Keith Wrath; secretary, Ray Cooke; show secretary, Maurice Bird; assistant show secretary, Terry Truett. The club are looking for new Members, experienced aquarists or newcomers to fish keeping. One can always pick up breeding tips, disease cures, general fishkeeping from most of the Club Members. Forthcoming events: 5th June, tape talk and Table Show on all Cichlids; 19th June, Rod Norris to demonstrate how to make all glass tanks and Knockout competition. For details phone Alderhot 31470-2435.

THE Wycombe Marsh A.S. meet at 8 p.m. at the Social Club, Radice Ltd., Loudwater, High Wycombe, Bucks. The programme for June:

July includes a Tape Slide on Furnished Aquarist and Aquascaper; D. Hickman on Fish House Construction; Fishy Facts and Fiction; and Tape Slide on Characins. Further details from the society, Jeff Woodbridge, 16 Mount Pleasant Lane East, High Wycombe, Bucks.

THE Brighton & Southern A.S. are now holding their meetings at St. Barnabas Church, Hall, Sackville Road, Hove. Meetings commence at 8 p.m. on the 1st and 3rd Mondays of the month. The new secretary is: Mrs. Edna Smith, 1 Windmill Copse, Storrington, Sussex RH10 4HB. (Tel: Storrington 5042).

NEW SOCIETY
A NEW SOCIETY has been formed in the Worthing area known as **The South Downs A.S.** (S.D.A.S.). Regular monthly meetings are held at "The Marquis of Granby" (Sitting), Anyone who would like to join the society is invited to attend or to contact the Press Secretary, Clive Lipscomb, 5 Waverley Road, Worthing, Sussex. (Tel: Worthing 43612).

MIDLANDS AND WALES



WHEN the scheduled speaker failed to arrive at the **Birmingham Fishkeepers Society's** April meeting, members fell back upon their emergency programme—A Fish Quiz. Secretary Edna Thornton acted as quiz master. The Table Show featured Corydoras and A.O.V. Catfish, with results as follows: Corydoras: 1 and Trophy winner, Mrs. J. Hensel; 2 and 3, F. G. Thornton. A.O.V. Catfish: 1 and 2, F. G. Thornton; Joint 2, Mrs. J. Hensel.

The Society meets on the first Wednesday of every month at 8 p.m., at Church House Meeting Rooms, Edgbaston. New members and visitors are welcomed. Secretary: E. M. Thornton, 41 Crooks Lane, Studley, Warks. (Tel: Studley 7125).

CHANGE OF VENUE
Evstham Fishkeepers Society will meet at Church House Meeting Rooms, Evstham, from June and onwards.

AT the annual open show of **Malvern and District A.S.**, on 26th April, results were: Best Fish in Show: S. Grainger, with a *B. niloticus*. F.R.A.S. championship trophy for Class 9a (Large Cichlids), R. Davis with a *Mystus* species. Malvern members point trophy was awarded to P. S. Parsons. Other results: Killifish: 1, Mrs. G. Henson; 2, T. A. Cruckshank; 3 and 4, G. J. Crumpton. Fishers: 1, T. Hawkins; 2 and 3, M. Kirkham; 4, J. Walton. A.O.V. Characins: 1, T. Lyns; 2 and 3, C. Thomas; 4, R. Young. A.O.V. Anabantids: 1, P. Moore; 2, P. S. Parsons; 3 and 4, Mr. and Mrs. S. Yallop. Dwarf Cichlids: 1 and 2, P. R. and M. D. Fitchett; 3, J. Walton; 4, M. Twissborough. Angelfish: 1, T. Hawkins; 2, W. Trussell; 3, L. Parks; 4, R. Lancum. Single Trained Goldfish: 1, 2 and 3, R. H. Thackway; 4, G. Emptage. A.O.V. Cichlids: 1, A. Jones; 2, P. R. and M. D. Fitchett; 3, R. Miles; 4, S. Biddle. Corydoras and Brochis: 1, P. A. Moore; 2 and 3, T. A. Cruckshank; 4, P. A. Moore. Tropical Catfish: 1, J. Walton; 2, D. Mahari; 3, R. Davis; 4, P. Thorpe; 5, L. Parks; 6, S. Sanders. Rarities: 1, M. Johns; 2, M. Kirkham; 3, S. Sanders; 4, A. Evans. Danios and W.C.M.M.: 1, T. Lyns; 2, M. Kirkham; 3, P. Thorpe; 4, T. Lyns. A.O.V. Egg Layers: 1, R. Stoker; 2, T. A. Cruckshank; 3, Mrs. G. Henson; 4, T. Walton. Guppies (Male): 1, J. Hodges; 2 and 3, J. Walton; 4, M. Jenkins. Guppies (Female): 1, Mrs. G. Henson; 2, M. Kirkham; 3, P. Thorpe; 4, W. Holland. Sharks: 1, S. Biddle; 2, G. Emptage; 3, P. S. Parsons; 4, L. Parks. Multi-Trained Goldfish: 1, M. Kirkham; 2, M. Bader; 3, A. Evans; 4, Mrs. B. Perks. Neon: 1, W. Holland; 2, P. R. and M. D. Fitchett; 3, M. Kirkham; 4, R. Young. Plantes: 1, C.

Thomas; 2, G. J. Crumpton; 3, T. Hawkins; 4, W. Holland. Swordtails: 1, G. J. Crumpton; 2, P. S. Parsons. A.O.S. Goldwater: 1, A. P. Parsons; 2, M. Twissborough; 3, P. S. Parsons; 4, F. G. Thornton. Barbs: 1, Mrs. D. Cruckshank; 2, A. Hensel; 3, Mrs. D. Cruckshank; 4, T. Lyns. Barbs (Large): 1, G. J. Crumpton. Rift Valley Cichlids: 1 and 2, D. McDermid; 3 and 4, F. G. Thornton. Teams of four Egg-layers: 1, P. R. and M. D. Fitchett; 2, D. McDermid; 3, Mrs. S. Walters. Teams of four Livebearers: 1, N. Binding; 2, P. S. Parsons; 3, P. R. and M. D. Fitchett; 4, A. Howard. H.B. and C.C.: 1, T. Hawkins; 2, T. A. Cruckshank; 3, D. McDermid; 4, A. Jones. Breeders (Pair): 1, P. R. and M. D. Fitchett; 2, A. Howard; 3, T. Lyns; 4, M. Kirkham. Loaches and Botias: 1, S. Grainger; 2, C. Thomas; 3, P. S. Parsons; 4, R. Stoker. A.O.V. Livebearers: 1 and 2, Mrs. D. Cruckshank; 3 and 4, A. Howard. Furnished Aquaria: 1, P. S. Parsons; 2, A. P. Parsons.

NORTH



NEW SECRETARY
South Shields A.S.: Alan Franks, 1 Strick Road, Jarrold, Tyne & Wear.

THE following were elected to the **Hoylake A.S.** committee at their March AGM: chairman, D. Laking; vice-chairman, K. Hand; secretary, G. Robinson; treasurer, Mrs. S. Laking; show secretary, S. McGreal; general committee members, P. Edwards and Mr. and Mrs. Wilkinson. The society meets on the second and fourth Tuesdays of the month at the "Coach and Horses", Moreton, Warral at 8 p.m. Visitors are most welcome. The club would appreciate the names of anybody willing to give lectures, etc. on any aspect of the hobby. Speakers please contact S. McGreal (tel: 051 678 8661).

Sheaf Valley A.S. open show results. Guppies: 1, Mr. and Mrs. Blades (Fishkeepers); 2, M. and N. Hancock (Haford); 3, Mr. and Mrs. Lunn (Barnsley). Mollies: 1, Sutton & Harris (Barnsley); 2, Mr. and Mrs. Hancock; 3, Mr. and Mrs. Mitchell (Worksop). Plantes: 1, Mr. Clarke (B.B.C. Thorne); 2, D. Marples (Ashfield Fishkeepers); 3, Mr. and Mrs. Goucher (Goole). Swords: 1, Mr. and Mrs. Smith (Zemith); 2, Mr. and Mrs. Blades (Fishkeepers); 3, Mr. and Mrs. Simpson (Deeside). A.O.V. Livebearers: 1, Mr. Clarke (B.B.C. Thorne); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Sutcliffe (Sheffield). Small Anabantids: 1, Miss Motterhead (Bradford); 2, Mrs. Anderson (Ind.); 3, Mr. and Mrs. Wainwright (Fishkeepers). Large Anabantids: 1, H. Carr (Ponter's Aquatics); 2, Mr. and Mrs. Wainwright; 3, K. Lancum (Doncaster). Fishers: 1, Mrs. M. Gray (Hull); 2, Mr. Cook (Haford); 3, Mr. Smith (Sheffield). Corydoras: 1, Mr. Cruckshank (Sheffield); 2, H. Buckley (Fishkeepers); 3, M. L. Price (Rothwell). A.O.V. Catfish: 1, T. Stanfield (Sheffield); 2, Mr. and Mrs. Golland (Sheaf Valley); 3, D. Marples (Ashfield Fishkeepers). Loach and Botia: 1, Mr. and Mrs. Blades; 2, Mr. and Mrs. Barlow (Sheaf Valley); 3, E. and A.M. Rice (Barnsley). Small Barbs: 1, Mr. and Mrs. Kemp (Sheaf Valley); 2, Mr. and Mrs. Clifton (Sheffield); 3, A. E. Hupp (Knapthorpe). Large Barbs: 1 and 2, Mr. and Mrs. Kemp; 3, A. Marples. Small Characins: 1, Mr. and Mrs. Richardson; 2, H. Buckley; 3, A. Marples. Large Characins: 1, Mr. and Mrs. Dimes (Doncaster); 2 and 3, Mr. and Mrs. Smith (Zemith). Rarities: 1, A. Simpson (Barnsley); 2, Mr. and Mrs. Lake (South Humber-side); 3, Mr. Cook. Minnows and Danios: 1, Master M. Lake (South Humber-side); 2, Mr. and Mrs. Lake; 3, Miss Motterhead (Bradford). Dwarf Cichlids: 1 and 2, M. L. Price; 3, Miss L. Motterhead (Bradford). Large Cichlids: 1, A. Onslow (Loughboon); 2, R. Fisher (Ashfield Fishkeepers); 3, R. Ryan (Ashfield Fishkeepers). Rift Valley Cichlids: 1 and 2, Mr. Hollingworth (Sheffield); 3, T. Reid (Fishkeepers). Angels: 1, Mr. and Mrs. Hadcock (Aireborough); 2, D. Harris

Meabro; 3, P. Stanham (Sheaf Valley). A.O.V. Tropical (small): 1, T. Cruckshank; 2, D. Harris (Meabro); 3, T. Reid. A.O.V. Tropical (large): 1, Mr. and Mrs. Smith; 2, A. Dabbling (Wyke); 3, A. Hodgson (Darfield). Sharks and Foams: 1, Mr. and Mrs. Clifton; 2, M. L. Price; 3, A. Cook. Toothcarps: 1, S. Hill (Aireborough); 2, Mr. and Mrs. Blades; 3, D. Harris. A.V. Female egg: 1, Mr. and Mrs. Dimes; 2, Mr. and Mrs. Holland (Rothwell); 3, Mr. and Mrs. Lake. A.V. Female (live): 1, D. Barrett (B.B.C. Thorne); 2, Mr. and Mrs. Dimes; 3, M. Spier (Skippers). Pairs (livebearers): 1, Mr. D. Cruckshank; 2, Mrs. Anderson (Ind.); 3, D. Lacey (Fishkeepers). Pairs (eggs): 1, D. Harris; 2, A. Simpson; 3, H. Buckley. Breeders (live): 1, A. & B. J. Banks (B.B.C. Thorne); 2, A. Smart (Chesterfield); 3, Mr. and Mrs. Hill (Barnsley). Breeders (live): 1, Mr. and Mrs. Sutcliffe (Sheffield); 2, B. Banks; 3, Mr. and Mrs. Hill. Breeders (egg): 1, D. Barrett; 2, Mr. and Mrs. Waller (Chesterfield); 3, Mr. and Mrs. Wainwright (Barnsley). C & D: 1, D. Harris; 2, B. Clark (Aireborough); 3, M. L. Price. Goldfish and Comets: 1, K. Chapman (Meabro); 2, Mr. and Mrs. Waller; 3, Mr. and Mrs. Alastair (Ashfield Fishkeepers). Fancy Goldfish: 1, B. Brook (Huddersfield); 2, Miss Goucher (Goole); 3, K. Chapman. A.O.V. Goldwater: 1, Mr. and Mrs. Snowden (York); 2, B. Wiggles (Meabro); 3, Mr. and Mrs. Tootill (York). Mini Jaws: 1 and 2, Mr. and Mrs. Hooley (Fishkeepers); 3, Mr. and Mrs. Holland. Plants: 1, Mr. and Mrs. Hooley; 2, Mr. and Mrs. Golland; 3, N. Metcalfe (Wyke). There were 450 entries, and Best in Show was a very good Tinfoil Barb belonging to Mr. and Mrs. Kemp (Sheaf Valley).

Hyde A.S. held their 11th open show on Easter Sunday at the Hatterley Community Centre, Hatterley Road East, Hatterley, Hyde, Cheshire. It was a great success with 500 entries in the 26 sections. Section winners are as follows: Livebearers: G. Clark (B.B.C. Thorne); Barbs: A. Vansire (Liverpool); Characins: Mr. and Mrs. Underwood (Sandground); Anabantids: Mr. and Mrs. P. Yates (Darwen); Cichlids: J. Corbett (Merseyside); Catfish: Mr. and Mrs. Baldwin (Sandground); Egg-laying Toothcarps: P. S. A. Hopwood (Darwen); Rarities, Danios and Minnows: Mr. and Mrs. Underwood; A.O.V.: Mr. and Mrs. P. Yates. Marlines: J. Lawless (Leigh). Pairs: D. Barrett (B.B.C. Thorne). Breeders: Mr. and Mrs. Wainwright (Fishkeepers). Juniors: Master K. Corbett (Merseyside). Minis: F. S. A. Hopwood. Goldwater: Mr. and Mrs. Waller (Chesterfield). Goldwater Breeders: M. Bough (Leigh). Best Fish in Show was won by Master K. Corbett, of Merseyside society. Competition against the highest points was Mr. and Mrs. Underwood, of Sandground society. Hyde A.S. would like to thank Gyle Life Aquatics for the excellent trade stand and donations. Crystal Clear for their very kind and generous donations, and all aquarists from the other 26 societies who attended the show.

RESULTS of the inter-society table show held on 16th April at the Warrington and Castle Old Friends Club, Barbers Lane, off Queensgate, Castle Northwich, Cheshire. Abbreviations: (NO) Northwich; (WN) Wreatham; (WA) Warrington; Guppies: 1, A. Edwards (WX); 2, S. Kent (WX); 3, C. Kent (WA). Swordtails: 1, S. Kent (WX); 2, A. Handlett (N); 3, C. Baker (WA). Barbs: 1 and 2, G. Kent (WX); 3, S. Kent (WX). Dwarf Cichlids: 1, Best Fish in Show; L. and D. Thorne (N); 2, G. Kent (WX); 3, J. Buckley (N). Minnows: 1, L. Bradley (N); 2 and 3, A. Edwards (WX). Catfish: 1, A. Handlett (N); 2 and 3, K. Lawless (WA). Characins: L. and D. Thorne (N); 2, Mr. and Mrs. Mather (WX); 3, K. Lawless (WA). Fishers: 1, A. Handlett (N); 2, S. Gallimore (N); 3, S. Kent (WX). Egg-layers (Pairs): 1, L. and D. Thorne (N); 2, A. Edwards (WX); 3, G. Kent (WX). Livebearers (Pairs): 1, A. Handlett (N); 2, J. Righam (WA); 3, C. Goldfish (WX). Society points: Wreatham, 27; Northwich, 25; Warrington, 8.

RESULTS of the **Swillington A.S.** Mini Show held on 26th March: Guppies: 1, Mr. Gee (Wyke); 2 and 3, Mr. and Mrs. Lunn (Wath). Plantes: Swarbrath, Malvern; 1, M. J. Linton (Rothwell); 2, T. Stanfield (Sheffield); 3, Sutton and Harris (Wath). A.O.V. Livebearers: 1 and 2, T. Stanfield; 3, Mr. and Mrs. Wall (Wath). Small Characins: 1, M. J. Linton; 2, N. Metcalf (Wyke); 3, Mr. and Mrs. Froby (Wyke). Large Characins: 1, St. Stanfield (Bradford); 2, T. Gould (Wyke); 3, N. Metcalf. Angels: 1 and 2, Mr. and Mrs. A. Kenworthy (Aireborough); 3, Mr. and Mrs. Wall. A.O.V. Cichlids: 1 and 2, G. and C. Swain (Swillington); 3, J. and M. Prewer (Swillington). Small Barbs: 1, E. Lech (Rothwell); 2, Mr. and

Mrs. Lunt. Large Barbs: 1, Mr. and Mrs. Wall; 2, Mr. and Mrs. Lunt. Fighters: 1, S. Henshaw (Ind.); 2, Mr. and Mrs. Frisby; 3, Mr. and Mrs. R. K. Shaw (Ayrborough). A.O.V. Anabantids: 1, N. Cousins (Swillington); 2, B. Jackson (Ayrborough); 3, N. Cousins (Swillington). Corydoras: 1 and 2, T. Stansfield. A.O.V. Catfish: 1 and 2, T. Stansfield; 3, Mr. and Mrs. Frisby (Ayrborough). Agglayers (Pairs): 1, G. and C. Swain; 2, A. Sibery (Swillington); 3, N. Metcalf. Agglayer (Breeder): 1, G. and C. Swain. A.O.V. Tropical: 1, Mr. and Mrs. Frisby; 2, A. Thorpe (Swillington); 3, T. Stansfield. Sharks and Foxes: 1, Mr. and Mrs. R. K. Shaw; 2, N. Cousins; 3, Mr. and Mrs. A. Kenworthy. Rainbow Danios and Minnows: 1 and 2, Master S. Stansfield (Bradford); 3, Mr. and Mrs. Lunt. Egg-laying Toothcarps: 1, Mr. and Mrs. A. Frisby; 2, Judy Cook (Ayrborough); 3, Mr. and Mrs. A. Frisby (Swillington). A.O.V. Goldfish: 1, Sonson and Harris; 2, Mr. and Mrs. Ashton (Wyke); 3, Judy Cook. Best in Show: T. Stansfield (Sherwood). Best Society: Swillington and Wyke (26 points each).

Leigh A.S. Open Show on 26th April results:

Section A—Guppies: 1 and 3, P. Williams (Bridgewater); 2, M. Stephenson (Merseyside). Platos: 1, K. Corbett (Merseyside); 2, P. Harris (St. Helens); 3, M. Buckley (Bridgewater). Swordtails: 1 and 2, T. Casey (Bridgewater); 3, Mr. and Mrs. Stevenson (Woodside). Mollies: 1 and 3, Mr. and Mrs. Iddon (Sandgrounders); 2, M. Allison (Sandgrounders). Linnies: 1 and 2, P. Harris (St. Helens). Section Winner: 1, J. Dean (St. Helens); A.O.V. Livebearers: 1, Mr. and Mrs. Yates (Darwen); 2, T. L. Penny (St. Helens); 3, R. O'Connell (Woodside).

Section B—Small Anabantids: 1, J. Lynch (Merseyside); 2, S. Waterhouse (Leigh); 3, J. Corbett (Merseyside). Large Anabantids: 1, Mr. and Mrs. Underwood (Sandgrounders); 2, Mr. and Mrs. Stevenson; 3, M. Allison (Sandgrounders). Large Barbs: 1, Mr. and Mrs. Yates (Section Winner); 2, J. T. Morris (Leigh); 3, Mr. and Mrs. Baldwin.

Section C—Small Barbs: 1, Mr. and Mrs. Underwood (Sandgrounders); 2, Mr. and Mrs. Stevenson; 3, M. Allison (Sandgrounders). Large Barbs: 1, Mr. and Mrs. Yates (Section Winner); 2, J. T. Morris (Leigh); 3, Mr. and Mrs. Baldwin.

Section D—Small Characins: 1, Mr. and Mrs. Underwood; 2 and 3, R. Johnson (Hyde). Medium Characins: 1, Mr. and Mrs. Underwood (Section Winner); 2 and 3, L. Groves (Sandgrounders). Large Characins: 1, Mr. and Mrs. Underwood; 2 and 3, Mr. and Mrs. Yates.

Section E—Cichlids—Small American: 1 and 2, Mr. and Mrs. Underwood (Section Winner); 3, E. R. Walker (Merseyside). Large American: 1, Mr. and Mrs. Iddon; 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Moseley (Leigh). Small African and Asian: 1, Mr. and Mrs. Waterhouse (Leigh); 2, J. Corbett; 3, Mr. and Mrs. Iddon. Large African and Asian: 1, Mr. and Mrs. Underwood; 2, Mr. and Mrs. Iddon; 3, Mr. and Mrs. Baldwin. Angels and Discus: 1, G. Lawless (Leigh); 2, Mr. and Mrs. Stevenson; 3, Mr. and Mrs. Weaver (Warrington).

Section F—Rainbows: 1, Mr. and Mrs. Tomlinson (Macclesfield) (Section Winner); 2 and 3, K. Holmes (Bridgewater). Danios and Minnows: 1, Mr. and Mrs. Underwood; 2, L. J. Hopwood (Darwen); 3, T. L. Penny (St. Helens).

Section G—Labors and Sharks: 1, J. Corbett; 2, B. Steadman (Runcorn); 3, Mr. and Mrs. Iddon. Flying Foxes: 1, P. Kynyon (Sandgrounders); 2, R. O'Connell (Woodside); 3, E. R. Walker (Merseyside). Loaches: 1, Mr. and Mrs. Underwood; 2, J. Corbett; 3, P. Johnson (Bartford). Bories: 1 and 2, Mr. and Mrs. Underwood (Section Winner); 3, L. Fountain (Runcorn).

Section H—Corydoras and Brochis: 1, Mr. and Mrs. Baldwin (Section Winner); 2, A. and E. Berry (Bridgewater); 3, L. Groves (Sandgrounders). Synodontis: 1, Mr. and Mrs. Waterhouse; 2, Mr. and Mrs. Baldwin; 3, D. Parkinson (Stem). Suckermouth Catfish: 1 and 2, Mr. and Mrs. Baldwin; 3, Mr. and Mrs. Mulla (Merseyside). A.O.V. Catfish: 1, P. Kynyon; 2, L. Groves; 3, Mr. and Mrs. Underwood.

Section I—Killies (Top Spawns): 1, L. Buckley (Bridgewater); 2 and 3, K. Buckley (Bridgewater). Killies (Bottom Spawns): 1 and 2, K. Buckley (Section Winner); 3, B. Rowlands (Sandgrounders).

Section J—A.O.V. Tropical: 1, T. Morris (Leigh); 2, D. Stott (Oldham); 3, G. Airey (Leigh). A.O.V. Brackish: 1, L. Fountain (Runcorn); 2, T. Huxley (Bridgewater); 3, Mr. and Mrs. Moseley. A.O.V. Marine: 1 and 3, J. Lawless (Leigh) (Section Winner); 2, Mr. and Mrs. Moseley.

Section K—Pair Egg-layers: 1, Mr. and Mrs.

Underwood (Section Winner); 2, Mr. and Mrs. Baldwin; 3, A. and E. Berry. Pair Livebearers: 1, M. and N. Rimmer (Sandgrounders); 3, J. Dean (St. Helens); 3, A. and E. Berry. Pair Goldfish: 1, Mr. and Mrs. Underwood; 2, S. Almonough (Bridgewater); 3, M. and N. Rimmer (Sandgrounders).

Section L—Junior Egg-layers: 1, J. Baldwin (Sandgrounders) (Section Winner); 2, P. Underwood (Sandgrounders); 3, J. Baldwin (Sandgrounders). Junior Livebearers: 1 and 3, E. Corbett; 2, D. Stephenson (Merseyside). Junior Goldfish: 1, G. Lawless (Leigh); 2, R. Patterson (Merseyside); 3, R. Underwood (Sandgrounders).

Section M—Breeders—Livebearers C. and D: 1, Mr. and Mrs. Goddard (Macclesfield); 2, P. Harris (St. Helens); 3, S. Tomlinson (Macclesfield). Egg-layers C. and D: 1 and 3, D. Hulse (Oldham) (Section Winner); 2, R. Rowlands (Sandgrounders). Egg-layers A. and B: 1 and 3, K. Buckley (Bridgewater); 2, A. Carter (Stratford). Breeders Goldfish: 1, M. Raugh (Leigh).

Section N—Mini Jaws: 1, Mr. and Mrs. Collier (Stratford); 2, Mr. and Mrs. Stevenson (Woodside); 3, P. S. and A. Hopwood (Darwen). Mini Jaw Novity: 1 and 2, F. S. and A. Hopwood (Darwen) (Section Winner); 3, Mr. and Mrs. Goddard (Macclesfield).

Section O—Common Goldfish: 1, Mr. and Mrs. Waterhouse; 2, G. Lawless; 3, G. Airey. Single Tail Goldfish: 1, M. Raugh (Leigh); 2, S. Almonough; 3, J. Lynch (Merseyside). Twin Tail Goldfish: 1, Mr. and Mrs. Harvey (Sandgrounders) (Section Winner); 2, T. Philcock (Runcorn); 3, Mr. and Mrs. Colley (Oldham). A.O.V. European Goldfish: 1, Mr. and Mrs. Underwood; 2, Mr. and Mrs. Colley; 3, J. Marsh (Stem). A.O.V. Goldfish: 1, J. Lynch; 2, D. Harvey (Sandgrounders); 3, T. Philcock.

Best Fish in show: spotted climbing perch, Mr. and Mrs. Underwood.

Best Breeders: D. Hulse.

Best Goldfish: Mr. and Mrs. Harvey.

Leigh Member most points: Mr. and Mrs. Waterhouse.

Leigh Junior most points: G. Lawless.

570 entries, 53 Classes.

FEDERATION OF NORTHERN AQUARIUM SOCIETIES

Show League Results. Number of Firsts, Seconds, Thirds and Points:

Sandgrounders 22, 13, 14, 106 points. Leigh 9, 4, 5, 60 points. Bridgewater 5, 8, 6, 37 points. Merseyside 6, 5, 6, 34 points. Darwen 3, 4, 2, 19 points. St. Helens 1, 5, 2, 15 points. Woodside 0, 4, 2, 10 points. Oldham 1, 2, 2, 9 points. Runcorn 1, 2, 2, 9 points. Macclesfield 2, 0, 2, 8 points. Stratford 1, 1, 1, 6 points. Hyde 0, 1, 2, 4 points. Northwich 0, 1, 0, 2 points. Skarn 0, 0, 2, 2 points. Warrington 0, 1, 1, 2 points. Lyndhurst School 0, 0, 1, 1 points. Total 903.

Keighley A.S. Show results: Platos: 1, G. Clarke (BBC, Thorne); 2, R. and S. Cherryhouse (Ind.); 3, Mr. and Mrs. Hill (Burnley). Sharks and Foxes: 1, Mr. and Mrs. Kemp (Sheaf Valley); 2, M. and L. Price (Rochester); 3, Mr. and Mrs. R. K. Shaw (Ayrborough). Class 12: 1, Mr. and Mrs. Lake (S. Hunsford); 2, Clarke Bros. (Potteries and Dist.); 3, Mr. and Mrs. J. Riley (Leeds P.O.). 14: 1 and 2, Miss L. Mottershead (Bradford); 3, Mr. and Mrs. Copley (Doncaster). 11: 1, E. L. Waley (Barnsley); 2, G. Clarke; 3, G. Frisby (Wyke). 15: 1, Mr. and Mrs. Richardson (Sheaf Valley); 2, Clarke Bros.; 3, Mr. and Mrs. Copley. 21: 1, D. Barrett (BBC, Thorne); 2, Mr. and Mrs. Smith (Zastin); 3, R. and S. Cherryhouse. 31: 1, G. Clarke; 2, D. Barrett; 3, Mr. and Mrs. Hill. 32: 1, 2 and 3, Mr. and Mrs. Phoebe (Ashfield). 37: 1, John Shafford (Barnley); 18: 1 and 3, M. and L. Price; 2, Mr. and Mrs. Hill. 34: 1, Miss A. Stansfield (Sheaf Valley); 2, Miss L. Robert (Nelson); 3, T. Phillips (Hudd). 36: 1, Judith Cooke (Ayrborough); 2, N. Metcalf (Wyke). 39: 1, Robinson and Pickles (Keighley); 2, N. Metcalf; 3, Mr. and Mrs. Davies (Doncaster). 10: 1, Mr. and Mrs. Kemp; 2, R. and S. Cherryhouse; 3, Mr. and Mrs. Smith. 13: 1 and 2, Clarke Bros.; 3, Mr. and Mrs. Shaw (Ayrborough). 10: 1, Mr. and Mrs. Lake; 2, Mr. and Mrs. Daines (Doncaster); 3, Woodbank and North (Moorcambe Bay). 21: 1, Mr. and Mrs. Daines; 2, Mr. and Mrs. Smith; 3, Mr. and Mrs. Barlow (Sheaf Valley). 17: 1, Mr. and Mrs. Kenworthy (Ayrborough); 2, J. Roberts (Nelson); 3, Mr. and Mrs. Lane. 31: 1 and 2, Clarke Bros.; 25: 1, 2 and 3, B. Banks (BBC, Thorne). 29: 1, Mr. and Mrs. Lane; 2, K. Buckley (Bridgewater); 3, Mr. and Mrs. W. Allen (Chatterfield). 20: 1, Mr. and Mrs. Daines; 2, Mr. and Mrs. J. Riley; 3, Mr. and Mrs. Copley. 6: 1, F. S. A. Hopwood

(Darwin); 2, Mr. and Mrs. Kemp; 3, Mr. and Mrs. J. Riley. 31: 1, B. Banks; 2, S. Simpkins (Sheaf Valley); 22: 1, K. M. Fisher (Ashfield); 2, B. Lydon (Keighley); 3, Mr. and Mrs. Phoebe. 31: 1, A. Mearns (Ashfield); 2, M. Stated (Sheaf Valley); 3, Clarke Bros. 24: 1, B. Banks; 2, Mr. and Mrs. Hill. 23: 1, Mr. and Mrs. Smith; 2, T. Tubbart (Wyke); 3, E. L. Waley (Barnsley). 20: 1, Mr. and Mrs. K. Alford (Ashfield); 2, A. D. Fisher (Bradford); 3, R. and S. Cherryhouse. 2, Mr. and Mrs. Walter (Chatterfield); 3, Mr. and Mrs. Lake. 19: 1, Mr. and Mrs. Barlow (Sheaf Valley); 2 and 3, M. A. Hollinsworth (Sheaf Valley). 18: 1, R. Brown (Moorley); 2, F. S. A. Hopwood; 3, B. Banks.

Wyke Show Society had Mr. C. Firth, the Senior Fisheries Inspector, to give a very interesting talk and slide show about his work on controlling fish stocks in the rivers and ponds. Table show results: Seniors: 1, R. Laverick; 2, A. Dudding; 3, Mr. and Mrs. Ashby. Juniors: 1, S. Croshaw; 2, R. Laverick; 3, T. Gould. Fish of the night: Pairs, Livebearer: 1 and 3, Mr. and Mrs. Frisby; 2, Timmy Edge.

The club held their meetings at "The Rose" public house, Beestly Road, Hall at 7.30 p.m. on the 2nd and 4th Thursday of each month. Visitors and new members all welcome.

RESULTS of the Merseyside A.S. annual open show held at Rainhill Village Hall on 27th April.

Key to Societies: (M) Merseyside; (BR) Bridgewater; (L) Leigh; (SH) St. Helens; (LP) Leeds P.O.; (H) Haydock; (BL) Blackpool; (SG) Sandgrounders; (D) Darwen; (SK) Skelmersdale; (MA) Macclesfield; (W) Woodside; (WA) Warrington; (NS) North Staffs; (N) Northwich; (R) Runcorn; (LE) Liverpool L.F.S.

Guppies: 1, A. and E. Berry (BR); 2, Mr. and Mrs. Williamson (L); 3, J. Lester (M). Pomatois: 1, G. Brown (M); 2, P. Harris (SH); 3, K. Corbett (M). Mediums: 1, Mr. and Mrs. Iddon (SG); 2, M. Allison (SG); 3, K. Pilkington (M). Swordtails: 1, Mr. and Mrs. Riley (LP); 2, S. McNeil (H); 3, Mr. and Mrs. Casey (BL). A.O.V. Livebearers: 1, P. Harris (SH); 2, Mr. and Mrs. Yates (D); 3, P. Harris (SH). Small Characins: 1, B. Wilson (SK); 2, J. Lynch (M); 3, P. Kynyon (SG). Large Characins: 1, R. Payne (M); 2, Mr. and Mrs. Underwood (SG); 3, Mr. and Mrs. Yates (D). Rainbows: 1, Mr. and Mrs. Tomlinson (MA); 2, J. Watters (M); 3, Mr. and Mrs. Underwood (SG). Small Barbs: 1, 2 and 3, Mr. and Mrs. Baldwin (SG). Large Barbs: 1, M. and N. Rimmer (SG); 2, Mr. and Mrs. Underwood (SG); 3, Mr. and Mrs. Stevenson (W). Linnies A.V.: 1, Mr. Underwood (SG); 2, P. Kynyon (SG); 3, D. Harvey (SG). Dwarf Cichlids: 1, J. Corbett (M); 2, Mrs. Waterhouse (L); 3, Mrs. Underwood (SG). Large Cichlids: 1, 2 and 3, Mr. and Mrs. Underwood (SG). Angels: 1, Mr. and Mrs. Stevenson (W); 2, D. and G. Moseley (L); 3, G. Lawless (L). Rift Valley: 1, B. Wilson (SK); 2, Mr. and Mrs. Weaver (WA); 3, G. Lawless (L). Fighters: 1, Mr. and Mrs. Riley (LP); 2, Mr. and Mrs. Iddon (SG); 3, Mrs. Norton (SG). Small Anabantids: 1, Lynch (SG); 2, A. and E. Berry (BR); 3, G. J. Livingston (NS). Large Anabantids: 1, Mr. and Mrs. Underwood (SG); 2, S. Waterhouse (L); 3, K. Corbett (M). Killies: 1, A. and E. Berry (BR); 2, D. and G. Moseley (L); 3, Mr. and Mrs. Yates (D). Loaches and Bories: 1, Mr. and Mrs. Underwood (SG); 2, F. S. A. Hopwood (D); 3, R. Payne (M). Sharks and Foxes: 1, Mr. and Mrs. Stevenson (W); 2, H. Buckley (N); 3, Mr. and Mrs. Goddard (MA). Corydoras and Brochis: 1, Mr. and Mrs. Baldwin (SG); 3, L. Fountain (R). A.O.V. Catfish: 1 and 2, Mr. and Mrs. Underwood (SG); 3, Mr. and Mrs. Baldwin (SG). Livebearers (Pairs): 1, J. Corbett (M); 2, P. Harris (SH); 3, Mr. and Mrs. Riley (LP). Egg-layers (Pairs): 1, Mr. and Mrs. Underwood (SG); 2, Mr. and Mrs. Rimmer (SG); 3, R. Carter (SH). A.O.V. Tropical: 1, Mr. and Mrs. Riley (LP); 2, Mr. and Mrs. Baldwin (SG); 3, B. Steadman (R). Breeders Livebearers (1-10): 1, Mr. and Mrs. Goddard (MA); 2, G. Airey (L); 3, Mr. and Mrs. Yates (D). Breeders Egg-layers (1-10): 1, R. Brown (M); 2, P. Harris (SH); 3, D. Wilson (LE). Breeders Egg-layers (11-20): 1, Mr. and Mrs. Waterhouse (L). Common Goldfish and Comets: 1, E. Seymour (M); 2, Mr. and Mrs. Waterhouse (L); 3, G. Lawless (L). Shubunkins: 1, J. Lynch (M); 2, N. Woodhead (H); 3, Mr. and Mrs. Casey (BL). A.O.V. Fancy Goldfish: 1, D. Harvey (SG); 2, G. Philcock (R); 3, J. Lynch (M). A.O.V. Goldfish: 1, J. Lynch (M); 2, D. Harvey (SG); 3, C. Philcock (R). Mini Jaws: 1, 2 and 3, F. S. A. Hopwood (D). Juniors A.V.: 1 and 3, K. Corbett; 2, P. Underwood (SG). Best in Show: B. Wilson (Rift Valley).

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

JUNE

1st June: Loughborough & District A.S. open show at the Barleigh Community College, Thorpe Hall, Loughborough. Schedules from Mr. L. S. Parry, Show Secretary, 10 Cleveland Road, Loughborough, Leics. LE11 2SP.

1st June: Accrington & District A.S. open show at Aspley Methodist Church Hall, Blackburn Road, Accrington. Details from Secretary Ian Barwell, 30 First Avenue, Church, Accrington (Tel: Accrington 384342).

1st June: Mid-Sussex A.S. invitation inter-club, Sidney West Sports Centre, Laylands Road, Burgess Hill, West Sussex. Information from Show Sec. T. Tanner, 19 Cypress Road, Burgess Hill, West Sussex RH15 8DX (Tel: Burgess Hill 43202).

1st June: Redcar A.S. open show at the Coatham Memorial Hall, Coatham Road, Redcar. Benching 12-2 p.m. Details and schedules from the secretary, D. Readman, 1 Lovett Avenue, Redcar, Cleveland TS10 5BR.

1st June: Arbroath A.S. open show at the Community Centre, Markings, Arbroath. Details from John Stevens, 95 Beech Road, Arbroath (Tel: 0241 79607).

7th June: Sudbury A.S. open show at St. John's Church Hall, Crawford Avenue, Wimbly, Middx. from 8 a.m.-4 p.m. Schedules from L. J. Brazier, 66 Ormsley Way, Kenos, Middx. (Tel: 01-204 5370).

8th June: Northwich & District A.S. open show at Hartford High School, Greenbank Lane, Chester Road, Northwich, Cheshire. Further details from Show Sec. D. Valentine, 45 Hartford Road, Davenham, Northwich, Cheshire (Tel: Northwich 6624).

8th June: Zetish A.S. open show at the Park Community Centre, Ferry Road, Scarborough. Details from Show Sec. A. Smith, 71 Sutton House, Scarborough.

8th June: Whitby & District A.S. open show at the Sea Pavilion, Whitby. Schedules from Don Forbes, 12 Lockton Road, Whitby, N. Yorks.

8th June: Fancy Guppy Association, North West Lancashire and Manchester section open show. Benching times, venue and schedules from Show Secretary, 1, Haworth, 82 Auden Terrace, Plantation Street, Accrington, Lancashire.

9th June: East Dulwich A.S. table show. Classes E, Ea, B, at Dulwich Bath Reception Hall, London, S.E.22. Start 8.30 p.m. New members welcome. Phone: 699 3122 for further details.

10th, 14th, 15th June: Three Rivers Aquarist Fobkeeping Exhibitions at the Crowtree Leisure Centre, Crowtree Road, Sudbury. For further information contact G. Liddle, 17 Palmerston Avenue, Walkers, Newlands upon Tyne.

12th, 14th, 15th June: Tyne-Tees Area Association of the F.B.A.S. open show at the Sports Centre, Silchester Road, Bolton. Enquiries to B. Rodwell, 4 Whalley Road, Hale, Cheshire.

15th June: Salisbury & District A.S. open show at the Activity Centre, Wilton Road, Salisbury. Over 40 classes, including six cichlid classes and eight coldwater classes. Schedules from R. P. Adams, 26 Empire Road, Salisbury (i.e. phone), or ring 01223-25360.

15th June: British Koi-Keepers society Northern Section open show at Tatton Park—change of date from 6th July.

15th June: Dunsmuir & District A.S. show cancelled. A show planned for next year.

15th June: Swillingham A.S. open show at the Community Centre, Main Street, Garforth. Schedules from D. Curtis, 158 Sandgate Drive, Kippax, Leeds Yorks. LS25 7QR. (Tel: 0532-664114).

19th June: Catfish Association of Great Britain (Berkshire Area Group) meeting at the "Barley Mow", Abingdon. Mike Sandford will give lecture on "What is a Catfish?" Visitors welcome. Contact Les Hart on Thatcham 66966.

21st June: South Park Aquatic (Study) Society coldwater open show at Wimbledon Community Centre, St. George's Road, Wimbledon. Schedules from Show Secretary, L. B. Clipp, 16 Overhill Way, Beckenham, Kent (Tel: 01-650 6954).

22nd June: Havant & District A.S. open show is at the Horndean Community Centre, Horndean. Schedules from H. Armitage, 74 Park House, Farm Way, Leigh Park, Havant, Hants. (Tel: Havant 473192).

22nd June: Alfreton & District A.S. open show at Alfreton Hall.

22nd June: The Birmingham Section of the British Koi-Keepers Society 2nd national Koi auction and show at the Botanical Gardens, Edgbaston, Birmingham from 10 a.m. Sale 2 p.m. Details from Mrs. G. Minchin, 26 Arcadia Road, Bourneville, Birmingham B30 (Tel: 021-472-0661).

28th June: St. Helens A.S. open show at Rainhill Village Hall.

28th June: South Shields A.S. 9th annual open tropical fish show.

28th June: Sherwood A.S. open show at the Lady Margaret's Hall, Hylbeck Wirren. Trophies for all section winners, plus 1, 2, 3 and 4 cards. Unique Robin Hood wall plaques for all 30 classes. Schedules from M. A. Hollingsworth, 9 Vesper Court, Forest Town, Mansfield, Notts. NG19 0AN. (Tel: Mansfield 641492).

JULY

5th July: Nailsea & District open show at Clevedon Community Centre. Details from Show Sec. P. Fincham, 2 Woodland Road, Nailsea, Bristol, Avon (Tel: 0272 853096).

8th July: Kings Lynn A.S. open show at the Corn Exchange, Tuesday Market Place, Kings Lynn. Schedules later from secretary, Jan Fowler, 35 Russell Close, Kings Lynn.

8th July: Chard & District A.S. 6th annual open show at Farnham School, Chard Somerset. Details from A. Griffin, 24 Thornton Road, Yeovil, Somerset (Tel: Yeovil 23231).

8th July: South East London A.S. open show at West Greenwich Community Centre, 141 Greenwich High Road, S.E. 10. Details from Show Sec. Colin Osborn, 84 Gould Road, S.E. 7. (Tel: 018 9681-691 0283).

8th July: The Midland Koi Association and the United Kingdom Chapter of Zen Nippon Aikikai will together be holding their first national open Koi show at Twycross Zoo, Leicestershire. Details from U.K. Chapter, P.O. Box 30 Windsor Street, Uxbridge, Middlesex.

8th July: N.O.V.O. T.F.C. open show at Heaton School, Newton Road, Heaton, Newcastle-on-Tyne. Schedules from Show Secretary J. English, Henderson Filters, Thackley.

8th July: Midland Koi Association and the U.K. Chapter of Zen Nippon Aikikai will together hold their first national open Koi show at Twycross Zoo, Leicestershire. Show details from R. Cassar, 8 Swinburne Road, Mill Hill Estate, Hinxley, Leics. LE10 1TQ.

8th July: Lorne Aquarist open show.

12th and 13th July: Rensford & Beacontree A.S. open show (Dagenham Town Show), Central Park, Dagenham. Schedules (May), Garry Steptoe, 35 Coniston Way, Elm Park, Hounchurch, Essex RM12 5EH.

13th July: Scarborough & District A.S. open show at Gladstone Road Junior School, Wooler Street, Scarborough. Schedules (April) from J. P. Richardson, 5 Keld Garth, Pickering, W. Yorks. YO18 8DG (Tel: Pickering 33964).

13th July: Lytham A.S. 14th annual open show at Lytham Baths, Dicconson Terrace, Lytham. Details from Show Sec. Peter Ham, 1 Wyndale Grove, Frodsham, Prescot, Lancs. PR4 1DE (Tel: Frodsham 633182 or 635221).

13th July: Stockton-on-Tees A.S. 15th annual open show at the Dovecot Art Centre, Dovecot Street, Stockton-on-Tees. Further information from E. Clark, 55 Durham Road, Stockton-on-Tees, Cleveland.

28th July: Snodgrass A.S. 10th open show at Meols Cop School, Meols Cop Road, Southport. More than 30 trophies; plaques for each class winner. Inquiries to Mr. B. Baldwin, show secretary, 10 Olive Grove, Southport, Merseyside PR8 6BG. (Tel: 0704 43384).

AUGUST

2nd August: Blackpool & Fylde A.S. open show at Kemtengs Hall, Newton Drive, Blackpool.

4th-9th August: Portsmouth A.S. annual exhibition at the Wesley Central Hall, Preston Road, Portsmouth.

10th August: Grimsby & Cleethorpes A.S. open show at the Memorial Hall, Cleethorpes. Benching 12-2 p.m. Show schedules from Mrs. B. Mathews, 15 Swais Road, Humberston, Nr. Grimsby, South Humberside (Tel: 0472 814436).

10th August: Oldham & District A.S. open show at Werneth Park, Oldham. Benching 12-2 p.m. Trophies for all class winners plus prizes for 1, 2, 3, places. 31 Tropical, 10 coldwater sections plus furnished mini jars. Schedules from A. Chadwick, 9 Bromville Close, Chadderton, Oldham, OL1 2RH (Tel: 061-652 6207).

15th August: Northern Goldfish and Pondkeepers Society 4th open show at the Sports Centre, Silchester Road, Bolton. Enquiries to B. Rodwell, 4 Whalley Road, Hale, Cheshire.

17th August: Cheltenham Tropical Fish Club open show at St. Mark's Community Centre, Havers Way, Cheltenham. Schedules from M. Jenkins, 3 Marlborough Place, Prince's Street, Cheltenham (i.e. phone).

20th August: Long Eaton Aquarist open show at Gregory's Rose Garden Toton.

20th August: Floorwood and District A.S. first open show.

24th & 25th August: Exhibition 80 by Great Yarmouth & District A.S. at Hopton Village Hall (on A12 between Gt. Yarmouth and Lowestoft). Tropical and coldwater fish, taboos, etc.

31st August: North Wiltshire A.S. annual open show (change of date). Further details and Show schedules will be available later. Show Secretary, P. Taylor, 7 Ridgeway Road, Stratton St. Margaret, Swindon, Wilts. (Tel: 0793 824114).

31st August: Nuneaton A.S. open show. Schedules from Show Secretary G. Hemmings, 152 Tomkinson Road, Nuneaton, Warwickshire (Tel: Nuneaton 325271).

SEPTEMBER

7th September: North Wiltshire A.S. open show. Further details from secretary, G. Reynolds, 29 Mansell Way, Wootton Bassett, Swindon, Wilts. (Tel: 0793 812107).

7th September: Huddersfield Tropical Fish Society open show at Slaidwaine Civic Hall. Show secretary, Mrs. P. Town, 187 Abbey Road, Shipley, N. Huddersfield. (Tel: Kirkstall 7640).

7th September: Bethnal Green A.S. open show. Show Secretary, S. J. Stubblings, 3 Munton Road, Clapton, London E5 9LH.

7th September: Middlesbrough & District A.S. open show at the James Finnegon Hall in Eton. Inquiries to Show Sec. D. Roddam, 40 Station Street, North Ormsby, Middlesbrough, County Cleveland.

7th September: Wellingborough & District A.S. open show at Westfield Road Boys School, Birch Hill Road, Wellingborough, Northants. Show schedules from Show Secretary, A. J. Crew, 67 Swinbourne Road, Wellingborough, Northants (Tel: 677131).

13th September: Bristol A.S. open Coldwater show at St. Ambrose Church Hall, Stymond Road, Whitshall, Bristol 5. Schedules from W. G. Ham, 18 Imperial Road, Bristol BS14 9ED (Tel: 0272 776924).

13th September: Hounslow & District A.S. open show at the Youth Centre, Cecil Road, Hounslow. Information and schedules from Show Secretary, Mr. T. Bellingbrooks, 2 Holmwood Close, Addlestone, Surrey (Tel: Weybridge 54916).

13th September: Merthyr A.S. open show at Rhydyar Leisure Centre, Merthyr Tydfil.

14th September: Harlow A.S. open show at Moor Hall, The Snow, Harlow. Details from Dave Henman (Tel: White Roding 275) or Peter Mandich (Tel: Ripping 72214).