

AUGUST 1973

20p

Pet **Fish**

monthly

The PRACTICAL FISHKEEPING MAGAZINE



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Quietesting Noisy Pumps

Marinist's Notebook

Coloration in Fishes

Goldfish Rearing

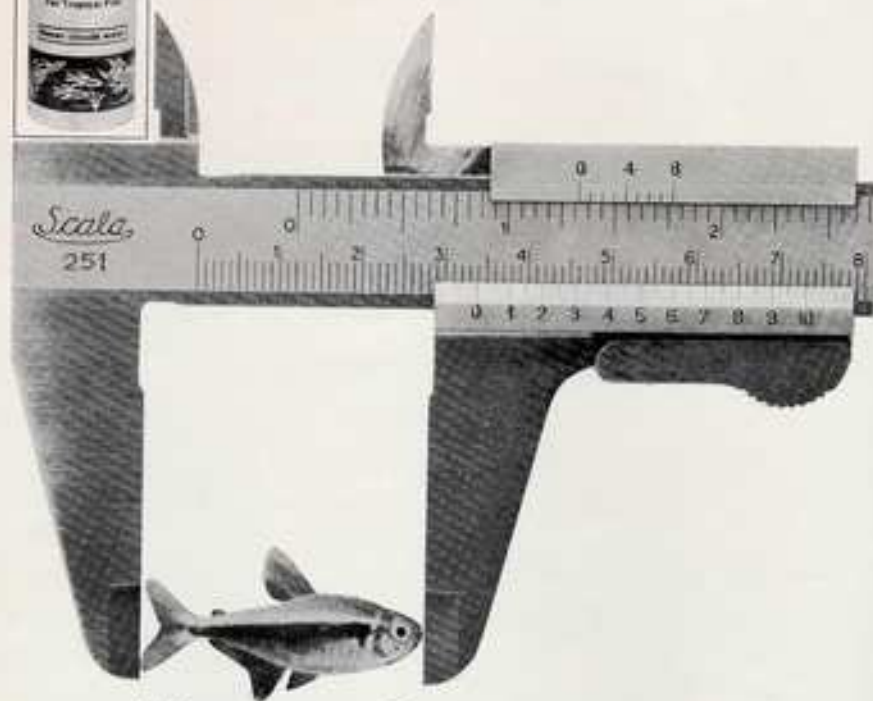
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Comments and Quotes

- Preoccupation with size of fishes
- Loss of distinguished American aquarist

How Big?

ONE aspect of fish lore that appears to be as much a preoccupation of aquarists as it is with anglers concerns the maximum size of a given species. Observe the groups in animated discussion at any aquarium society show and you will see the familiar gesture repeated over and over again—forearms parallel to the floor, hands facing palms inwards and separated by a distance alleged to represent the length of some aquarium denizen not usually itself in evidence. This preoccupation is, of course, inevitable among the showing fraternity since 'points for size' are related to a desired maximum size of a show specimen, based on some concept of the maximum that the species should reach. Voices are constantly heard yearning for more information about these sizes, and it is quite obvious that what is expected is that there should be some kind of manual (a type of Ford-owner's manual seems to be envisaged) that would specify for each fish ('model?') a precise attainable length. This is, of course, an impossible notion.

Like Dad's Army, any group of animals contains the long, the short and the tall, and to make the 'Lofties' ('Lengthies' for fish?) the yardstick for the others is not doing justice to the species, to say the least. 'Length reached in the wild state' is a magic formula for some people with the Ford car approach to fish lengths, but in fact fish in the wild are likely to be subject to factors causing even greater variation of measurements and hence alteration of the average size. Average length under best aquarium

conditions in many instances might well prove to be above average length for the wild fish. Although there is no directly predictable relationship between age and size where fishes are concerned, since well-kept aquarium specimens of many types almost certainly attain greater ages than fishes in their native waters there is that much greater likelihood of the tank fish achieving the best size within its capability. But we see no sense at all in preoccupation with size, particularly where development of that feature to an admired extent has involved some technique that is over and above usual fishkeeping practice. Come to think of it, on these grounds there could be a case for penalising some of the big 'uns seen at shows.

Dr Earl S. Herald

IT is with regret that we report the death of the distinguished American aquarist and marine biologist Dr Earl S. Herald. Curator of the famous Steinhart Aquarium in San Francisco, a position he had held for many years, Earl Herald had been a particular asset to aquarists-keeping in the U.S.A. by his interest in writing about fishes for aquarists in books and American journals, especially in the now defunct THE AQUARIUM JOURNAL. His book *LIVING FISHES OF THE WORLD* was published in Britain in 1961. It is reported in THE SALT WATER AQUARIUM MAGAZINE that Earl Herald died whilst underwater Scuba diving off Baja, California in search of a rare pipe-fish.

BREEDER'S RECORD

Spawning the Semi-tropical Medaka

By A. B. BRITTON

THE golden medaka or Japanese rice fish (*Oryzias latipes*) is a semi-tropical fish probably not much seen at the average dealer's shop. I bought two, which turned out to be a pair, from the coldwater dealer's stall in Cambridge market one February day. The temperature of the water must have been in the forties or low-fifties (°F). I had not read anything about these fish in the literature, so I didn't know what temperature would suit them best.

Only having tropical tanks available, I immersed the plastic bag in a tank at 75°F, very foolishly, for the difference in temperature from the marketplace must have been enormous. The smaller one showed considerable discomfort and stood on its head. However, in a quickly-prepared unheated tank (68°F) they soon looked happier, although I suffered some qualms about my folly. In a few days they were acclimatised, proving they were hardy creatures. They ate flake food, hard-boiled egg (the yellow part only, of course), scrambled egg and scraped beef.

They were a delicate pale gold in colour, slender and nervous, taking refuge in the corner of the tank when I took the cover off. Gradually the female began to look fatter and darker gold than her more lemon-coloured mate. In May there were eggs all over the floating plants I had spread over the surface, but I didn't know whether the pale-looking male was fertilising them. I have never seen any spawning behaviour at all but I have often seen a cluster of golden eggs protruding from the female. I have seen her eating the eggs, too, sometimes looking rather embarrassed with a string of them coiled round her mouth and unable to cope with ordinary food for some time.

From the plants removed from the parents' tank, about 100 tiny babies hatched out more or less at once. With Liquifry and Tetramin Baby Food they thrived for a time and then began to die off. When nearly all had died I realised that the fine food could be suffocating them, especially in a small container. I also began to think they needed some heat, as by now our central heating was off for the summer. When nearly all of them had faded away I discovered two fairly big ones, much larger than any of the main batch, swimming about quite happily in a bucket that I use to dump snails in, kept over the gas-stove in the kitchen and

therefore quite warm. I feed this semi-wild collection of snails only every week or so with a pinch of Tetramin so that the water has remained crystal-clear for years. This gave me the clue that the babies needed some heat and no Liquifry.

So when the next seventy or so hatched out I put them in a plastic bucket with heating up to 72°F, aeration, no Liquifry and fine hard-boiled egg yellow and Tetramin Baby Food four times a day. Nearly all survived. Now I have 35 with the parents and about 35 on their own with two X-ray fish, who had been bullied by tiger barbs and needed a refuge. Both tanks are heated up to 78° and the parents seem quite happy now at this temperature. I have had the young-only tank as high as 86°F once by mistake without any apparent signs of discomfort.

The mother is now a very handsome and respected matriarch, a little over 2 in. long, apricot-gold on the top and silvery nearer the tummy. I have watched her in the summer, when the sun is on the tank, lying lazily on the top of the floating plants as if sunbathing, while the currents from the airstone wafted flakes of food into her mouth, like Nero eating grapes. She is a bit curmudgeonly now, sometimes cross with her growing brood if they get in her way at feeding time and chasing them away. I have no evidence that she eats her newly hatched young but, having only very rarely found newborn fry in her tank, it is quite likely that she does. Her docile, paler mate has never really put on much weight, although he has kept pace with her in length. He is never aggressive at feeding time but discreet and polite.

The dealer told me that his medakas had shown a tendency to jump when he netted them for customers. But the only time any of mine has jumped is when the female leapt out of a bucket into the bath, when I was cleaning the tank in another room. The bath-plug was unfortunately too small and was letting the water out slowly, so that, when I came into the bathroom, she was sitting on her tummy in the swimming position on more or less dry land. I floated her off, she seemed

Continued on page 176

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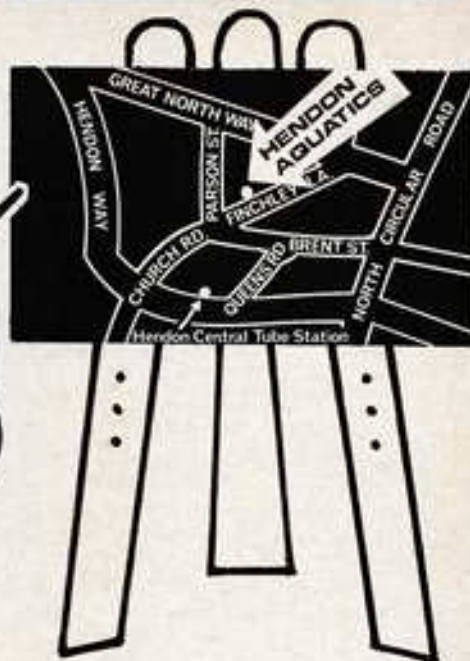
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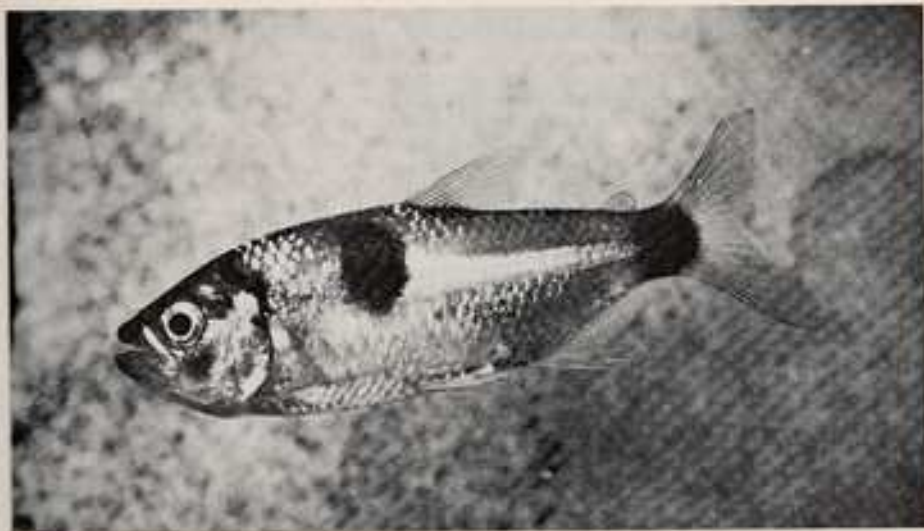
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The Playful *Exodon paradoxus*

By BRAZ WALKER

Photograph by the author

THE small members of the family Characidae, which we know in the hobby as 'tetras', comprise a fantastic array of colours, sheens, tones, patterns and habits and at least a few of their members are familiar to virtually every tropical fish keeper. The familiar cardinals, neons, lemons, glowlights, black tetras and a score of others would, if suddenly withdrawn from our aquaria, leave a void that could hardly be replaced, for these are the active, colourful schooling fishes which form much of the backbone and attractiveness of aquarium keeping.

One of the lesser known tetras, and certainly one of the most strikingly beautiful, is *Exodon paradoxus*. In form it is quite typical of the group, and is immediately recognisable to the initiated as a tetra. The body colour is bright yellow, especially above, and the tail is also yellow with reddish tips. The tip and middle portion of the dorsal are red, the ventrals are mostly bright red and the anterior part of the anal fin is orange to red. The sides are adorned with two large, jet-black spots,

one just beneath the front dorsal rays just at midside and the other just at the root of the caudal fin or tail base. Connecting these two intense and striking spots is a bright silver band, which in reflected lights shines in iridescent hues that vary according to the quality and positioning of the light. In Nature, *Exodon paradoxus*, like many of its relatives, swims in very large schools, and in the aquarium it is quite active, moving almost ceaselessly. There is a malevolent playfulness about the creature which is reminiscent of Till Eulenspiegel, the character of German folklore and subject of the Richard Strauss tone poem of the same name (*Till Eulenspiegel's lustige Streiche* or *Till Eulenspiegel's Merry Pranks*). Strangely enough, the fate of *Exodon* is often not dissimilar to that of Till, whose practical jokery at last led him to the gallows.

While hanging a fish is obviously an impractical idea, 'hanging' in this case may mean being relegated to an out-of-the-way aquarium where little harm can be committed, being given away or

otherwise disposed of for the welfare of the other fishes involved, for *Exodon*, despite its beauty, can at times be a relentless tormentor of other free swimming fishes, playfully chasing and nipping them, often until they are seriously damaged. Whereas the fishes which we know as tetras are characteristically equipped with teeth, this beautiful but often ill-mannered fish has better dental equipment than most and has no reluctance to use it in its prankish games.

Breeding has reportedly been successful in the aquarium, with typical hard-driving performance on the part of the male and the eggs being deposited on bushy or fine leaved plants. As with many other characids, females are usually larger and more robust and are not hard to determine in comparison to the more slender males at maturity.

The scientific name of the fish, *Exodon paradoxus*, means literally: *exo*—out, *odon*—tooth; *paradoxus*—a paradox. *Exodon* refers to the fact that both jaws have forward projecting tooth structures, although this is not true of all the teeth.

Few who have seen this fish at its best will not concede that it is among the most beautiful of freshwater aquarium fishes, and those who would not completely agree must certainly place it high within its own family at least, and this particular group suffers no poverty of beauty. The fish is unlikely, however, ever to attain great popularity because of its nature and the frustration created by its ceaseless disruptions to an otherwise peaceful aquatic scene. A shoal of mature specimens in a large and well-planted aquarium would be a beautiful sight, and as with some of the popular barbs of the family Cyprinidae, an increase in their numbers often seems to reduce their 'nippy' attitude toward their tankmates. It is possible that a large shoal in a large aquarium might present fewer problems.

As far as requirements of feeding, water conditions and other ordinary considerations are con-

cerned, there could hardly be an easier fish to provide for. Live foods are, of course, preferred, but almost any frozen, freeze-dried, flake or dried food will be eagerly accepted, and the fish will thrive. A wide range of water conditions, avoiding extremes, is easily tolerated without noticeable effects, and temperatures between 65 and 85°F (18-29°C) are entirely suitable, although the mid-70s is better for extended periods, with the extremes of the range mentioned being best reserved for temporary situations. Certainly in Nature fishes go through rather wide temperature fluctuations and this is very likely of some benefit to them rather than being maintained year-round at constant temperatures. It should be remembered that fishes are usually relatively crowded in aquaria, and at higher temperatures ample aeration should be provided.

Exodon paradoxus is found in South America from Guyana to Brazil, and in Nature reaches a quite respectable size of around 6 in. In the aquarium, 4 in. is quite a large specimen.

Considering the tremendous number of innovations which the aquarium hobby has seen in the last few years, the advances in breeding techniques, maintenance and every other aspect of fishkeeping, I feel that the day will come when fishes such as this, which are lovely and desirable in appearance but less so in disposition, will be maintained in aquaria without the problems of compatibility which they sometimes present today. In the meanwhile, it is certainly worthwhile working with them in experimental situations such as keeping them with other fishes well able to take care of themselves.

Although not a fish for everyone, *Exodon paradoxus* can be kept satisfactorily and bred successfully. Its tenacity, endurance and beauty are exceptional, and it is a worthy acquisition and a challenge to the aquarist who appreciates something a bit out of the ordinary.

Spawning the Medaka

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quite unconcerned and was laying eggs the next day.

As the medaka inhabits paddy-fields it is probably a shallow-water fish and seems to keep rather to the surface, although it does forage on the bottom on occasion. This tendency to be at the top of the tank means that the medaka is probably not a good fish for public display aquaria. However it is a charming fish, with lime-green eyes when young,

not in the least aggressive (except for my pompous matriarch) and very hardy. It is an odd thing that I haven't yet seen a really good picture of the golden medaka. The one in Hervey and Hems' FRESHWATER TROPICAL AQUARIUM FISHES I would not call a good likeness, completely missing the angularity of the profile, and the pointed beak, which is accentuated as the fish matures. Seen from the top and from a distance the juveniles look very like animated date-stones, and from the top the adult fish have a much more rounded look than in profile.

I have not tried white cloud mountain minnows with mine but I imagine they would do well together, as would the peacock-eyed bass and any other small semi-tropicals.

COLDWATER SCENE



By FRANK W. ORME

Goldfish Rearing and Pond Care in AUGUST

YOUR young goldfish should now be large enough for you to see the body and finnage shape easily and the final selection can be made to pick out those specimens which you consider worth growing on for breeding and show purposes. If you have not already done so I would suggest that you obtain a copy of the Goldfish Society of Great Britain Show Standards, in which are depicted the outlines of the ideal goldfish (these booklets are advertised in the classified advertisement section of PFM). Study the outlines carefully, so that you know exactly what points you are looking for.

You must remember, however, that the young fish is still not fully developed. The fins will continue to grow and the scaled varieties may still not have changed from the wild colour into the final coat of gold, nevertheless it will be possible to pick out those fish with obvious faults such as bent or twisted fins.

Points to Look For

If you are breeding the nacreous varieties, all metallic and pink fish should be discarded, unless you intend using them for a matt-metallic spawning later. Basically, the following points should be looked for.

Veiltails and fantails. The body should be of good depth with an even curve from head to tail on both dorsal and ventral surfaces. Finnacle should be carried proudly without any trace of twisting, folding or floppiness. The anal fins must be paired, evenly matched and fully divided; the tail or caudal fin must also be divided, both halves being equally matched. In the veiltail the fin should be broad and as square as possible; the fantail should carry a short, stiffly held forked tail.

Blackmoor. The same points as mentioned for the above two varieties must be present, although in the main the veiltail type is preferred. In addition the eyes should protrude and be of equal development. A really good specimen's colour should appear as a matt velvet black, without trace of brassiness, and this colour should be carried fully into all fins.

Lionheads and orandas. A lionhead is very

similar to the fantail but without a dorsal fin; the back should be quite smooth without any trace of bumps or spikes. The oranda is as the veiltail in all respects. Both lionhead and oranda should have a broad, bluntish head, upon which the hood will form; the hood takes some time to grow and therefore will not be found upon young fish.

Bristol shubunkins. This is a nacreous, or calico-type, fish and so all metallic scaled fish in the progeny must be got rid of. A heavy body is not required, therefore choose fish with a nice streamlined shape; the tail should be largish, with well-rounded lobes that indicate a strong possibility of it approaching the desired shape of the ideal fish. There must be no sign of the tail drooping as this fault will tend to get worse as the fish grows.

With the metallic scaled form of fancy goldfish it is advisable to keep, and breed from, only those fish which change colour within 12 months; preferably they should change from the wild colour earlier than this. The nacreous group, however, show their colour quite early in life, making it fairly simple to pick them out. Select those showing the deepest coloration, for some fish have a tendency for their colours to lighten with age.

The final choice should be made from those fish which conform closest to the Show Standard outline and exhibit a good multi-coloured pattern of varying deep colours, preferably set upon a blue background.

Culling the Young

During the process of culling you will have found that the varied shapes and faults found in the young of the fancy varieties of goldfish are legion, but do not be disheartened. Far better to raise six good quality fish of which you can be justly proud than to waste food and space upon a tankful of useless fish. It is only by being selective and ruthless in your culling that you can hope to improve your stock.

Of course, you may find some fish that show a particular feature very well; perhaps one has a good colour, an excellent caudal or body shape but fails in some other way. Keep this fish and

use it to cross with another fish that is good in all respects other than the feature in which this particular fish excels. From the resultant young it should be possible to find a few that carry the good points of both parents.

One way of learning the points to look for in young goldfish, apart from studying the Standards, is to visit the various fish shows and exhibitions, many of which have a breeder's section for fancy goldfish. Study the best of these young fish and then compare your fish with them. This month (15-19th August) the Midland Aquatic Show at Bingley Hall, Birmingham will provide such an opportunity.

Obtaining Your Stock

It is after visiting a show that many newcomers decide to take up the hobby. If a show catalogue does not contain the names and addresses of breeders and/or exhibitors, then enquire from one of the club officials, who are usually in attendance, for likely addresses of breeders. Most breeders of goldfish are true amateurs and will normally be pleased to show you their stock of fish, if you first arrange a convenient time, and will do their best to answer your questions.

Having decided upon the variety you would like to keep, memorise the points mentioned above and then select, say, six fish from amongst those young fish which a breeder is prepared to sell. Do not expect the breeder to part with his best fish, because usually he would refuse to do so. However, the quality of the adults can be judged and this can act as a guide to the quality of the stock from which the young have been bred.

Selecting half a dozen young fish, of about 1 in. or so in length, should ensure that you will obtain a true pair when they have grown to breeding size. This method of obtaining your fish is safer and more reliable than purchasing adults, which may, possibly, be past their best, and by buying from an amateur breeder you are sure that the fish are acclimatised to conditions similar to those that you will provide.

Fish of the size mentioned should not prove difficult to rear. With adequate space and food they will make good growth and should reach around 2 in. by the end of the year. Food can consist of all those foods normally fed to adult fish. White worms, chopped earthworms, daphnia, bloodworms, mosquito larvae, hard-boiled egg, scraped liver, boiled fish, Bemax, porridge oats and commercially prepared packed and freeze-dried foods etc.

Finally, here is something to illustrate my belief in hard culling. In the June issue of *PFM* I wrote of the two spawnings of lionheads which occurred during February. From around 1,000 fish regular sorting has reduced the number to just seven fish

that I am prepared to keep for my own use, the others being sold to hobbyists interested in this variety of goldfish. The first fish changed colour at 12 weeks of age and this, if a male, will be bred back to its mother, who also made the colour change at around the same age. The resultant young should show an increased tendency to turn gold at an early age. The remaining six fish had all completed this change 4 weeks later.

Holiday Time

At this time of the year the perennial question arises—'will my fish be safe to leave during my annual holiday, or shall I ask someone to look after them for me?'. The answer is that your fish will come to no harm during your absence. In fact every year I lock up my fish house for 2 weeks and have always returned to find the inhabitants in perfect health. My advice is not to ask a stranger to feed your fish; this is not necessary and a fast will do the fish good.

A few days before leaving give the tanks a good flush out, to remove any stale water, but leave any algae that are growing on the base or walls of the aquarium as this will provide a browsing area; feed plentifully with live food, which will avoid polluting the fresh water.

During your vacation, provided that the fish are in good health and have been well fed previously, the fish will live off their reserves of fat and be quite safe. In Nature there are times when food is abundant and others when there is a shortage. Most living creatures are built to survive these periods of hunger if they are not too prolonged. In fact, it is better to underfeed rather than give an excess of food.

Too often an aquarium left in the well-intentioned care of a friend or relative is turned into a polluted mess of smelly water and dying fish owing to decomposition of uneaten food. Be safe and leave the fish to care for themselves—you will return to a tank of clear sparkling water and alert healthy fish. These remarks apply equally to adult fish and this season's young.

Pond Precautions

It is surprising how the level of a pond can drop during a dry hot spell. During June the level of my pool fell 6 in. during a hot spell which coincided with my being away from home for 7 days. The very small shallow pool is not therefore the best place to leave your fish if you are to be away for any length of time and it would be safest to give them temporary quarters elsewhere where the danger of water evaporation is less likely to occur.

If you have such a pool and it contains plants it would be a wise precaution to fill it to overflowing before leaving and then cover with a

Large masses of rushes and irises such as these growing in a natural pond can readily develop in small shallow garden ponds. They disperse a great deal of water in dry weather and can be responsible for the water-level falling so quickly that the pond-owner might believe a leak has occurred.



Photo: J. ELIAS

sheet of clear polythene, well anchored at the edges, to prevent any rapid evaporation and possible drying out of water lily crowns or other plants. The point is to ensure that if the worst happens the plants will remain damp until your return. I feel that these very small shallow ponds are a constant danger and worry, so far as fish and plants are concerned. I would most definitely not recommend the purchase of one.

Larger pools do not present the same problems and it is only necessary to make sure that the water level is high and then cover with Netlon or some similar type of netting to prevent depredations by cats or fish-catching birds. Prevention is

better than cure, and to arrive back from holiday to find that several of your best fish have provided a tasty meal for the neighbour's feline 'Tiddles' is not the best way to end a vacation.

My own pool is kept covered with $\frac{1}{2}$ in. mesh Terylene netting throughout the year and I have never yet lost a fish through anything but natural causes. There is an added advantage to keeping the pool covered; during the autumn wind-blown leaves of all but the smallest kind are prevented from falling into the pool and are easily removed from the netting. One contributory factor towards possible winter pollution of the pond is thereby avoided.

LETTER

To Be or Not to Be—Northern or British

As the storm clouds gather and the said Associations prepare to do battle, I wish to make known certain facts, which, to say the least, have been deliberately misinterpreted to aquarist clubs in this area.

1. The Tyne-Tees Area Association (FBAS) has not issued any ultimatum to clubs saying they cannot belong to other federations or associations if they are already in one—but the Northern Federation have.

2. We have not told clubs that they cannot show under northern rules if they are members of

another federation—but the Northern Federation have.

3. The TTAA do not impose a boycott on northern-held shows, but have and always will fully support them—but the Northern Federation did this to the TTAA show.

We could go on and have a slanging match, a show boycott and a general war of federations in this area, but this would do no good to anyone and most certainly a great deal of irreparable harm.

Therefore I do openly challenge the hidden faces (Northern) to come out and do battle. But let our weapons be the provision of amenities and other such services that will forward the knowledge and well-being of all aquarists in this area. Then whatsoever the outcome at least the aquarist cannot lose and freedom of choice would prevail.

GEO. T. LIDDLE

Press Officer, TTAA (FBAS)



by
ARPEE

Personal COMMENT

Before deciding on what type of tank to have in the home I think it wise to do a really searching survey, not only of the entire range available, but of the environment in which the apparatus will be set up. A further vital consideration is what type of fish are the intended occupants, as the wrong combinations could prove to be an aesthetic offence rather than the attractive domestic feature one imagines will result. At one time, of course, all tanks were angle iron and painted green. They looked fine in an outside conservatory but made one wince when drawn into the family circle. It took a long time for manufacturers to do daring things like producing black or white tanks, and then some genius settled for stainless steel. More recently we have all-glass aquaria, some with plastic simulated-wood edgings, and still others with finely designed synthetic frames. And now a range which covers the styling of furniture from centuries ago up to the present day. Quite obviously, to pick the wrong one for your particular room when there are so very many possibilities is shortsightedness of the worst possible kind. After a number of changes of type to suit my own requirements I have found that I need to study the proposed situation for the new tank very carefully in my mind's eye, and then to simulate the colour and size of the aquarium in the very spot, testing the result under varying lighting conditions. In some cases a dealer will allow you to try out a tank for visual appeal, but if so, don't expect him to stand the loss if you drop a hammer in it. A lot depends on the size of your choice, and it may be impracticable to do trials with the bigger sizes which usually have to be ordered specially. A point which must be studied is whether the aquarium is in any way obtrusive in relation to its proposed occupants. The aim of the average exercise is to make the tank disappear when there are fish in it—it is they, after all, who are the *raison d'être* of the whole affair.

To exemplify what I mean, I would imagine that a Queen Anne type of aquarium cabinet in a penthouse flat containing G Plan furniture would make it an item of ridicule, and its occupants would never live it down even if its owners did.

Even in the correct furnishing environment such a tank would need to be related very specifically to species one intends to keep. A heavy, ornate, frame needs a compelling and vital foil by way of fish, and there are very many popular fishes which would, for one reason or another, fail completely under such conditions. The tinfoil barb is the sort of fish which would very distinctly succeed in a situation like this, whereas angels and discus might come off less well on account of their comparative lack of mobility. Marines, by and large, would hold their own by virtue of colour, activeness and size, but not everyone wants the worries of the saltwater world.

One significant thing is that the all-glass aquarium and the stainless-steel aquarium win hands down as all-situation compatible from the aspect of unassertiveness, and if you have any doubt about your ability to judge for yourself on the lines suggested above, I feel that either of these types is completely 'safe' aesthetically. You can keep anything in them, from tadpoles to tangs, and you will never be under any illusions about the relative importance of the tank or its contents. I am still far from convinced about the safeness of the all-glass tank as a long-term bet, but that is quite another matter.

Whilst so many fishkeepers go for community freshwater collections, it is right to draw attention to the possibility that the prestige tank might in some surroundings be far less suitable than might at first appear. If, having considered all things and mustered the wherewithal, you decide to add to the beauty of your home by buying a specially designed aquarium cabinet, I doubt whether there will be any real regrets. Our fish are beautiful things and deserve fitting surroundings to enhance, not drown, them.

I note with pleasure that Vitakraft are marketing a prestige range of aquarium cabinets—their recent advertisement states that there are over 40 types to choose from. I note with much less pleasure that no prices are quoted, an irritating habit to which I have drawn attention before: it suggests either that there is something to be ashamed about as regards the cost, or that those select few to whom the advertisement is directed just don't worry about the money so long as they are in the fashion. Good taste is not a prerogative of the wealthy, however, and there will be many of modest means who will try, some time, to afford something more imaginative than the stark outlines of the average aquarium.

'Giant' Among the Danios



Danio malabaricus

By RUDOLPH ZUKAL

Photographs by the author

Translated by F. MARSH

ALMOST every aquarist is acquainted with the little danios, *rerio* and *albolineatus* (zebras and pearl danios), rather more perhaps than with *Danio malabaricus*, and this is almost certainly because the giant danio is neither so easy nor so willing to propagate as its related species. If this were not so, this peaceful, shoaling fish that grows to a length of about 4 in. (10 cm) would receive rather more of our attention. I hope I may contribute something to its popularity with the information given here.

Danio malabaricus belongs to the large Cyprinidae family and was first imported into Europe from its home in the western coastal areas of northern India and the island of Ceylon in the year 1909. Although its method of spawning was soon known, only a few specimens were appearing on the market. Certainly I had to wait for several years until I was able to acquire eight specimens of this beautiful fish.

Its elongated body is elegantly slim and rather pinched-in at the sides. The steel-blue back blends into a gleaming green on the sides of its body. The head is silvery and the belly coloured a delicate pink. From the gills two or three gold-coloured horizontal bands stretch back along the body, the last band tending to be rather broken up. The gold bands divide up the three or four steel-blue stripes that adorn the sides. The gills are decorated with a gold-green



fleck. The eye is proportionately large, with a gold-coloured iris. Apart from the caudal, the fins are colourless.

Even in adult fish sex differences are not always easily recognised, although the male is the slimmer fish with a more intensive coloration. At spawning time his pectoral fin becomes orange and sometimes a white spawning 'rash' appears on his head. The female, on the other hand, is fuller in the body and slightly less intensively coloured.

I keep my *malabaricus* in a large, long, not over-planted tank at a temperature of 68°F (20°C). No special water need be used but when a partial water change is made the water for re-filling the tank should have stood for some time. As I have already indicated, the giant danio is a peace-loving community fish, becoming a danger possibly to small fish only in old age. It should be kept in a shoal—a tank in which these fish are shoaling is always full of interest; they are both skilful

In the photograph on the preceding page the male giant danio is the upper fish. On this page the pictures show pre-spawning and mating phases in the breeding of a pair of giant danios. During the rapid spawning the male is seen to 'hold' the female briefly with his curved caudal

and fast swimmers. They resemble the pearl danio a little in their colouring and, with correctly placed lighting, where it falls slantingly into the tank from front to back, their delicate colouring stands out beautifully. Since they are good jumpers it is very important to keep the aquarium well covered. They are not choosy feeders and take practically any type of food. But it goes without saying that they should be given a varied diet or they will not thrive or reach the desired size.

As I wanted to photograph the spawning I prepared a longish tank planted in a usual manner but with some fine-leaved plants laid in, as shown in the photograph. It is not necessary to use a sand base for the spawning, just small stones layered on the bottom, between which the eggs can fall. This preparation must be made because giant danios are very keen egg-eaters. I prepared the tank with tap water and raised the temperature to 70° F (26° C). From then on the procedure was much the same as that shown by *Brachydanio rerio* and other danios. After the chasing of the female came the importuning, displaying, stimulating and so on. The actual egg-laying takes place at great speed—the male wrags his caudal fin over the hind part of the female, the fish part, and the eggs fall on to the bottom. The eggs themselves are fairly large, slightly golden in colour and several hundred are laid at a spawning. The whole process lasts about 3 hours. As soon as the egg-laying is completed the adult fish must be removed from the tank so that the eggs are spared.

The fry hatch after 36 hours and are free-swimming after a further 4 days. Any fine dried food may be given. The spawning may be repeated with the adult fish after a few weeks—in fact they may be spawned about four times a year.



At the pair of giant danios separate from their brief embrace the conspicuous eggs swirl in the water and drift to the bottom. If the aquarium bottom is layered with shingle or small pebbles the eggs reaching the shelter of the crevices between the stones will not be seen by the parents, who will otherwise eat quantities of them.

Meetings and Changes of Officers

BRITISH KILLIFISH ASSOCIATION. New membership secretary (beginning): Mr S. K. Brown, Bonben, Elm Grove, Buntingford Park, Peterborough, Cambs. L34 2RX. Secretary, Mr W. Davison.

BRITISH MARINE AQUARISTS ASSOCIATION, LONDON & SOUTH-EAST GROUP. Secretary, Mr B. Wilkinson; assistant, Mr P. Ireland (1, Sinclair Road, Wallington Forest, London, E.4); P.R.O. Mr Graham Cox.

DEBBY REGENT AS. President, Mr R. Peach of Oldham; vice-president (proposed), Commander G. Grant; chairman, Mr R. Bell; vice-chairman, Mr J. Bland; treasurer, Mr T. Jerrard; general secretary, Mr D. Robertson; assistant, Mrs N. Robertson; show secretary, Mr R. Harlow; assistant, Mr T. Bullock; correspondence officer, Mrs Newman; editor, Mr R. Holman; assistant, Mrs N. Robertson; librarian, Mrs Ford.

GAINSBOROUGH AS. Meetings: 2nd Thursday of month, The Home & Growth, Gainsborough, 5.30 p.m. New members very welcome.

GOLDFISH SOCIETY OF GREAT BRITAIN. Change of secretary to Mrs M. Dudley, 163 South Park Road, Wembley 600, London, SW19 5RX (phone: 81 189 5162).

HASTINGS & ST. LEONARDS AS. Meetings: 2nd and 4th Fridays in month, The Conservative Office, Cornhill Gardens.

HUDDERSFIELD TFS. Chairman, Mr N. B. Gibson; vice-chairman, Mr J. Burton; secretary, Mr C. Woodhouse (1087 Manchester Road, Littlewood, Huddersfield); show secretary, Mr D. Hoagh (17th & Stronach Court, Stronach Avenue, Golcar, nr. Huddersfield); treasurer, Mr D. Harrop.

LEAMINGTON & DAS. Secretary, Mrs P. M. Stoodley, 4 St John's Terrace, Tachbrook Street, Leamington Spa. Meetings: 1st & 3rd Tuesday of month, Trinity Hall, Trinity Street, Leamington Spa, 7.45 p.m.

NEW FOREST AS. Secretary, Mr R. Travis (6 Auddred Avenue, Brockenhurst, Hants, SO4 7BS). Meetings: 1st Monday in month, The Community Centre, Springton, Hants.

NEWBURY & DAS. Meetings: every 2nd Monday, 7.30 p.m., The Town Hall, Newbury, Berks.

NORTH STAFFS AS. New secretary, Mr D. T. CME (11 Toft Lane, Bichston Park, Burton, Stoke-on-Trent, Staffs).

THORNE AS. Change of address of secretary Mr B. Banks: 74 Marshfield Road, Moorlands, nr. Doncaster, Yorks.

UNITED AS. New venue, Winchester Road Methodist Church, Highams Park, London. 8.00 p.m. alternate Thursdays. New members welcome. Details: phone 01-825 6404.

Concerning the Colours of Fishes

By IAN C. SELICK

TO the majority of hobbyists, coloration is the most important facet of fishes—it was in all probability the iridescence of a shoal of neons, or the bright colours of a swordtail, that attracted the fishkeeper to the hobby in the first place. Now it is coloration he strives for, together with fin perfection, year after year, as he breeds thousands of guppies or platys. As for the marine aquarist, how many were originally lured by the bright blues, reds and yellows exhibited by these fishes? And yet how many aquarists know how Nature produces her fantastic spectrum? How many know why these colours occur? In this article I shall attempt to give a basic understanding of what is involved in fish coloration.

Do Fishes See Colours?

We all know that white light can be split by a glass prism into a rainbow of colours, each colour being defined by a particular set of wavelengths: violet, indigo, blue, green, yellow, orange and red. These are the colours that make up our visual world, and basically the world of our fishes. However, not all fishes are able to see all these colours, and others are able to see another range of colours that are invisible to us, namely ultra-violet. Although we know that fishes can see colour, we are by no means certain, in the majority of cases, how they see them: are their eyes simply sensitive to a whole spectrum of colour, without distinguishing between the different wavelengths or do they see colour as we do?

The colours of a fish, like that of any object, are due to some, but not all, of the components of incident white light being reflected. The colour of the light reflected is said to be *complementary* to that which is not reflected. The colour of a surface can be produced in two ways: the complementary colours may be removed because of the physical nature of the surface, or because of its chemical composition. The former are termed structural or physical colours, the latter pigmentary or 'chemical' colours.

Production of 'Physical' Colour

Fish colours can be said to be physical rather than chemical when the physical nature of the

surface is responsible for their production. They are due to one of four phenomena: *interference*, *diffraction*, *scattering*, or straightforward *reflection*. However, colours produced in this way may be modified by 'chemical' colours.

(1) *Reflectivity*. The white coloration and silver scales of fish are due to the reflection of all the wavelengths of visible light, although it is possible that there may be some differences in the ultra-violet part of the spectrum. This reflection, which gives such fish as *Metynnus* their silvery appearance, and the bellies of most catfish their whiteness, is due to a layer called the *stratum argentum* in the skin. However, the *stratum argentum* is not the only cause of silveriness, it may be due in addition to various oriented silvery layers.

(a) *Stratum argentum* (s.a.): This is made up of a more or less thick layer of closely and densely packed crystals or platelets of guanine. The s.a. lies in the subdermis of the sides and bellies of most silvery fishes, e.g. herring, salmon, bleak, sea-bream and mackerel. Its reflecting platelets, as seen in transverse section, usually lie parallel to the surface of the body. The bellies of many fishes, e.g. cod and salmon, are matt white, this presumably being brought about by the crystals of the s.a. being irregularly stacked. A s.a. is found to cover the internal organs of many fishes, e.g. herring, and many otherwise transparent fishes such as the glass fish, *Chanda*, and the glass catfish *Kryptopterus*. In some fish, the s.a. is the sole cause of silveriness.

(b) *Orientated silvery layers*: The majority of silvery fishes possess, in addition to the s.a., layers of oriented reflecting platelets. These layers are always found outside the s.a. when both occur. The oriented layers are sometimes found immediately inside the skeleton of the scale, e.g. salmon; sometimes outside the skeleton of the scale, e.g. gadoids; and sometimes deep in the integument and immediately external to the s.a. itself. The oriented reflecting platelets are sometimes confined to a single layer of cells, and sometimes, particularly on the flanks, they are contained in several superimposed layers of reflecting cells. There are considerable differences in the pattern of oriented layers in different fishes. In some fishes the entire surface is covered with oriented reflect-

The glass catfish, *Kryptopterus bicirrhus*. Although without marked colour and almost transparent, this species shows a silvery covering (stratum argentum) to the internal organs.

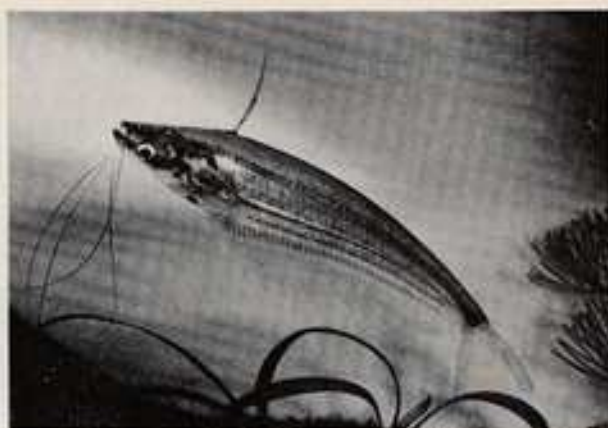


Photo: S. KAHL

ing cells, whereas in others the oriented reflecting cells are only found covering some small region.

On the whole, the above two reflectivity structures cannot be used to control the degree of reflectivity—they are primarily used as bases for supplementary colour modifications, and to prevent light from reaching the internal organs. However, in the oriented silvery layers, the guanine crystals may have the ability to be dispersed or concentrated within *guanophores*, special cells which respond to visual nervous control and expand in light surroundings (thus reflecting more light) and contract in dark conditions. This may account for the varying degree of 'lightness' seen in silvery shrimps and other fishes after the aquarium lights have been switched on—although the effect is also modified in many cases by changes in black pigment cells.

Of the remaining three types of physical colours, two, namely interference and diffraction, produce iridescence. Iridescence is the phenomenon of shimmering with different colours, the colour changing according to the viewpoint. Scattering causes a non-iridescent, i.e. non-changing colour.

(2) *Interference colours.* These are produced when white light is reflected from both the outer and inner layer of a film of some reflecting material. In fishes they are produced by stacked plates of guanine, as in the oriented silvery layers, but the spacings between plates are very regular; light reflected from the inside surface travels further. If the distance between the surfaces is such that 'optical retardation' is an odd number of half wavelengths, part of the spectrum is reduced or cancelled out and we see the remainder. As the angle of incidence effectively alters the distance the light has to travel between the two layers, altering this affects the wavelength of light that is seen. Such changes of colour with different

angles of vision constitutes iridescence and the series of colours seen is called Newton's series.

Perhaps the best known of iridescent aquarium fishes is the Congo tetra (*Micralastes interruptus*), in which a series of mostly greens, blues and yellows can be seen on certain parts of the flanks, the colours changing and flashing as the fish turns in the light. The metallic colours seen in many fishes, such as the beautiful blue stripe in neon tetras and cardinals, and the yellow colours seen in some goldfish, are caused by interference plates overlaid with pigment—in the former probably yellow, and in the latter, red pigment.

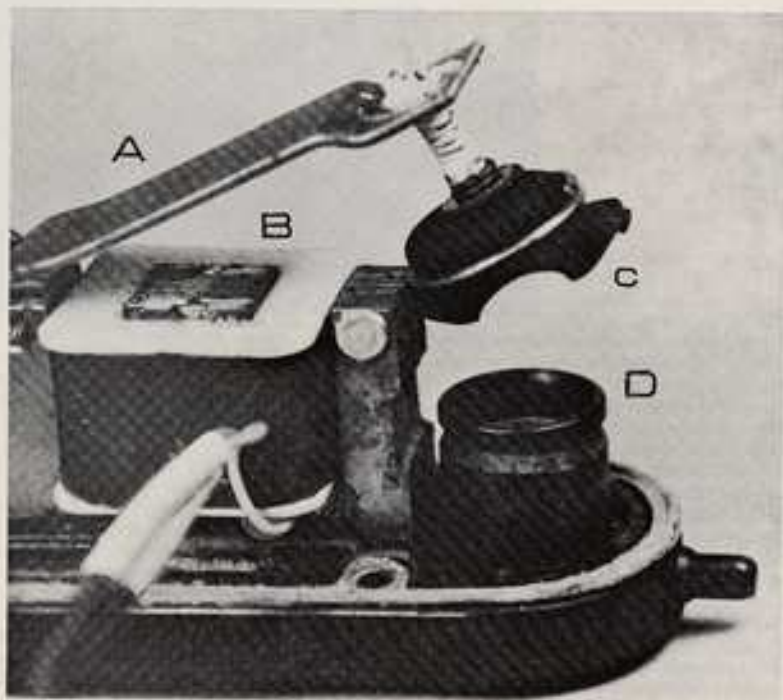
(3) *Diffraction colours.* Coloration produced by this method does not occur to any great extent in fishes, as far as I am aware, except perhaps in the eyes, where it is modified by the red colour of the blood in the capillaries; I will thus not discuss it further. Colours produced by this method would also be iridescent.

(4) *Scattering.* Colour produced by this method is not iridescent and is caused by the scattering of the shorter wavelengths (i.e. blues) of light by small particles situated in the skin of the fish. This same scattering causes the bluish colour of cigarette smoke, and the blue colour of the sky.

The presence of such scattering in fishes, is in dispute; but it is thought that blue colours found in some gobies, and possibly the blues seen in many other marine fishes, are due to this phenomenon. The incident light is here scattered by minute crystals of guanine in *guanophores* overlying *melanophores* (black pigment cells), which tend to increase the intensity of the colour. However, this very intensity of colour is the main downfall of the scattering theory—the blues produced seemed too pure and too intense to be solely due to this effect.

Next month: Colour pigments and 'colour feeding'.

Quietening a Noisy Aerator



THE interior of the air pump shown in the photograph is typical of the many cheaper, low-output models on the market today. Countless thousands of them have been produced over the years, giving excellent service all around the world; yet the design is such that, in time, they may become rather more noisy than when new. If this occurs, it is almost invariably due to a combination of wear and lack of attention, and the problem can be cured (or prevented) by a regular servicing every 6 months or so.

The noise is generally the result of the vibrating armature bar (A) striking the top of the coil/electromagnet assembly (B). This occurs when the armature bar has excessive travel, arising from distortion or weakening of the diaphragm (C), or alternatively to failure of pressure to build-up in the valve block (D). The trouble with D can occur when the valve seatings are heavily coated with dust and grime, or if the pump is not connected to a filter or air stone.

The photograph shows how the diaphragm becomes permanently distorted and weakened from the heat generated by the coil and the constant 'flexing' movement: this diaphragm was originally a flat, circular disc of rubber around the size of a top piece, held in place over the top of the valve block by a metal or plastic ring. Unless the pump is serviced periodically, output will fall and an irritating 'buzz' may gradually develop.

The remedy is simple! Purchase a new diaphragm—costing just a few pence—and fit it in place of the old one. However, be careful to note the order of rubber and metal washers sandwiching the old diaphragm when you disassemble it. Then gently remove the grime from the valve seats with a pointed matchstick—never use anything metal, which will damage the plastic. The top valve is usually easy to get to, the lower one is (in the pump shown) accessible from underneath after removing a rubber plug. Sometimes the whole valve block can be removed by loosening one central screw,

making routine servicing so much easier. Although valves are not subjected to the same abuse as the diaphragm, you might like to replace them, too, to make it a first-class job; but make sure you can get replacements before you remove the old ones, which are often glued in place. And remember to replace or clean the air filter if one is fitted, though all too often it is quite useless as unfiltered air can get in freely around the electric flex hose or between the pump body and base. With a little thought these problems could perhaps be cured by the hobbyist, or a filter fitted where none was before, to ensure maximum efficiency from the pump for lengthy periods.

If after this service the pump continues to make an unacceptable amount of noise, there are still three possible remedies.

(a) Put a clamp on the air line leading from the pump. Careful adjustment will often increase the

back-pressure sufficiently to quieten the pump, without greatly reducing the total air output.

(b) By adjusting the nuts on the bolt between the armature and the diaphragm, the clearance between the armature and the top of the electromagnet can be increased very slightly.

(c) A small piece of thin card, about $\frac{1}{4}$ in. square, can be fitted between the armature bar and the electromagnet at the point where they pivot. This often helps to deaden sound transmitted through the casing of the pump.

One word of warning: never shut the pump in a small box or similar restricted space to try and reduce the noise. The coil gets very warm indeed, and if there is any restriction on the atmosphere cooling the outside of the pump body a serious fire can easily occur.

CLIFF HARRISON

Photographs by the author



Lettering on the photograph opposite is identified in the text. Replacement of aerator diaphragms is usually a simple job, particularly with the type shown in the photograph on this page

Transatlantic Topics

By JIM KELLY

Picking up his glass of beer, my American host shook it and indicated that there was nothing finer for cultivating micro worms... Was I hearing things? Beer as a hair rinse, I had heard of, but the only link between the drink and the hobby was surely for the consumption of the breeder, not the food. Visions of dipomanic worms eagerly pursued by alcoholic fry invaded my senses.

'Seriously,' he went on, 'Next time you mix up a culture of micro worms mixing some beer with the

cereal—it lasts much longer than milk and is more beneficial than water... and the fish love 'em this way.'

'I bet they do,' was all I managed. 'Will you have the same again?'

* * *

Most marine fishes have never been cheap in price in Britain, so it is only natural that those aquarists with a taste of salt in their tanks must covet their Florida cousins. When they

want to stock an aquarium, citizens of the Sunshine State simply swim out to sea and catch them.

And what a lot they can bring back. In the cooler waters abound the damselfishes such as the iridescent blue chromis. Keeping them company are the blue and yellow bear gregory and the yellowtail, whose young lack the yellow caudal and sport instead a sprinkling of pale blue spots.

Around the many wharves and reefs is to be found the 'chameleon' sergeant major. He can change colour in an instant from a black-banded, yellow creature, to silver or all black. In the domestic set-up the S.M. needs plenty of elbow space, often marking out a particular territory as his own and chasing away any intruders, especially others of his kind.

The only thing that destroys my image of this idyllic haven for marine enthusiasts is the hole the Miami hotel accommodation left in my cheque book. Taking those expenses into account, fish aren't so dear over here after all!

* * *

It seemed impossible even in this age of marvels but the National Cash Register Company of Dayton, Ohio, have produced a microfilm only 3 centimetres square which contains 773,746 words, enough to cover 1245 pages of the average book. We've had the Lord's Prayer on a farthing—but the whole Bible on a space no bigger than a postage stamp! And it isn't just a laboratory novelty but a serious attempt to demonstrate a new process for storing information.

Called 'Ultramicrofiche' it would enable a 60,000 volume reference library normally occupying several rooms to be reduced in size to a single filing cabinet containing these plastic cards.

In the business of fish classification it would be a boon. Instead of ploughing through pages of references the researcher would simply obtain the requisite card, place it in the reader and the machine would automatically flash an enlargement of the required page on a screen. To keep it

up-to-date all you have to do is to feed the machine with current information.

But then some aquarists cannot find the time to feed their fishes, let alone a machine!

* * *

Chicago's Tommy Kelly and I have much more in common than a surname, a passionate love of fish and wives willing to pander to our interests. We both agree that tubifex worms are a good food for our fishes.

We don't deny that they can carry disease or that if you are content to purchase these worms and merely off-load them into the tank then you are asking for trouble. For this reason and this reason alone we feel that this fine fish food has become over the years the 'whipping boy' of the hobby.

To keep tubifex for long periods has seen the aquarist using many and varied methods but nothing can beat leaving the worms under a running tap, the method used by the aquatic trade. Use a shallow container such as one of the plastic cat litter trays sold by most pet stores. This will allow the ball of worms to spread themselves out like fitted carpet.

To emphasise the fact that many

other aquarists consider these worms to be excellent food I quote Henry Kauffman, famous in America for his super guppies: 'The difference between a guppy and a show fish champion is the use of tubifex worm in their diet.'

Now do you believe us?

* * *

Some confusion seemed to reign 'over there' recently when an author described willow moss, *Fontinalis antipyretica* Linne, as Java moss. Correcting the mistake, Kappy Sprenger pointed out that the true Java moss is *Vesicularia dubyana*, and though often confused in appearance with willow moss, it is suitable for the tropical tank whereas *F. antipyretica* is not.

For readers who dislike scientific names I suggest that they consult Colin Roe's A MANUAL OF AQUARIUM PLANTS, which both illustrates and describes each variety of these plants.

I think that the similarity of the two is responsible for many aquatic stores innocently selling willow moss as suitable for the tropical aquarium. In most cases where this has happened the plant degenerates into a slimy mess. When willow moss does survive in tropical tanks it is usually in the form known as *gracilis*.



Young Prizewinner

TWENTY-EIGHT trophies and lots of prize cards have made it a very good year for 14-year-old Janis Gullane of High Buxton, Derbyshire, and now she can add to her successes the £100 InterPet Club Prize.

The whole Gullane family are keen members of the Buxton and District Aquarist Club but Janis is the main pot collector. She keeps her fish in 14 tanks in the cellar of their house.

Janis has a formula for winning fish prizes—use large tanks and moving water—feed well and use lots of care. She used the same logical approach for winning her '£100 worth of Aquarium Goodies'. Entrants to the competition had to select the order of importance of ten items for starting an aquarium. She simply worked out in order what she would need to set up an aquarium.

The winning combination was worked out for InterPet by four well-known aquarists. Out of the hundreds of entrants—many of whom are well-known names in the club world—Janis was the only one with the winning combination of choices.

In the photograph Janis is seen with her mother and the managing director of InterPet, Dr Neville Carrington, on their visit to the InterPet offices.

'Gardening' With Water Plants

By W. A. TOMEY

Photographs by the author

In one branch of the aquarium hobby, one special aspect at least, Dutch aquarists boast of leading their fellow-aquarists all over the world. That special aspect is 'tank furnishing' or 'aquascaping' or whatever you choose to call it. It is the 'art' of laying out and planting the tank interior, using rocks and terraces and wood and, especially—plants! Plants in large variety and in great numbers.

I don't know why we are so keen on planting even the last bare patch of gravel in the tank, but

just have the 'feeling', but yet one in which even the less-gifted aquarists can get pretty far, if they are only prepared to listen to their successful friends and to learn their lessons.

Most Dutch aquarist societies have, at regular intervals, their local contests in furnished aquaria and at national level the Federation organises a contest every year. As in any contest there are quite a few rules and regulations (not only the interior, but also the exterior of the tank, the



Careful planning and regularly given maintenance is required to achieve and keep a display such as this.

it may well be because the Dutch have always been agriculturists by tradition. Now that our numbers force us to cluster in more and more ever-growing cities, the narrow strips of land in between being the playground of industrialism, aquarists perhaps react with a bit of the old gardening instinct in their hobby.

Now, when I say 'gardening' one could, of course, visualise this in two ways. One could plant the future crops in neat regular patterns, scientifically studied for maximum economic returns, or one could use the term 'gardening' in a non-economical but far more beautiful sense, decorating and planting your home garden with all the wonders that Nature allows to grow in it. Of course it is the latter that the aquascaper aims at when planting his own underwater garden.

Not an easy job, and one for which some people

fish population and the technique are in fact being judged), but these are not within the scope of this article. Nor at this time do I intend to unleash a landslide of good advice of how, where and what to plant etc. Instead, let us just try to answer the question, one which is also often asked in Holland: how do these people manage to get such beautiful aquaria?

The answer is really simple; by devoting the necessary time, effort and patience, amalgamated of course, with a certain degree of feeling for relations within the available space of a tank. A bit of feeling for shape and colour of the plants is also required, and especially knowledge of the various habits and peculiarities of plants available.

It is a remarkable thing these days that people have no time to spare, and in the hobby this results in many hobbyists choosing to have slow-



Picture 1



Picture 2

growing plants that require little maintenance. If you ask owners of 'top aquaria' how much time they devote to their tank a typical answer will be 3-4 hours per week, depending on tank size, but the time is given *regularly*, spread over the week. Just this regularity is the key of cultivation! To restore a run-away aquagarden, to bring it back to its original beauty, is difficult and costs much more time and effort.

Picture 1. *Main subject:* beautiful light *Synnema*, a fast-growing aquarium plant requiring lots of maintenance. In particular, it has to be 'topped' regularly, because otherwise the very decorative heads will reach the water surface, leaving only the stems for the spectator. *Synnema* is very suitable in large groups against the rear of the tank and as 'cornerings' in large tanks. Keep the far plants somewhat high and keep them lower towards the front, so that a kind of steep slope is created from front to rear.

Middle groups: *Cryptocoryne petchii*, a well-growing cryptocoryne, very variable in colour, reddish brown, bronze spotted etc. depending on place, soil, light, season etc. A plant with few demands, only the removal of too-lengthy leaves in time and, especially with very dense growth,

the removal of enough leaves for the plants to get 'air', otherwise they can be suffocated.

Foreground: the aquagrass, *Echinodorus tenellus*, which on a light soil can quickly form dense 'fields' by the rapid production of runners. Because of this very rapid propagation suffocation is not impossible, especially since detritus and algae also can easily settle in the 'lawn'. *E. tenellus* asks for an attentive owner, one who will maintain his 'grass' well.

Picture 2. *Main subject:* *Limnophila (Ambulia)*. These plants are eminently suitable as bushes at the rear or to the sides, but also give satisfaction as separate little groups. As they can grow quickly they require a lot of maintenance, and if you shorten the stems, take care that you give them unequal lengths as seen in the photograph.

We have had great difficulty with this plant, whole bunches of it just 'disappearing' suddenly in a few days by some mysterious disease, but it seems that this very beautiful species is now slowly recovering from that situation.

Behind the 'ambulia' there is another old-timer, *Ludwigia natans*, which is a fast grower, especially under strong light or with some daylight provided. It is not impossible that this ludwigia,



Picture 3

with its red-green leaves, once having reached the surface of the water will take so much light away that the 'ambulia' will suffer. The experienced hobbyist foresees this event in time and takes steps to prevent this by 'topping' the ludwigia. In this way the water surface keeps open and light can reach 'ambulia' unobstructed. This requires a bit of insight, attention and trouble, but it is the price of a hobby!

In the foreground you see a group of *Saururus cernuus*, called 'Leydse plants' in Holland, since they began their aquatic career in the town of Leyden. They can be found in many aquaria now, where they form a fine contrast with other plants. Since the growth of these plants is rather slow as compared with others, and since therefore the leaves have to 'serve' a relatively long time, it is advisable to cleanse the leaves between finger and thumb every now and then. In this way they remain a fresh light green—a beautiful combination with other darker plants!

Picture 3. In the centre of this photograph you see the large, very tender leaves of *Nymphaea lotus* var. *japonica*, a species of water lily imported from Japan. It has a beautiful reddish brown colour, giving a very contrasting effect in the surroundings



Picture 4

of mainly green plants. A large specimen can be used as a solitary plant between groups of others. To obtain a plant of such size, with leaves of perhaps 3-4 in., the rhizome has to be placed where the plant can develop without hindrance from other plants.

Sometimes more plants develop on one rhizome, although usually only one really develops to size. It is nevertheless important to leave the other, smaller plants since apparently the production of floating leaves is hampered or reduced by their presence. Such floating leaves are formed especially when there is lack of sufficiently bright light, and the age of the plant also counts. The only way to keep them under control is by repeatedly removing the floating leaves, although we have to realise, of course, that their formation is the natural habit of the plant, not a result of keeping it in a tank.

Because of its sometimes glowing red colour and the decorative shape of the leaves, it is not difficult to make beautiful combinations of this plant with others.

Picture 4. This view shows a combination of long *Myriophyllum hippuroides* (rear), *Alternanthera reinecki* (middle) and *Micranthemum micran-*

themoides (front). Of these three species the *reineckii* requires least maintenance. In a healthy tank it grows steadily, but in no comparison to the really fast growers, and the plant can therefore be kept in one place for a pretty long time. However, in the long run this plant also will need to be cut and replanted.

Myriophyllum hippuroides is a very beautiful plant with finely divided foliage of a soft green colour and a reddish stem. By its long, trailing growth it is very suitable for planting near the rear or at the sides of the tank. Under ample light frequent cutting is required, e.g. in summer it may have to be done once a week or at least every other week.

Microanthemum micranthemoides demands similar care. It is a very tender little plant that can become abundant by its creeping stems, which produce a lot of youngsters. Thinning the bushes is a regular requirement, albeit with care taken not to damage them.

Having described these four underwater pictures

it may be useful to give a warning. I have used terms like 'cutting', 'topping' etc. to indicate methods of controlling the plants. However, if you do this, always choose the youngest and strongest plants and don't rely too much on the lower portions of the plant's stem. Although these will give new growth that may well take some time. If we ask too much of these lower and older sections even the fastest growers will in the long run show this by giving 'thin' and weak growth. Therefore always use the top ends of plants for replanting and remove the lower sections.

Good plant arrangements usually are closely connected with the know-how of the aquarist, and are the result of experience, exchange of views with colleagues and continual and constant checking of what is being created by looking through the front pane of the tank. To keep a good arrangement in colour and shape depends strongly on regular maintenance, without which even the most beautiful aquagarden will disappear in a short time!

What's New?

Testing for Nitrites

NEW from Reliant Products (Basildon, Essex: distributed by C. J. Skilton Aquarist, Great Giblecks Chase, Butt's Green, Sandon, Chelmsford, CM2 7TR) is the **Reliant Nitrite Level Test Kit**. The kit contains a polythene bottle of indicator, a plastic phial and lid for holding the test sample of aquarium water and a 'nitrite level' coloration chart. Three drops of indicator in half the phial of aquarium water (either fresh or salt) will, the instructions explain, after one shake of the phial produce a coloration if nitrite is present (a

shade of yellow) for comparison with the chart. The chart analysis of the test readings also gives suggestions on how to correct the reading if necessary. The makers claim for the indicator that it is non-carcinogenic, stable, and has more sensitivity giving a wider range of 'nitrite level' readings. Recommended price, 55p + V.A.T.

L-Shaped Tank

AN out-of-the-ordinary aquarium design likely to be of particular interest to our North American readers is the L-shaped all-glass, polymeric-framed aquarium (O'Dell



Manufacturing Inc., 1930 South 42nd Street, Saginaw, Michigan 48607, U.S.A.). A specially designed 24 in. high wrought-iron stand, also L-shaped, has been designed to hold this tank, which would obviously be useful in a corner position. The tank has one-piece top and

bottom polymeric framing that, the manufacturers state, offers high dimensional strength and stability and is completely corrosion-resistant, for use with salt or fresh water. Other features incorporated into this L-shaped tank are a floating bottom, hidden water line, and

double-sealed, ground rounded edges with an optional recessed sliding glass top with a plastic strip that can be easily cut for use with any accessory. The manufacturers also market a complete sealed and shockproof plastic lighted hood sold under the brand name 'Polo-lite'.

MARINIST'S Notebook

By ROY PINKS

DESPITE the fact that there may be means of 'seasoning' newly set-up marine tanks other than by using one or more 'starter' fish, there is little doubt that the majority of new marinists will follow the convention of opening their innings with fish rather than chemicals. This is quite understandable as the whole object of the exercise is to keep fish, it is human to be impatient, and fish look better than dissolved chemicals. It should be noted that in many cases the seasoning process can be telescoped from several weeks to several days by introducing sand or gravel from a seasoned source, but the actual period required for nitrates to reach the safety concentration for the more delicate species must depend on purely local factors.

Selection of the right type of starter fish need not be the haphazard sort of affair it often is. All too often beginners buy as many different and highly coloured damselfish and clowns as they can afford and they so strain the finely balanced new system by overcrowding that the fish succumb individually or, worse still, collectively, to one ailment or another, and there is little left to show for one's efforts. It may be the case that, despite the reputation of a particular species for hardiness under seasoning conditions, this cannot be relied upon universally, and it sometimes happens that you will discover that you have a 'black spot' for a species which it will be difficult in practice to overcome.

Exactly what factor of your local environment might be lacking is anybody's guess at this stage of the art, and you will find it helpful to exchange views with others nearby, as water factors could well account for a lot. For example, I have always failed with dominos, which are supposed to do splendidly under all conditions. My own preference is for the yellow-tailed blue damselfish, the blue damselfish and the cloudy damselfish, though the *Daucylus* run them very close, especially *D. aruanus*.

The important thing in introducing starter fish is to keep them alive, to get them feeding, and

to keep them feeding, as it is their excreta which contribute towards the establishment and maintenance of the colonies of micro-organisms in the gravel on the floor of the tank, on which the success of the entire filtration system depends. This being so it is obviously wasteful to use more than, say, three 2 in. fish in a 30 gallons tank during its early days. One has to be patient once the initial group of pioneers has taken up residence. They should be left to settle down and to do their work without undue strains, and if they appear to set about their business normally, and to take food, leave them alone. Feeding should be restricted to clean live food, which is unlikely readily to cause pollution even if rejected by the fish. For this reason brine shrimps are ideal, particularly as they often induce a difficult starter to begin feeding. White worms are a good alternative as they remain alive in salt water for much longer than is commonly believed to be the case—often up to 24 hours after introduction.

During this period of stress, fish should be watched very carefully for disease, and if they do go off feeding en masse it could be that a mere reduction in their number will restore matters. If disease is present, copper medication may be appropriate (though not necessarily so), and this particular treatment seems not to have adverse effect on the beneficial bacteria. At all costs avoid adding a new fish just for effect when the starters have settled to their routine, as it could bring in disease, and if it is a larger specimen, might upset the others emotionally by initiating disputes over territory. In cases where all the fish 'go quiet' and refuse to take food it is probably better to offer nothing but live brine shrimp until they finally accept this: I have found that if they won't eat this they won't eat anything, so it is a complete waste of time and a dangerous practice to run through the entire menu, as the unwanted offerings will remain on the tank bottom, putrefy, and add further to your difficulties.

Readers' Queries Answered



Not Often Seen

Can you tell me something about *Cichlasoma salvini*? Is it a rare cichlid—there seems to be very little information about it available.

And regrettably we can add little to it. It rarely appears on the lists of importations, probably because it does not have so much to offer the aquarium keeper as, say, the firemouth cichlid that comes from neighbouring territory (the native habitat of *C. salvini* is south Mexico, Guatemala and Honduras). Also, the firemouth, like another cichlid from the Caribbean area, the convict or zebra cichlid, breeds well in captivity and there are plentiful supplies of home-bred firemouths and convicts. We have ourselves no experience of this fish but it is reported to grow to a length of about 5-6 in. and to be quarrelsome. As a member of the *Cichlasoma* genus it requires ample room, a high protein diet and some supplementary vegetable food such as scalded lettuce or boiled spinach.

Constant Level Siphon

I want to arrange a 'constant level siphon' on a 48 in. tank that I intend to fit up with slowly flowing water. Could I use the device shown in the diagram on p. 557 of the March issue of 1973 and if so do you know where this could be purchased?

The 'constant level' outflow shown in the diagram you mention is made up from straight tubing and 'elbows', and would be quite suitable for your purpose. If the inflow to the tank is not great, the versatile system of tubes (1 cm.), joints and elbows sold as a set in the Nuova range could be used to make up the device. Obviously any outflow system must have piping of large enough diameter to cope with the rate of inflow or else the constant level

will not be attained. The bottom of the overflow pipe inside the tank should be attached to the stem of a funnel with its opening covered with a grid of some kind, particularly if there are plants in the tank that could become detached and block the siphon.

'Cockatoo' Dwarfs

Can you please tell me if there are any special requirements that I should supply for *Apistogramma cacatuoides*?

The 'cockatoo dwarf cichlid' requires similar conditions to those in which most of the dwarf cichlids thrive, i.e. warmth (a temperature of 75°-80°F), soft, and slightly acid, clean water and plenty of hiding places in plants, rockwork or, for example, broken flower pots. Its manner is more aggressive than the timid *Apistogramma ramirezi*, and its tank companions should therefore be picked from among the medium-sized, rather sturdy fishes of unrelated species. *A. cacatuoides* requires live or frozen foods, tubifex worms, white worms, daphnia and, at this time of year, mosquito larvae are ideal.

Angels?

I have been keeping fishes now for nearly a year and have one community tank (stainless steel) 24 in. long. My problem is my angels. They are now really large compared with the other fishes and although they seem quite uninterested in these their battles with each other are driving us all mad. They back away at each other continually though they really don't seem to harm each other greatly. Is there anything at all I can do to stop this?

The beginner fishkeeper, picking out the fishes for his first community tank, can seldom resist the sight of one or two angel fish, the

size of 10p pieces, in the dealer's tanks. It has been said that it is unkind of the dealer to allow the unsuspecting novice to choose this fish. In a 24 in. tank they are going to outpace any other fish in the community in growth and they are very likely to 'fight'. There is no easy answer. Keep them in a large tank with plenty of plants where each can have its own territory, or separate them. Best of all, the dealer who sold them to you may be prepared to buy them back and replace them with fishes that will not outgrow the tank.

Lighting Difficulties

What is the best lighting with fluorescent tubes for a 48 in. by 12 in. by 12 in. community tank? At present I've two 3 ft. fluorescent warm white tubes left on for about 10 hours daily, but although the water rapidly turns green, plants such as *Vallisneria* just fade away (although *Ananas* stands about a little growth).

Unusually, the problem of the poor growth of the *Vallisneria* would seem to be that it is receiving too much light. It is extremely difficult to give a ruling about the amount of light required in any tank, but a reasonable guide to follow is that given in the *Reis Aquarist's Data*:

$$\text{Watts} = \frac{12 \times \text{length of tank (inches)}}{\text{illumination time (hours)}}$$

This is for tungsten lighting; the wattage required for fluorescent lighting is arrived at by dividing the value obtained from the above formula by 4. Substituting the details you have given, 153 watts of tungsten or 38 watts fluorescent are required for 10 hours of illumination. But the wattage of a 36 in. fluorescent tube is 36, so the tank is receiving 60 watts. Working the formula backwards, if the 36 in. tubes are to be retained, then no more than 6-6½ hours of illumination need be given. With a tank 48 in. long, however, a much better result would probably be achieved if an 18 in. fluorescent tube were to be substituted for one of the 36 in. lengths and then both tubes kept on for 8-9 hours a day.

The continual greening of the water would indicate excessive lighting (and probably some over-feeding!), and the fact that the

Amazon sword is showing growth would indicate a high degree of lighting at least. These plants require more light than Vallisneria, which in fact does rather better under only moderately strong artificial illumination. If a shorter fluorescent tube is to be substituted for one of those 36 in. long, it should be centralised over the Amazon swords so that their greater light requirements are attended to while the less illuminated parts of the tank would be used for the Vallisneria.

Incorrect water conditions, too, could be playing a part. Vallisneria prefers a slightly alkaline water of moderate hardness; Amazon swords prefer a softer, more acid water. It might be worth trying cabomba near the swords and cryptocorynes (planted in the less brightly lit areas), as these plants also fare best in conditions similar to those preferred by the Echinodorus.

Finally, possibly the Vallisneria is not being correctly planted. The crown of the root mass must not be pushed into the bottom medium. Any long roots of the plant can be wound round and pushed into the gravel, but the leaves should then be given a little tug to make certain that only the roots stay covered and the crown is clear.

Pond Liner

Can I use black polythene sheeting to make a garden pond if I use it as a double layer?

This is not to be recommended for anything other than the most temporary of arrangements. It is all too easy for holes or tears to be made in the sheet during ordinary pond servicing and usage, and very readily if there should be any out-of-the-ordinary usage! The sheeting also loses some of its resilience after a time and is then even more likely to develop leaks, something that can also easily occur with sheet polythene as the result of water-seeking tree or other plant roots growing through the soil beneath such a pond. It is far better to use one of the reinforced plastic sheets sold specially for pond use if you plan to employ this form of pondmaking, but with all liners it is necessary to take pains in the preparation of the cavity into which the sheeting is to be laid to provide a soft, even base.

AquaGLOSSARY

No. 12

A PFM guide to the meanings and accepted pronunciation of the scientific names of aquarium subjects, arranged by word-roots in alphabetical order

Aurum (Latin): gold. Pronounced 'or-rum'. Fishes with significant gold coloration may have trivial names, such as *auratus*, *aurum*, to indicate this. For example, the goldfish (*Carassius auratus*; 'kar-rass-ee-uss or-rah-tuss'), the golden cichlid (*Cichlasoma aurum*; 'sick-lah-soh-mah or-ree-um'), the marine goatfish (*Mullus auratus*; 'mull-uss or-rah-tuss') and the golden Malawi cichlid (*Pseudotropheus auratus*; 'sue-doh-troh-fee-uss or-rah-tuss').

Brama (Old French): bream. Pronounced 'brah-mah'. The scientific name of the bream *Abramis brama* ('ah-rah-miss brah-mah') in fact owes its generic name to a Nile fish known to the Greeks as *abramis* (no connection with the root *brama* used for the trivial name of the bream). The headstander (*Abramites microcephalus*; 'abra-me-tees trick-roe-keff-el-uss') represents another fish where the genus name is based on the old Greek name, and *abramites* means 'little abramis', but with no relationship at all to the bream.

Carassius. Pronounced 'kar-rass-ee-uss'. This generic name of the Crucian carp (*Carassius carassius*), Prussian carp (*Carassius carassius gibelio*; 'kar-rass-ee-uss gib-el-ee-oh') and goldfish (*Carassius auratus*; 'kar-rass-ee-uss or-rah-tuss') is unusual in being formed by latinising a Danish word for the fish (*karusse*).

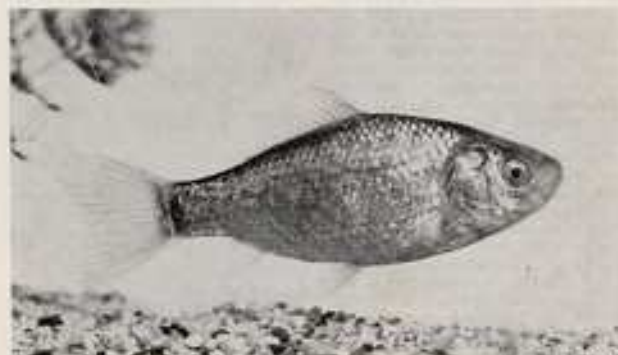


Photo: W. J. HOWES
Crucian carp (*Carassius carassius*)

Dolicho (Greek): long. Pronounced 'doll-ick-oh'. In the blue chin catfish *Xenocara dolichoptera* ('zen-no-kar-ah doll-ick-oh-terr-ah') the specific name means literally long fin (*ptero*, Greek: wing, fin).

Versicolor (Latin): variegated, changing colour. Pronounced 'ver-see-col-or'. For example, *Lama versicolor* ('lim-mee-ah ver-see-col-or').



FBAS Basic Show Class Letters:

A, furnished aquaria and aquascapes; B, Barb; C, characin; D, cichlid; E, labyrinth; F, egg-laying toothcarps; G, tropical catfish; H, Corydoras and Brochis; J, rasbora; K, danio and W.C.M.M.; L, loach; M, a.o.s. tropical egg-layers; N, pairs of fish; O, guppy male; P, guppy female; Q, swordtail; R, platy; S, mollie; T, a.o.s. livebearer; U, singletailed goldfish; V, twintailed goldfish; W, a.o.s. coldwater; X, breeders' classes; Y, marine fish; Z, plants.

SHOW Secretary of HENDON & DAS, Mr R. S. Thompson, reports, 'Over the past few months Hendon DAS have been engaging in a series of successful and light-hearted challenge matches or social gatherings with other societies. 19th April saw a return match with old rivals—Uxbridge. The table show saw Hendon convincingly beaten by an Uxbridge team with strength in depth, Uxbridge scoring 912 points, Hendon 878½. (1, Mr D. Ricketts, Uxbridge, 81; 2, Mr P. Ginger, Uxbridge, 80; 3, Mr R. S. Thompson, Hendon, 79½). The quiz resulted in what might have been a dead heat, but dubious scoring and decisions by quizmaster Mr K. Purbick made any decision unrealistic. A future warning for other clubs—*Morulus laevis* is not a variety of *labeo* but the scientific name for dry rot! 17th May and the turn of Sudbury and East London A & P. Again some dubious adjudicating saw Hendon in their true position—last behind Sudbury and East London. No amount of fiddling could alter the results in the table show however—Hendon 886½; Sudbury 868; and East London 860 (1, Mr H. Watts, Hendon, 79; 2, Mr J. Smith, Sudbury, 78; 3, Mr R. Thompson, Hendon, 77½). Hendon would like to thank everyone for their support and in particular Mr D. Lambourne and Mrs P. Baynton, the two judges'.

FOURTEEN FBAS-affiliated societies took part in the annual inter-club show organised by **PORTSMOUTH AS** on Spring Bank Holiday Sunday, and final placings were: Rochester (22) winners of shield; Basingstoke (20); Portsmouth (15); Salisbury (14); Havant (11); Gosport (8); Kingston (7); Newbury (7); Southampton

(5); Reading (4); Freelance (3); Brighton (3); Littlehampton (1) and New Forest (0). Whilst the fish were being judged by FBAS judges Mr R. D. Esson, Mr P. Ginger and Mr I. Mathieson, a programme of films was shown, including the extremely interesting BBC Horizon 'Making a Natural History Film'. The Society look forward to welcoming many of their previous guests to their 21st Open Show at the new venue of St Patricks Hall, Winter Rd., Southsea, Portsmouth, 4th-11th August. Schedules are available from show secretary Mr J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, PO3 6LD.

NEW secretary of the GOLDFISH SOCIETY OF GREAT BRITAIN is Mrs M. Dudley, 163 South Park Road, Wimbledon, London, SW19 8RX (phone: 01-540-5662).

JUDGES Mr I. Woods, Mr B. Pengelly and Mr H. Cooper had 409 entries to consider at the **NORTH-WICH & DAS 5th Open Show**. Major prize-winners were: Thorne trophy, Best Fish in Show, B. & B. Booker (Morecambe Bay); Russel Allan trophy, Best Livebearer, B. & C. White (Leigh); Benoy trophy, best breeders' Exhibit, Mr & Mrs A. Thomas (Independent); Hyland trophy, Best Catfish, botias, loach, Mrs D. T. Armour (Ellesmere Port); Harry Buckley trophy, best coldwater, L. & D. Thorne (Northwich); Interpet trophy, Society gaining most points, Northwich; King British trophy, Northwich member gaining most points, L. & D. Thorne. Remainder of results:

Guppies: 1, Mr R. Darby (Hyde, 72); 2, Mr P. Hall (Runcorn, 70); 3, C. & H. Davies (Northwich, 68). Swordtails: 1, Mr P. Walker (Northwich, 78); 2, Mr R. Darby (70); 3, Mr R. Knowles (Northwich, 68). Mollies: 1, Mr Perkie (Macclesfield, 74); 2, Mr B. W. Carter (71); 3, Mr K. Allerton (Grimwood, 69). Platys: 1, B. & C. White (Leigh, 71); 2, Mr W. D. Hadow (Hyde, 74); 3, Mr R. Knowles (69). Small barbs: 1, Mr K. Wright (Sandgrounders, 72); 2, B. & C. White (78); 3, Mr T. Sinclair (Northwich, 69). Large barbs: 1, Mr B. W. Carter (Merseyside, 74); 2, Mr R. I. Payne (Merseyside, 72); 3, L. & D. Thorne (68). Small characins: 1, L. & D. Thorne (78); 2 & 3, Mr B. Sumner (Sandgrounders, 77 & 76). Large characins: 1, B. & B. Bicker (Morecambe Bay, 80); 2 & 3, Mr R. Walker (78 & 76). Fighters: 1 & 2, Mr L. Rascliffe (Leigh, 71 & 67); 3, Mr R. Weston (Mersey-

side, 66). Small anabantids: 1, Miss J. Gullane (Iluxton, 75); 2, Mr D. Taylor (Macclesfield FS, 72); 3, Clarke Bros. (North Staffs, 60). Anabantids aov: 1, Mr P. S. Godgeon (Hyde, 75); 2, Mr R. Harlow (Derby, 74); 3, Mr S. Hector (Sandgrounders, 72). Angels: 1, Mr G. Walker (Hyde, 78); 2, Mr C. Bull (Derby, 60); 3, Mr M. D. Valentine (Northwich, 63). Dwarf cichlids: 1, Mr W. D. Hadow (73); 2, Miss J. Gullane (72); 3, L. & D. Thorne (71). Cichlids aov: 1 & 3, Mr S. Hooton (Sandgrounders, 75 & 70); 2, Mr G. Wilkinson (74).

Danios and minnows: 1, Mr P. Floyd (Northwich, 74); 2 & 3, L. & D. Thorne (72 & 70). Rasbora: 1, Mr L. Bradley (Northwich, 78); 2, Mr T. Sinclair (77); 3, B. & B. Booker (75). Sharks: 1, Mr R. Harlow (70); 2, Mrs D. T. Armour (Ellesmere Port, 78); 3, Mr T. Hampton (Merseyside, 77). Flying foxes: 1 & 2, Mr J. Hall (Runcorn, 71 & 70); 3, Miss J. Gullane (68). Catfish Corydoras: 1, B. & C. White; 2, Miss J. Gullane (74); 3, Clarke Bros (73). Catfish aov: 1, Mrs D. T. Armour (79); 2, Mr A. Waterhouse (Sandgrounders, 73); 3, L. & D. Thorne (70). Loaches & botias: 1, Mr R. Walker (72); 2, Mr & Mrs Prichard (Wrexham, 70); 3, Mr K. Thomas (Luzon, 69). Toothcarps: 1, 2 & 3, Mr T. Sinclair (75, 74 & 73). aov Tropical: 1, Mr Allerton (70); 2, Mr G. Taylor (69); 3, Mr A. Waterhouse (68). Pairs livebearers: 1, Mr B. Sumner (74); 2, Mr H. Buckley (72); 3, Mr G. Kaye (Top Ten, 70). Pairs aov: 1, B. & C. White (77); 2, Mrs C. Bull (74); 3, Mr R. Knowles (71). Breeders livebearers: 1, Mr R. Waterhouse (76); 2, Mrs B. Kaye (Top Ten, 74); 3, Mr R. Knowles (73). Breeders egg-layers: 1, Mr & Mrs A. Thomas (Independent, 77); 2 & 3, Mr F. Thorne (Village, 76 & 74). Goldfish, common: 1, Mr & Mrs Brody (Village, 76); 2 & 3, Mr B. J. Holroyde (Morecambe, 75 & 71). Goldfish, fancy: 1, Mr M. Whalen (N. Staffs, 70); 2, Mr H. Buckley (Northwich, 64); 3, Mr A. Thomas (62). Coldwater aov: 1, L. & D. Thorne (77); 2, Clarke Bros. (75); 3, Mr Allerton (70). Junior livebearers: 1, Master D. Holroyde (Morecambe, 73); 2, Master G. Wilkinson (Hyde, 72); 3, Miss S. Goddard (70). Junior egg-layers: 1, Master W. L. Booker (Morecambe, 77); 2, Master A. Wild (Accrington, 75); 3, Master E. Armond (Ellesmere Port, 72). Furnished mini jar: 1 & 2, Mrs A. Wild (Accrington, 75 & 74); 3, L. & D. Thorne (70).

MR DIXON, P.R.O. of REIGATE & REDHILL AS, reports on recent club activities: 'In April, Reigate & Redhill AS received a return visit from the Nomads of Caterham for an interclub table show. Classes were—labyrinths, aov livebearers, *Corydoras* & *Brochis* and characins, and Normads achieved a clear win over the home team. Unfortunately the intended programme of activities fell through, but both clubs had an enjoyable evening and got to know each other better over abundant refreshments. At the following meeting, Mr I. Dixon and Mr S. Perham, alias "Woodland Productions", provided a preview of their newly made slide and tape lecture "Let's chat about Furnished Aquaria". This was followed up at a later date by attempts from members to set up small furnished aquaria under the eye of our expert Mr B. Leach. Unfortunately there appeared to be something of a plant shortage, and the contents of some of the tanks were novel, aquatic wise, to say the least. It looks as if the

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AQUARIUM
FERTILIZER TABLETS

Society could do with a bit of study on plant growing too! The latest meeting was again an interclub show, with a comparatively new club, Haselmere, who arrived literally by the coach load. Whilst judging took place, Mr D. Park talked about the chemistry of water, and the two Societies had some interesting comparisons drawn on their differing water supplies. Show classes were dwarf cichlids, nov cichlid, *Corydoras* & *Brochis*, and barbs. This time Reigate came out on top.

A SPECIAL meeting for members only of the **BRITISH AQUARISTS STUDY SOCIETY** was held on Sunday, 10th June at the Ratcliffe-on-Soar Power Station. The CEG Board is carrying out research on aquatic environmental studies and there were films and talks on this work. The results of this research concerning fish growth was of special interest to members. The group toured the power station and the meeting ended with tea at the home of members Mr & Mrs J. Williams.

AT the **FREELANCE AS** Open Show the best junior was Master D. Elson; best lady, Mrs Coyle; best club, Freelance AS; best fish in show, Mr A. Kinsey (Independent AS). Remainder of the results were:

Furnished aquaria: 1, Mrs B. Cowell (Winton); 2, Mr R. Burton (Freelance). Aquascapes: 1, Mr S. Cowell; 2, Mr T. Batts (Ealing); 3, Mrs M. Miller (Freelance). Barbs: 1 & 2, Mr R. Leslie (High Wycombe); 3, Mr A. E. Williams (Freelance). Characins: 1, Mrs P. Coyle (Independent); 2, Mr P. W. Coyle (North Kent); 3, Mr J. Batts. Cichlids: 1, Mr A. Kinsey; 2, Mr P. D. Elson; 3, Mr P. Coyle. Dwarf cichlids: 1, Mr P. Moya (Betchley); 2, Mr R. Bowes (Independent); 3, Mr A. E. Williams (Freelance). Labyrinth: 1, Mrs B. Scates (North); 2, Mr G. Elson; 3, Mr S. Cowell (Freelance). Tropical: 1, Mr K. E. Usher (Anson); 2, Mr C. Thomas (Walhampton); 3, Mr K. A. Beadle (Erith). Tropical cats: 1, Mr K. A. Beadle (Erith); 2, Mr R. Bowes; 3, Mr W. F. Sutton. Tetras: 1, Mr R. Wright (East Dulwich); 2, Mrs D. Winder (East Dulwich); 3, Mr T. Batts. Barbora: 1, Mrs M. Stamp (Freelance); 2, Mr G. Mason (Roehampton); 3, Mr S. Mason (Roehampton). Danio & minnows: 1, Mr K. A. Beadle; 2, Mr J. Warner (Freelance); 3, Mr P. Coyle. Loach: 1, Mr & Mrs Martin (North Kent); 2, Mr L. Leslie (High Wycombe); 3, Mr T. Batts. 100 Tropical: 1, Mrs R. Coyle; 2, Mr G. Mason; 3, Mr B. Robinson (Lewisham). Purr: 1, Mr L. Brazier; 2, Mr P. W. Coyle; 3, Mr T. Batts. Male guppy: 1 & 2, Mr & Mrs Murphy; 3, Mr K. E. Usher. Female guppy: 1, Mrs J. Chandler (Runnymede); 2, Mr R. Bowes; 3, Mr K. E. Usher (Anson). Swordtails: 1, Mrs A. M. Adams (Hastings); 2, Mr M. Lewis (Sudbury); 3, Mr G. Mason. Platy: 1, Mr G. Smith (Walhampton); 2 & 3, Mr A. R. Chandler (Walhampton). Mollies: 1, Mr G. Mason; 2, Mr A. Heath; 3, Mr A. R. Chandler. 100 Livebearers: 1, Mr D. Stratford (Kingston); 2, Mr R. Wright; 3, Mr A. Heath. Singletail goldfish: 1, Mrs M. Pinder (GSGB); 2, Mr I. Fleming (GSGB); 3, Mr F. Pinder (GSGB). Twin-tailed goldfish: 1 & 2, Mr A. Lawman

FEDERATION



NEWS

New FBAS Programme Aids for Societies

BEING ever mindful of societies' problems, and its responsibility to try and solve them, the Federation of British Aquatic Societies is producing a series of Tape/Slide Lectures. These will bring to the societies a new feature with which to fill those 'difficult' evenings, plus less wear and tear on the lecturers' legs and tonsils! It also means that the more outlying affiliated societies can now 'meet' the voices (at least!) behind the names, and benefit from these excellent speakers who are usually heavily booked by societies nearer to the speakers' homes.

The first three lectures are now available and are 'Non U' Goldfish' by R. D. Esson, 'Why Corydoras?' by C. A. T. Brown, and 'Barbs' by P. Ginger. Running times are approximately 45-60 minutes with a built-in interval for the traditional refreshment session. The programmes come complete with slides, tape and full instructions. The hiring fee is £2.00 to Federation-affiliated societies—rates to other societies available upon application. Bookings will be dealt with in strict rotation, and societies are especially asked to co-operate by the prompt return of programmes—there is probably another society waiting. A second choice of subject and date would be appreciated when booking is made.

Further details and hiring bookings from Mr R. C. Mills, 70 Lee Road, Perivale, Middlesex UB6 7DB. Cheques, P.O.s etc. payable to the FBAS please.

The availability of new titles will be announced shortly and will include 'Labyrinth', 'Aquarium Plants', 'A.O.S. Catfish' and 'Angel fish'.

Championship Class Show Results

Croydon	Cb	Mr L. J. Brazier (Sudbury)
Riverside	Da	Mr John Batts (Ealing)
Corby	Db	Mr W. Hickman (Dudley)
Southend, Leigh	Dc	Mr D. M. Dare (Independent)
Vauxhall Motors	Ea	Mr A. Taylor (Sudbury)
Half Moon	Ez	Mr D. Keighley (Stockton)
Roehampton	G	Mr D. Lambourne (Roehampton)
Independent	H	Mr W. D. Wright (E. Dulwich)
Port Talbot	J	Mr E. Earnshaw (Taunton)
Medway	L	Mr J. Parker (N. Kent)
Havant	Mz	Mr R. Halsey (Basingstoke)
Llantwit Major	U	Mr & Mrs W. P. Johnson
Uxbridge	Xo-p	Mr R. Newman (Uxbridge)
Yeovil	Xu-w	Mr D. S. Langdon (Yeovil)

Forthcoming Championship Class Shows

4th-11th August	Portsmouth AS	Xo-p	Breeders
5th August	Tonbridge AS	Ba	
30th August	Northampton AS	Ca	Hyphessobrycon etc.
2nd September	Bethnal Green AS	Cz	
2nd September	Wellingborough AS	O	Guppy, male
8th September	Reading-Didcot-Bracknell	K	Danio & minnows
9th September	Harlow AS	Q	Swordtails
9th September	Newbury AS	Bz	
15th September	Hounslow & DAS	R	Platys
23rd September	Torbay AS	W	Native & foreign
23rd September	North Kent AS	Xb-m	Breeders
6th October	E. London A & PA		
7th October	Ealing AS	S	Mollies
28th October	Newcastle Guppy & L/BS		

(GSGB); 3, Mr W. F. Woodhead (Preston); 4, Mr C. J. Mason (Kington); 5, Mr D. E. Goodbody (Waltham); 6, Mr C. Thomas (Brederley); 7, Mr D. M. Moye (Blandford); 8, Mr T. B. Adams (Bosham); 9, Mr P. W. Corb; 10, Mr B. C. Fry; 11, Mr K. E. Usher.

NEWS from HASTINGS & ST LEONARDS AS illustrates the varied and interesting activities members of a thriving club enjoy. Recent lectures on the club's meeting nights at the Conservative Offices, Cornwallis Gardens, have included one by Mr G. Pryke on beginning an aquarium that covered both the very latest tanks and the first types of all with slate bottoms and heating by Bunsen burners. Mr G. Pryke lectured on fishes he had bred, and an interesting lecture by Dr Neville Carrington of Interpet described his recent Far Eastern tour and developments in the hobby there. 23 members journeyed to Bexhill for an inter-club show with Tonbridge and Bexhill societies (which Tonbridge won with 16 points) and heard a talk by Mr J. Burtles of Mid-Sussex AS on native marines. Club member Mr P. Stapley was very successful at the Littlehampton & Bognor AS Open Show, achieving a first for rainbow, second for cichlids and third for breeders team.

The Society have recently been delighted to meet two committee members from Hamilton & DAS, Ontario, Canada, Mrs Audrey Andrews and Mr Don Macpherson were able to accompany the club on their trip to Bexhill for the inter-club competition there to meet members of all three societies and exchange views and news.

560 ENTRIES were benched from 21 different societies at the **SOUTH-END, LEIGH & DAS** Open Show. Trophies were presented by the Pearly Queen of Fishery as follows: Best livebearer trophy, Mr J. Murphy; Best Junior exhibit, T. Hodges; Club Championship trophy, Thurrock AS; Best Coldwater Fish trophy, Mr R. Parker; Best Whitecloud trophy, Mr D. C. M. Durrant; Best Breeders trophy, Mr T. Wooley; Best in Show trophy, Mr J. Batta. Detailed results were:

As: 1 & 2, SLADAS, Ak: 1, Mr E. Booth; 2, Mr K. Appleyard (Thurrock); 3, Mr R. Wall (Thurrock); Am: 1, Mr J. Batta (Salting); 2, Mr J. Salisbury (Harrow); 3, Mr K. Appleyard; B: 1, Mr S. Mason (Boshampton); 2, Mr G. Cox (SLADAS); 3, Mr B. C. Fry; Bk: 1, Mrs R. Corb (Ips); 2, Mr H. Burtles (SLADAS); 3, Mrs H. Corb; C: 1, Mr D. Dave (Ips); 2, Mr P. Coyle (Ips); 3, Mr B. Fenwick; Ck: 1, Mr P. O'Brien (Thurrock); 2, Mr G. H. Gilham; 3, Mr J. Salisbury; Cl: 1, Mr J. London (Thurrock); 2 & 3, Mr K. Adams (SLADAS); D: 1, Mr J. Batta; 2, Mr K. Adams (SLADAS); 3, Mr J. Burtles (Mid-Sussex); Dk: 1, Mr E. Booth; 2, Mr R. Knox (Havy. St. Ed.); 3, Mr C. J. Martin (N. Kent); Dk: 1, Mr

NEXT TIME ASK

FOR

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FISH FOOD

A. Tuffin (SLADAS); 1, Mr V. C. Green (Suffolk); 2, Mr P. Vicker (SLAP); Dk: 1, Mr D. Dave; 2, Mr V. Valley (Salting); 3, Mr J. Burtles; E: 1, Mr S. Hodges (Boshampton); 2, Mr P. Coyle; 3, Mr J. London; Ee: 1, Mr B. C. M. Durrant (SLADAS); 2, Mr G. Wickham (SLADAS); 3, Mr T. Wooley (Harrow); Fb: 1, Mr J. Batta; 2, Mr S. Jordan (Harrow); 3, Mr P. O'Brien; Fc: 1 & 2, Mr K. Adams; 3, Mr D. Dave; G: 1, Mrs P. Lambourn (Thurrock); H: 1, Mrs P. Lambourn; 2, Mr J. Batta; 3, Mr W. Burton (Greenham); J: 1, Mr S. Mason (Boshampton); 2, Mr K. Adams; 3, Mr P. O'Brien; K: 1 & 2, Mr P. O'Brien; 3, Mr G. Cox; L: 1, Mr C. J. Martin; 2, Mr W. Sutton; 3, Mr D. Knox (Havy. St. Ed.); M: 1, Mrs S. Hodges; 2, Mr R. Corb; 3, Mr J. London; N: 1, Mr J. Salisbury; 2, Mr D. Lambourn (Boshampton); 3, Mr J. Batta; Nk: 1, Mr A. Heath (Lewisham); 2, Mr J. Preston (SLADAS); 3, Mr B. Robinson.

O: 1, Mr J. Murphy (Greenham); 2, Mr B. C. Fry; 3, Mr K. Adams (SLADAS); P: 1, Mr A. Tuffin; 2, Mr P. Coyle; 3, Mr J. Durrant; Q: 1 & 2, Mr P. O'Brien; 3, Mr D. Lambourn (Thurrock); R: 1, Mr K. Adams; 2, Mr T. Wooley; 3, Mr P. O'Brien; S: 1, Mr R. Robinson; 2, Mr J. London; 3, Mr D. Durrant; T: 1, Mr J. Preston (SLADAS); 2, Mr B. Fenwick; 3, Mr D. Chiswright (SLADAS).

U: 1 & 2, Mrs S. Hodges; 3, Mr K. Adams; V: 1 & 2, Mr Lawson (GSGB); 3, D. Chiswright; W: 1, Mr B. Parker (N. Kent); 2, Mrs S. Hodges; 3, Mr B. C. Fry; X: 1, Mr G. Cox; 2, Mr J. Burtles; 3, Mr P. Vicker; Xk: 1, Mr T. Wooley; 2, Mr R. Orford (SLADAS); 3, Mr K. Appleyard; Y: 1, 2 & 3, Mr A. Tuffin; Z: 1, Mr D. C. M. Durrant; 2, Mr P. O'Brien; Mr D. Knox; Zk: 1 & 2, Mr A. Tuffin; 3, Mr D. Durrant; Junior tropical: 1, R. Wylie (SLADAS); 2, T. Coyle (Ips); 3, C. Chiswright (SLADAS); Coldwater: 1, 2 & 3, T. Hodges (Boshampton).

AUCTIONEER/committee member Mr K. Upton had plenty to auction at the **BEDWORTH A & PS** being and buy sale. To encourage more members to show fish the table show for the evening was split into two sections, A and B, with an A-class exhibit being one who has taken more than three 1st awards since January 1972. Results were: av barb, A: 1 & 2, Mr J. Salisbury; 3, Mr & Mrs Lee; B: 1 & 2, Mr J. T. Dawson; 3, Mr T. Allen; av Louch, A: 1 & 2, Mr J. Salisbury; 3, Mr D. White; B: 1, Mr T. Allen; 2, Mr R. Shakespeare; 3, Mr T. Emma; Livebearer pairs, 1: 1, Mr D. White; 2 & 3, Master C. Pratt; B: 1, Mr &

BEDWORTH AQUARIST & POOL SOCIETY would like to exchange copies of newsletters with other societies at home and abroad. Will interested club secretaries please contact chairman Mr M. H. Carter at 1 Culworth Court, Foleshill, Coventry.

Mrs Carter; 2, Mr T. Allen; 3, Mr R. Shakespeare; av Rainbow, A: 1 & 2, Mr D. White; 3, Mr J. Salisbury; B: 1 & 2, Mr K. Pratt; 3, Mr T. Allen.

MID-SUSSEX AS report: 'Mid-Sussex AS pride themselves on being forward-thinking and full of bright ideas. For some years now they have held an annual Fish Exhibition in which members display their hobby to the general public on a non-competitive basis. Chairman of the society, Mr Robin Johnson, maintains that this event does more to encourage interest in our hobby than all the Open Shows put together. An exaggerated claim, you may think, but there is more than a grain of truth in it. This year nearly 2500 members of the public visited the Park Centre, Burgess Hill on Sunday 27th May to see a wide range of aquarium displays. Support for this venture was an encouraging that the Exhibition Manager, Mr D. Soper, looks forward to a 2-days exhibition next year. He says 'the hall is already booked for Bank Holiday Sunday and Monday—all we have to do now is put on a bigger and better display, if that's possible. The main item at this year's exhibition was, of course, the introduction of the world's first Crab Derby which attracted a great deal of attention from not only the local but also the national press. Perhaps the major publicity was when the crabs appeared on Blue Peter; this preview event was won by Puddle Jumper scuttling down the 1600 mm course cheered on by the Blue Peter team. In the main event of the day the tables were turned when Sidewalk won the first ever World Championship in 20 secs flat. His trainer, Mr J. Burtles, said, 'this was not a particularly fast race, more tactics than a flat-out sprint. He has beaten 12 secs. in training.' Crab racing is likely to become quite a popular sport as the Mid-Sussex stable have already received a number of invitations to appear at various functions up and down the country. For the technically minded, the crabs used are common shore crabs (*Carcinus maenas*) fed on a diet of raw ox heart and prawns. The next championship is scheduled to take place next year over the Spring Bank Holiday and is open to anyone bringing their own crabs.'

BEST fish in show at the **BISHOP'S CLEEVE AS** Open Show was a *Syngnathus spicifer* entered by Mr J. Salisbury of Bedworth AS. 210 fish were benched and detailed results were:

Class 1: 1, Mr G. V. Ludlow; 2, Mr Atwood & Mr Williams; 3, Mr P. Green-

wood, 2: 1, Mr & Mrs Carrer; 2, Mr Atwood & Mr Williams; 3, Mr P. Greenwood; 4, Mr R. Shakespeare; 5, Mr C. Pratt; 6, Mr D. Sullivan; 7, 1 & 2, Mr B. R. Gull; 8, Mr A. Gosson; 9, 1, Mr D. R. Phippen; Mr R. Hall; 3, Nigel Gray; 4, 6, Mr C. Turner; 5, Mr R. Gull; 6, Mr S. Farsons; 7, 1 & 2, Mr A. Hilland; 2, N. Gray; 8: 1, Mr A. Hilland; 2 & 3, Mr B. R. Gull; 9: 1 & 2, Maize J. Edwards; 3, Mr J. P. Hughes; 4, 5, Mr J. Rice; 6, Mrs V. Russell; 7, Mr C. Turner.

Class 11: 1, Mr M. Strang; 2, Mr P. Greenwood; 3, Mr Atwood & Mr Williams; 4, 1 & 2, Maize M. Lovell; 5, Mrs L. Strang; 6, 1 & 2, Mr D. Phippen; 7, Mrs D. Daniels; 8, 1, Mr G. Ludlow; 2, Mrs V. Russell; 3, Mr J. Rice; 4, 1 & 2, Mr Y. Humphreys; 5, Nigel Gray; 6, 1 & 2, Mr McQuade; 3, Kevin Daniels; 4, 1, David Sullivan; 2, Mr A. Faulkner; 3, Mr P. Russell; 4, 1 & 2, Nigel Gray; 5, Mr B. Webb; 6, 1, Mr B. R. Gull; 2, Mr C. Turner; 3, Mr A. Faulkner; 4, Mr J. Salisbury; 5, Mr A. Hilland; 6, Mr A. Hilland; 7, Mr C. Turner; 8, Mr G. Ludlow; 9, Mr C. Turner; 1, Mr B. R. Gull; 2, Mr C. Turner; 3, Mr J. Hall; 4, Mr T. Humphreys; 5, Kevin Daniels; 6, Mr D. Phippen; 7, 1, Mr A. Faulkner; 2 & 3, Mr B. Shakespeare; 4, 1, Mr C. Pratt; 2 & 3, Mr S. Farsons; Extra class: scabbard trout, 1 & 2, Mr Bradley; 3, Mr Atwood & Mr Williams.

RECENT activities of WREXHAM TFS have included a slide show and a display of ten very excellent model tableaux made by members (Mr R. Mathers' model 'Big Wheel' was voted the winner). A team quiz, organised by Mr J. M. D'Arcy, with all the members present taking part, was won by the team led by Mr B. Roberts, pipping the team of Mr T. Pound on the post. The fish show, judged by Mr C. Pritchard, brought the juniors out in force, and they swept the board in the danios class with D. Jones (showing for the first time) coming 1st, and B. Roberts and 2nd. Other results were: ruboras: 1, Mr G. Roberts; 2 & 3, Mr T. Pound. Minnows: 1, 2 & 3, Mr E. Jones.

HAVANT & DAS held its 3rd open show at St George's Hall, Waterlooville and a record number of entries (473) was received. The most successful exhibitor, particularly as he was only able to enter one fish, was Mr R. Hsley of Basingstoke; with a *Polypterus ornatipinnis* he won the Best Fish in Show trophy, the FRAS Championship trophy for AOS trophy egg-layer and the John Dickinson Cup. Other trophy winners were: Mr R. Adams (Salisbury), Dittman & Malpas Cup for best livebearer and H & DAS Cup for best coldwater fish; Mr F. Willis (Portsmouth), John Taylor Cup for best breeder and Janet Holford Cup for best dwarf cichlid; Mr E. Binwood (Portsmouth), John Taylor Cup for best sunfish and Vernon Hunt cup for best twinstailed goldfish; Mrs J. Vincent (Southampton),

THE BRITISH KILLIFISH ASSOCIATION feel it may be helpful to club secretaries to know that the Association have the following Tapes and Slide shows available: 1, Top and Switch Spawners; 2, Peat Divers; 3, Soil Spawners; 4, Rivulus species; 5, Killifish Egg Development; 6, Fish House Construction; 7, Trip to Ghana. These are available from: Services Secretary B.K.A., Mr P. Bolton, Highcroft, 11 Bill Street, Upper Gornal, Dudley, Worcestershire DY1 2DE. All correspondence regarding the above should be addressed to him; an i.c.e. would be appreciated.

H & DAS Barb Cup; Mr J. Pollard (Kingst.,); H & DAS Characin Cup; Mr K. Taylor (Havant); H & DAS Catfish Cup; Mr K. Groves (Mid-Sussex), Ken Taylor Cup for best Rib Valley cichlid; Mr L. Little (Bracknell), Peter Sparshott Cup for best pair of fish; Mr P. Watt (Havant), Norman Fisher Cup for best danio or WCMM; S. & H. Parrish (Hounslow), H & M Cup for best labyrinth; Mr S. Crafter (Havant), John Taylor Cup for best loach. Overall results as follows:

Ads: 1, Mrs D. Booker (Havant); Aq: 1, Miss J. Booker (Havant); 2, Mr M. Huston (Havant); B: 1, Mrs J. Vincent (Southampton); 2 & 3, Mr A. Marshall (Basingstoke); C: 1, Mr L. Little (Bracknell); 2, Mr J. Clark (Gosport); 3, Mr K. Clements (Basingstoke); G: 1, Mr J. Pollard (Kingst.); 2, Mr D. Jones (Southampton); 3, Mr P. Sparshott (D.); 4, Mr M. Cox (Gosport); 5, Mr F. Willis (Portsmouth); 6, Mr J. Hughes (Basingstoke); D: 1 & 2, Mr F. Willis; 3, Mr J. Dickinson (Havant); D: 1, Mr K. Groves; 2, Mr A. Houghton (Gosport); 3, Mr J. Hughes; D: 1 & 2, Mr M. Frennville (Gosport); 3, Mr P. Brown (Southampton); E: 1, Mr M. Frennville; 2, Mr F. Pink (Unattached); E: 1, S. & H. Parrish; 2 & 3, Mr D. Mackay (Kingst.); F: 1 & 2, Mr M. Cox; 3, Mr A. Houghton; G: 1, Mr K. Taylor; 2, Mr J. Dickinson; 3, Mr J. Hughes (Basingstoke); H: 1, Mr N. Taylor; 2, Mr J. Pollard; 3, Mr J. Hughes; I: 1 & 2, Mr A. Hantsworth (Basingstoke); 3, Mr & Mrs L. Carrer (Basingstoke); K: 1, Mr P. Watt (Havant); 2, Mr D. Mackay; 3, Miss J. Lambell (Portsmouth); L: 1, Mr S. Crafter (Havant); 2, Mrs P. Newbury (Southampton); 3, Mr J. Dickinson (Havant); M: 1, Mr H. Pratt; 2, Mr J. Hughes; 3, Mr D. Huston (Havant); N: 1, Mr R. Hsley (Basingstoke); 2, Mr & Mrs L. Carrer; 3, Mr L. Little (Bracknell); N: 1st: 1, Mr W. Ryder (Portsmouth); 2, Mr D. Jones; 3, Mr A. Houghton; N: 1) 1 & 2, Mr L. Little; 3, Mr A. Marshall jnr. (Basingstoke); O: 1 & 2, Mr C. Bevis (unattached); 3, Mr K. Foster (Havant); P: 1, Mr P. George; 2, Mr P. Brown; 3, Mr A. Layton; Q: 1, Mr

P. Bould; 2, Mrs M. Bould; 3, Mr D. Parker; R: 1, Mr B. Adams; 2, Mr H. Pratt (Hounslow); 3, Mr N. Dixon; S: 1, 2 & 3, Mr N. Davis; T: 1, Mr A. Marshall jnr.; 2, Mr L. Little; 3, Mr M. Strang; U: 1, Mr R. Adams; 2, Mr R. Little; 3, Mr R. Rich. Urd; 4, Mr B. Adams; 5, Mr D. Stokes (Portsmouth); 6, Mr P. Stevens (GSGP); V: 2: 1, Mr E. Binwood (Portsmouth); 2, Mr D. Stokes (Portsmouth); 3, Mr B. Rich. Urd; 4, Mr D. Stokes; 5, Mr E. Binwood; W: 1, Mr E. Binwood; 2, Mrs M. Dwyler (SPAAS); 3, Mr V. Hutz (Havant); W: 1, Mr D. Stokes; 2 & 3, Mr V. Hutz; X: 1, Mr F. Willis (Portsmouth); 2, Mr R. Lewis (Gosport); 3, Mr D. Jones; X: 1, Mr L. Little; 2, Mr P. Bould (Basingstoke); 3, Mr N. Davis; X: 1, Mr C. Best; 2, Mr A. Marshall jnr.; 3, Mr P. Bould; X: 1, Mr A. Marshall jnr.; 2, Mr D. Stokes; Y: 1, Mr D. Haines (Gosport); 2, Mr M. Strang; Y: 1, Mr J. Lambell; 2, Mrs D. Booker; Z: 1 & 2, Mr J. Hughes; 3, Mr W. Ryder (Portsmouth).

MR V. A. GIBSON, secretary of CATERHAM NOMAD AC writes: 'On 5th June last we had a very interesting slide show taken at various open shows by Mr P. Ginger. As always happens when one is being entertained so well, the evening just wasn't long enough and it is hoped that we can have Mr Ginger back again so we can see the rest of the slides. On 19th June we had an unusual slide show about the inmates of Indiana State Prison, U.S.A., which just goes to show how irresistible the urge to keep fish is'. There is another slide show evening lined up and there is plenty of room for new members to come and join.

A *Diatichosha oxyrinchus* entered by Mr R. C. Roberts was the best fish in show at this year's LOUGHBOROUGH & DAS Open Show. Entries were doubled this year, and the society with the most entries and points was Bedworth. Remainder of results:

Fishies: 1, Mr F. Underwood (SPA Dissington); 2, Mr Gillespie (Cauldwell); 3, Mr K. Bates (Hickling); 4, Mr A. Roberts; 5, Mr R. Shakespeare (Bedworth); 6, Mr E. Pratt (Bedworth); 7, Mr J. A. Clifton (Luton); 8, Mr B. Jeff (AAJAS); 9, K. & H. Blades (Cresswell); 10, Mr A. Clarke (Duckley); 11, Mr B. Hsley (Havant); 12, Mr J. Salisbury; 13, Mr M. Bates; 14, Mr J. Gillman; 15, Mr W. Williams (Hilary Select); 16, Mr L. Garside (Luton); 17, Mr & Mrs D. Ball (Cresswell); 18, Mr Montgomery (Dad); 19, Mr C. White; 20, Mr B. Todd (Bedworth); 21, Mr & Mrs Shipman (Gosport); 22, K. & H. Blades; 23, Mr A. Ball; 24, Mr T. Hughes; 25, Mr T. Saunders (BKS); 26, Mr H. Richardson (LADAS); 27, Mr K. Pratt (Bedworth); 28, Mr Tomlinson (Chatterfield); 29, Mr & Mrs Brodie; 30, Mr Williams; 31, Mr R. Brent (N. Staffs); 32, Mr B. C. Roberts (Dad); 33, Mr Massey; 34, Mr C. Sadler (Robey Select); 35, Mr C. Pratt; 36, Mr T. Pary; 37, Mr C. Pratt; 38, Mr Massey; 39, Mr Gillespie; 40, Mr & Mrs Foster; 41, Mr & Mrs Carter; 42, Mr & Mrs Carter; 43, Mr R. S. Elliot (Corby); 44, Mrs C. Ball; 45, Mr Williams; 46, Mr Characin; 1 and best in show: Mr B. C. Roberts; 2, Mr R. Todd; 3, Mr B. Haslow (Dunby Regent); 4, Mr & Mrs Lovebear; 5, Mr T. Allen (Bedworth); 6, B. & F. Hunt (Coventry); 7, Mr T. Saunders (CRN); 8, Mr & Mrs Lovebear; 9, B. & F. Hunt (Coventry); 10, Mr T. lying; 11, Mr T. Allen; 12, B. & F.

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Hire; 3, Mr & Mrs Bull, ex Louche; 4, Mr R. S. Elliot; 5, Mr H. Bainbridge (AAJAS); 6, Mr D. White, ex Liverpool; 7, Mr & Mrs Bull; 8, Mr & Mrs Cole (Chesham); 9, Mr R. Shapcott; Liverpool breeds: 1, Mr D. White; 2, Mr T. Allen; 3, Mr J. Farrow; 4, Mr T. Wood; 5, Mr J. Hall; 6, K. & H. Bales; 7, B. & F. Hunt; Single tail goldfish: 1, Mr F. E. Watts (Coveyry); 2 & 3, Mr R. Shapcott; Twin tail goldfish: 1 & 2, Mr N. Giles (Lakeney); 3, Mr J. S. Salisbury, ex Colchester pond or river fish: 1, Mr C. Pratt; 2, Mr P. Watts (Coveyry); 3, Mr F. E. Watts (Coveyry).

SOME 45 members and visitors attended the June meeting of the LONDON & SOUTH-EAST GROUP of the BRITISH MARINE AQUARISTS ASSOCIATION at Regent's Park. Guest speakers included Mr Graham Cox (the Association's president) and Mr John Vickery (national secretary). Two films were screened, one of them being the award-winning film from British Rail 'Between the Tides'. A behind-the-scenes visit to the London Zoo Aquarium arranged for September has been well subscribed to, as were purchases of the new 22-page illustrated booklet 'Tropical Marine Aquaria—An Introduction' written by the Group and published by the Association (enquiries to Mr Peter J. Ireland, 5 Sinclair Road, Waltham Forest, London, E4).

A public relations stand was set up by the Group at the Basingstoke & DAS Open Show and included a furnished tropical marine aquarium and native marine tank. The native marines included many different species of fish and invertebrates supplied by the Group's members and by Mr Lewis Doubleday, secretary of the SOUTH WEST GROUP, who was attending the Show to judge the marine entries. It is hoped that a similar display will be mounted at the Newbury & DAS and the Salisbury AS shows.

THE BASINGSTOKE & DAS Open Show, although its 935 entries did not break its own record, was acclaimed as the best Open Show the Society has staged; and this was due in no small way to the work put in by members who had joined since last year. Their efforts and successes in Open Shows this year are felt to be one of the Society's greatest strengths and a real cause for pride. Entries came from as far away as Cardiff, Cheltenham, Eritch and South Shields and were judged by Mr B. Baker (FBAS), Mr P. Bayntun (FGBS/FBAS), Mr C. A. T. Brown (FBAS), Mr M. Carter (FBAS), Mr L. Doubleday (BMAA/FBAS), Mr R. Eason (GSGB/FBAS), Mr C. Harding (CNAA/FBAS), Mr D. Hancock (FBAS), Mr A. Ibbotson (CNAA/FBAS), Mr J. Jeffery (FBAS), Mr E. Nicoll (FBAS) and Mr F. Tomkins (FBAS).

Mr Frank Tomkins, chairman of the FBAS, presented the prizes.

Ag: 1, Mr L. Lewis (Basingstoke); 2, Mr D. Parnan (BMAA); 3, Mr R. Basson (Basingstoke); 4, 5, 6, 7, 8, 9, Mr R. Smith (Basingstoke); 10, Mr A. Biss (Dor); 11, Mr B. Basson; 12, Mr S. Mason (Basingstoke); 13, Mr A. Blake; 14, Mr T. Taylor (Dor); 15, Mr M. Strang (Dor); 16, Mr D. Reddy; 17, Mr L. Brazier (Salisbury); 18, Mr T. Taylor; 19, Mr R. Goodson (Basingstoke); 20, Mr M. Strang; 21, Mr I. Strang (Basingstoke); 22, Mr T. Willis (Portsmouth); 23, Mr L. Brazier; 24, Mr G. Dixon (Newbury); 25, Mr R. Basson; 26, Mr F. White; 27, Mr I. Inrod (Salisbury); 28, Mr R. Groves (Mid-Sussex); 29, Mr D. Haines (Gosport); 30, Mr K. Ross (Gosport); 31, Mr J. Batts (Ealing); 32 & 33, Master Tony King (Basingstoke); 34, Mr A. Tracy (Gosport); 35, Mr A. Taylor (Salisbury); 36, Mr J. Taylor; 37, Mr R. Fran (Hounslow); 38, Mr K. Holmes (Havant); 39, Mrs C. Stanford (Basingstoke); 40, Mrs S. Parrish (Hounslow); 41, Mrs J. Twiss (Walthamstow); 42, Mr A. Blake; 43, Mr M. Cott (Gosport); 44, Mr A. Hamsworth (Dor); 45, Mr J. Jackson (Dor); 46, Mr A. Blake; 47, Mr A. Curragh (S. Shields); 48, Mr P. Hushcock (Reading); 49, 50, Mr R. Jones (Dor); 51, Mr D. Lambson (Basingstoke); 52, Mr B. West (Basingstoke); 53, Mr K. Selles (Ealing); 54, Mr A. Blake; 55, Mr A. Hamsworth; 56, Mr A. Blake; 57, Mr D. Reddy; 58, Master P. Watt (Havant); 59, Mr K. Lewis; 60, Master J. Wood (Walthamstow); 61, Mr E. Leslie (S. Weymouth); 62, Mrs Lland (Newbury); 63, Mr P. Newbury (Southampton); 64, Mr H. Pratt (Hounslow); 65, joint Mr D. Hilly; Mr D. Haines (Havant); 66, Mr P. Murray (Reading); 67, Mr R. Goodson (Basingstoke); 68, Mrs P. Lambson (Basingstoke); 69, Mr T. Woolley (Hartley).

G: 1, Mr A. Taylor; 2, Mr K. Lewis; 3, Mr P. Greenwood (Basingstoke); 4, Mr C. & Mrs Murphy (Gosport); 5, Mr C. Boots; 6, 7, 8, Mr I. Pierce (S. Weymouth); 9, Mr B. Basson; 10, Mr M. Chapman (Dor); 11, Mr T. Taylor; 12, Mr G. Smith (Walthamstow); 13, Mr G. Mason; 14, Mr T. King; 15, Mr J. Wilson; 16, Mr A. Luby (Mid-Herts); 17, Master T. King (Basingstoke); 18, Mr E. Farnham (Salisbury); 19, Mr R. Basson; 20, Mr L. Brazier; 21, Mr I. Carter (Gosport); 22, Mr J. D. Wilson; 23, Mr C. Toms (Cardiff); 24, Mr A. Heath (Lewisham); 25, Mr F. White; 26, Mr G. Dixon (Newbury); 27, Mr T. Adams; 28, Mr R. Newman (Salisbury); 29, Mr L. Little (Bracknell); 30, Mr T. King (Eritch).

Ud: 1, Mr R. Rich; 2, Mrs Pinder; 3, Mr R. Adams (Salisbury); 4, Mr L. Mansour (New Forest); 5, Mr E. Bismard (Portsmouth); 6, Mr R. Oslow (Basingstoke); 7, Mr J. Wilson; 8, Mr R. Adams (Salisbury); 9, Mr D. Lewis (GSGB); 10, Mr R. Rich; 11, Mr R. Davis (Bath); 12, Mr R. Goodson (Basingstoke); 13, Mr R. Basson; 14, Mr E. Bismard; 15, Mr J. & Mrs A. Hamsworth; 16, Mr T. Taylor; 17, Mr D. Parnan (BMAA); 18, J. & B. Burtles (Mid-Sussex); 19, P. Ronald (Dor); 20, Mr R. Basson; 21, Mr A. Chandler (Walthamstow); 22, Mr A. Luby (Mid-Herts); Novelty Class: 1, Mrs C. Stanford (Basingstoke); 2, Mr S. Freemantle (Gosport); 3, Mr & Mrs Murphy.

Best exhibit entered by a lady was *Ctenopoma binguleyi* owned by Mrs S. Parrish (Hounslow). Rochampton AS was the highest pointed society and the best fish in show was the *Tilapia mariae* owned by John Batts of Ealing AS.

In Brief . . .

... AT their June meeting DORCHESTER & DAS heard a talk on 'Classes of Fish' by Mr A. Worth, followed by a talk on 'Preparation of Fish for Showing' by Mr M. Cleal. Both classes in the month's table show were won by Mr R. Christopher with an angel fish and a goldfish.

... A LARGE gathering of NEW FOREST AS members at the Community Centre, Seprington, Hants, discussed ways to increase Society membership and to generate members' interest in showing more fish at local Open Shows. Mr R. Ross won the a.v. guppy class at the table show, and Mr R. Travers the a.v. shubunkin.

... MR C. Shipman (Grantham & DAS) gave an interesting demonstration on the construction of all-glass tanks to GAINSBOROUGH AS and most members admitted that they had learned a lot of new tricks to deal with this task. Winners of the monthly table show were: Large characins, Mr & Mrs W. D. Gilding; small characins, Mr R. Varney; minnows and danios, Mr & Mrs R. Harris. Master G. Gilding won all three classes in the junior section.

... MR D. Soper (Mid-Sussex AS) gave an interesting talk on breeding some of the more difficult fishes to members of BRIGHTON & SOUTHERN AS and set up a breeding tank for the junior members. Mr V. Aldis won the table show classes for both danios and minnows and barbs (judge, Mr C. West, Mid-Sussex AS).

... THE regular monthly meeting of NEWBURY & DAS was enlivened by an amusing but nonetheless informative talk by Mr Dodkins of Brentwood. His advice on how to keep marauding gangs of cats away from fish ponds largely consisted of stockpiling a liberal supply of half bricks, and his comments on his neighbours' efforts to find out what went on in his fishhouse had his audience 'in stitches'.

... 'A superb evening' was the verdict on the interesting and informative quiz presented by Mr Bernard Pye to members of SUFFOLK A & PA.

... SOUTHEND, LEIGH & DAS were the winners, with 16 points, of the second leg of the inter-club competition between N. Kent, Southend, Thurrock and East London societies. Progressive totals (two legs

to go) are: Thurrock (42); Southend (50); N. Kent (17); East London (11). An excellent talk by the very capable Hendon Group completed an enjoyable evening.

... **PLACINGS** in the **FGA BIRMINGHAM SECTION** Points Cup trophy competition 1972/4 after three shows are: Mr & Mrs D. Phillimore (141); Mr K. Lee (81); Mr G. Steadman (61); Mr & Mrs Burnell (50); Mr A. Charlton (49); Mr W. Bishop (45); Mr J. Bakith (34); Mr M. Delingpole (28); Mr H. Baldwin (25); Mr M. Steadman (23). The Section have accepted the FGA Central Committee's request that they should present the 1974 FGA World International.

... **SLOUGH & DAS** have enjoyed a talk by Mr F. Tomkins on general fishkeeping matters. At the table show, Robert Miles made a good start towards retaining the Honey trophy when he achieved 1st, 2nd and 3rd places in the advanced class. In the novice class Mr Williams came first with a pair of Australian rainbows and in the livebearer class Brian Withers came first with a swordtail.

... **AT SITTINGBOURNE & DAS** and home table show in the KAAS interclub competition the challenge was met by Tonbridge AS for classes E and J. Results were: E: 1, Mr B. Simmonds; 2, Mr B. Newman; 3, Mr A. Sharp. J: 3, Mr T. McDonald.

... **PRIVATEERS AS (SHIPLEY)** have been entertained with a splendid lecture by Mr J. Hemmingway of Buxley on the subject of breeding emperor tetras. His great knowledge was a revelation and most helpful.

... **MR M. Bishop of BISHOPS CLEEVE AS** had a successful evening at the Society's table show for *Corydoras* & aov cichlid classes winning 1st, 2nd and 4th places in the former and 1st, 3rd and 4th with cichlids.

... **LEAMINGTON & DAS** members have been enjoying a variety of activities. A talk on fish house construction by Mr P. Jinks and a slide quiz prepared by Mr D. Hawkins have been interspersed with a coach trip to a retail and wholesale fish establishment, and by an evening picnic to a local stream.

... 'FISH Farming in Israel' was the title of an interesting talk given by Mr D. Cross to members of **COVENTRY P & AS**. The Society are second in the positions to date of the MAL Eliminator Competition (1. Bedworth, 91 points; 2. Coventry, 66; 3. Spa Discussion, 63; 4. Loughborough, 47).

At from 1st September the new membership secretary (registrar) of the **BRITISH KILLIFISH ASSOCIATION** will be Mr P. K. Brown, Rushden, Elm Grove, Eccleston Park, Prescott, Lancs. L34 2RX. All enquiries regarding membership and renewal should be addressed to him (an s.a.c. would be appreciated). Mr W. Devison who held this office for a number of years is now resuming his previous position as secretary of the Association.

... **MEMBERS OF WEYMOUTH AS** were given a helpful demonstration on how to wire a tank with maximum safety by Mr B. Cornick of Dorchester in a talk on 'Safe Electrics'. Mr G. Fitzgerald won the table show a.o.s. characins class and Mrs P. Carter that for H.H. & C.

... **THE fifth annual EAST OF SCOTLAND CLUBS & SOCIETIES' Show** is to be held in Aberdeen on Sunday, 26th August. The venue is the Music Hall, Union Street—a central and easily accessible point. Entries (28 classes) accepted from 11.00 a.m. to 1.30 p.m. Classes include breeders' teams and Rift Valley cichlids (only members of East of Scotland Aquarium clubs or societies will be eligible to enter fish). Full details, schedules, entry forms, maps of Aberdeen, etc. are obtainable from Mr G. Ross, 1 Gairnshiel Place, Aberdeen (phone Aberdeen 493946) or through the secretary of any East of Scotland club or society.

... **FIRST event on DERBY REGENT AS** new calendar was at the Derby County Show where a successful exhibition of tropical fish was held. A highlight of the exhibi-

tion was a country cottage setting with plants and shrubs and a large pond filled with goldfish in front, with, as a final touch, a fountain in the centre.

... **TORBAY AS** members have been doing well at open shows this season, notably at the Ilfracombe, Yeovil and Weymouth shows. Mr J. Davis was judged to have the best coldwater fish at Ilfracombe. At the inter-club competition at Totnes, Torbay were second with 21½ points (1, Plymouth, 23; 3, Exeter, 9½).

... **MR B. Rowe** won the pictorial quiz on fishes presented by Mr M. Shadrack at the May meeting of **ILFORD & PS**. Table show class winners were: av labyrinth, Mr W. Rowe; av swordtail, Mr D. Seaman; av goldfish Mr H. Berger.

... **WHEN Mr T. Pound** spoke to **WREXHAM TFS** on aquarium accessories, particularly the home-made variety, some very useful items came to light. Another helpful talk, given by Mr E. Jones, gave advice on community tank breeding. Table show class winners are: botias, loaches and characin classes, Mr T. Pound; barbs, Mr R. Mathers; livebearers & aov catfish classes, Mrs S. D'Arcy; best junior, Master B. Roberts.

... **THE coldwater side** of the hobby was represented at the June table show of **BRISTOL AS** by veiltails and moors and the tropical side by catfish and loaches. A questions-and-answers session provided the entertainment, with questions ranging from first food for coldwater fry to the reluctance of males to chase during warm weather. Mr S. Tibble, an out-of-town member, started an interesting discussion with a query on successes with breeding and keeping daphnia.

Dates for Your Diary

4th-11th August. **PORTSMOUTH AS** Open Show. St Patricks Hall, Wimper Road, Southsea, Portsmouth. Setting up Saturday 4th August; judging, 5th; open to the public, Monday, 6th to Saturday, 11th. Schedules: Mr J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, Hants, PO3 6LD.

5th August. **TONBRIDGE & DAS** Open Show, Tonbridge School, Tonbridge, Kent. Schedules: Mr I. T. Mathieson, 31 Nortons Way, Five-Oak Green, Tonbridge, Kent.

5th August. **BLACKPOOL & FYLDE AS** Open Show. The Norbreck Castle Hotel, Norbreck, nr. Blackpool.

12th August. **NORTH STAFFS AS** Open Show. Cobridge Drill Hall, Waterloo Road, Cobridge, Stoke-on-Trent. FNAS Rules. Details: Mr K. Ankers, 4 Castle

Street, Chesterton, phone 739 564490, or Mr J. S. Booth, 515 Beverley Drive, Dentlice, Stoke-on-Trent, Staffs.

15th-18th August. **MIDLAND OPEN SHOW (MAPS)**. Bingley Hall, Broad Street, Birmingham. Details: Mr T. Grace, 46 Perrot Street, Winson Green, Birmingham, 18; phone 021-554 9064.

18th-19th August. **HARWICH & DAS** Open Show. The Queens Hotel, Dovercourt, High Street, Harwich. Details: Mr A. Green, 31 The Ridgeway, Dovercourt Essex, CO12 4AU.

19th August. **BEDWORTH A & PS** Open Show. Nicholas Chamberlain School, Bulkington Lane, Bedworth. Schedules: Mr J. Housden, 7 Tamar Road, Bulkington, Warks.

19th August. **STROUD & DAS** Open Show. Technical College, Stratford Road, Stroud. Schedules: Mrs D. Cole, Avigoon, The Hill, Randwick, Stroud, Glos. GL6 6JH (phone: Stroud 4504).

19th August. **HUDDESFIELD TFS** Open Show. Paddock Civic Youth Club, Beach Street, Paddock, Huddersfield.

20th August. **GREAT YARMOUTH & DAS** Tropical Fish Exhibition, North Drive, International High School, Gr. Yarmouth. Details: Mr P. G. Watson, 31 Common Road, Haverly, Gr Yarmouth, Norfolk.

20th August. **EAST OF SCOTLAND AQUARIST CLUBS & SOCIETIES** Annual Show. Music Hall, Union Street, Aberdeen. Entries accepted 11.00 a.m.-1.30 p.m. Schedule (List of Scotland club members 1973): Mr G. Ross, 1 Garroch Hill, Aberdeen (phone Aberdeen 493465).

20th August. **FLEETWOOD AS** 1st Open Show. Fleetwood Grammar School. Details: Mr N. West, 205 Moorberry Road, Fleetwood; phone FWD 3074.

21st September. **FRAS** Assembly. Conway Hall, Red Lion Square, London, WC1, 4.30 p.m.

2nd September. **WELLINGBOROUGH & DAS** Open Show. Quakerway Centre, Goldsmith Road, Wellingborough. Schedule: Mr D. Sc. Bishopp, 1A George Street, Wellingborough, Northants. phone Wellingboro' 3744.

2nd September. **THORNE AS** Open Show. Details: Mr B. Binks, 25 Mansfield Road, Mansfield, nr. Doncaster.

2nd September. **BETNAL GREEN AS** Open Show. Bethnal Green Institute, 229 Bethnal Green Road, London, E.2. FIAS Supreme Championship Trophy Class C (large chorizonta). Schedule: Mrs Sybil Hazler, 112 Ashburton Avenue, Seven Kings, Ilford, Essex IG2 4E. Phone: 01-550 3439.

2nd September. **LUCAS AQUARIUM & POOL SOCIETY** Open Show. Spring Road, Birmingham. Schedule: Mr R. Thomas, 11 Alton Road, Solihull, Warks.

3th September. Continued **BRACKNELL AS, DDCOT AS & READING & DAS** Open Show. White Knight, Slough Road, Reading. Details: Mr John Harter, 4 Richens Close, Woodley, Berks. (phone) Reading 666977.

4th September. **BOYLAKE AS** Open Show. The YMCA, Boylake. Details: Mr E. Rowlands, 3 Haig Avenue, Morston, Wirral, Cheshire.

4th September. **HARLOW AS** Open Show. Moor House, Harlow. Schedule: Mr S. Jordan, 48 Whitewash, Harlow, Essex.

4th September. **NEWBURY & DAS** Open Show. Plaza, Market Place, Newbury, Berks. Schedule: Mr G. Foster, c/o 28 Jubilee Road, Newbury, Berks.

4th September. **NUNEATON AS** Open Show.

11th September. **GAINSBOROUGH & DAS 'Mira'** Open Show. Blues Club, Gainsborough. Schedule: Mr W. D. Gilding, 18 Rutland Road, Woodbeck, Notts.

14th-15th September. **BRISTOL AQUARISTS SOCIETY** Open Show. Details: Mr E. N. Bowden, 13 Bromleigh Walk, Knowle, Bristol, BS4 2HL.

AMENDED show date for STONE AS. Their Open Show will be held on 23rd September, not 15th September as stated earlier. Schedule from Mr K. W. Evans, 42 Friars Avenue, Walton, Stone.

15th September. **MID-HERTS AS** Open Show. Berklays Annexe, London Road, St Albans. Schedule: Mr A. Lusk, 214 Riverside Road, St Albans.

15th September. **WESTON-SUPER-MARE & D TFC** Open Show. St John's Hall, Oxford Street, Weston-super-Mare. Details: Mr J. Clark, St Jude, North Street, Cheddar.

15th September. **BOUNSLAW & DAS** Open Show. The Youth Centre, Cecil Road, Bouslow, Middlesbrough. Schedule: Mr H. Parr, 42 Woodlawn Drive, Fellingham, Middlesbrough (phone) 01-984 0243.

15th September. **WEST CUMBERLAND AC** 1st Open Show. Civic Hall, Whitehaven, Cumberland. Details: Mr J. Parker, 1 Boothby Avenue, Greigill, Egremont, Cumberland.

15th September. **HASTINGS & ST LEONARDS AS** 1st Open Show. Concordia Hall, Church Road, St Leonards. Schedule: Mr T. Adams, 17 Lower South Road, St Leonards-on-Sea, TN37 6RH.

15th September. **BUXTON & DAS** Open Show. The Pavilion Gardens, Buxton. Schedule: Mr A. Holton, 8 Millard Terrace, New Mills, via Stockport, Cheshire.

22nd September. **RHONDDA AS** 1st Open Show. Canal Hall, Tonypandy, Rhondda. Booking 9.00-12.30. Schedule: Mr M. Williams, 122 Tŷon, Yrbyronog, Trebanog, Rhondda, Glam. Excellent catering.

22nd September. **GSGB** 25th Anniversary Show.

23rd September. **TOBBAY AS** Open Show. Torquay Town Hall. Schedule: Mr J. R. Davis, 8 Brewood Close, St Marychurch, Torquay, Devon.

23rd September. New date. **HUCKNALL & BULWELL AS** Open Show. Bulwell Youth Club, Coventry Road, Bulwell, Nottingham. Booking, 11.00-2.00 p.m. Schedule: Mr J. Sutcliffe, 273 Wicklow Court, Basford, Nottingham.

23rd September. New date. **STONE AS** Open Show. Walton Community Centre, Walton, Stone. Details: Mr K. W. Evans, 42 Friars Avenue, Walton, Stone.

23rd September. **CASTLEFORD AS** 1st Open Show. Postoffice Road Boys' Modern School, Postoffice Road, Castleford. Enquiries: Mrs J. E. Asquith, 12 Lower Griford Street, Castleford, Yorks WF10 4AE.

HUCKNALL & BULWELL AS will now be holding their Annual Open Show on 23rd September and not 20th September as advertised owing to circumstances beyond their control. The Show will be held at Bulwell Youth Club, Coventry Road, Bulwell, Nottingham. Booking is from 22 noon to 2.00 p.m. Revised schedule can be obtained from Mr J. Sutcliffe, Show Secretary, 273 Wicklow Court, Basford, Nottingham.

20th September. **CHESTERFIELD & DAS** Open Show. City Cross Social Centre, Chamberfield Road, City Cross, 10 Chesterfield, Derby. Entry 20.00. Mr. follow signs 4 miles to Show. Special venue on A61. Booking 12 noon-2.15 p.m. Schedule: Mr D. Stone, 217 North Wingfield Road, Grassington, Chesterfield, Derby. S24 2ER (phone) Number 2773.

20th September. **NORTHAMPTON & DAS** Open Show. The Drill Hall, Northampton. Schedule: Mr G. Allen, 10 Chilton Avenue, Northampton.

20th September. **GOODYERS-END AS** 1st Open Show. The St. John Ambulance Hall, Holbrook, Coventry.

20th September. **IRISH TROPICAL FISH SOCIETY** 2nd Open Show. The Marysion House, Dromon St., Dublin 2. Schedule: Mr J. P. Nainath, Kilmahin, Rathfild, Co. Dublin, Ireland.

5th October. **EAST LONDON A & PA** Open Breeders Show. Schedule: Mr F. Vicker, 11 Irons Way, Callar Road, Romford, Essex.

7th October. **HENCKLEY & DAS** Open Show. Heathfield High School, Belle Vue Road, East Shilton, Leamster. Details: Mr T. Bauders, 29 Brewhing Drive, Leics.

11th-14th October. **FNAS BRITISH AQUARISTS FESTIVAL** at Belle Vue Gardens, Manchester.

22nd October. **SHERWOOD AS** Open Show. Thornesby Miners Welfare Hall, Edwinstown, nr. Ollerton, Mansfield, Notts. Schedule: Mr J. Igo, 25 Marple Avenue, Mansfield-Woodhouse, Notts, NG19 6EY (phone) Mansfield 32443.

28th October. **DONCASTER & DAS** Open Show. Broadmarsh Miners Welfare Hall, Welfare Road, Woodlands, nr. Doncaster.

Continued on page 204

London's Sixth Annual Exhibition of Fishkeeping The AQUARIUM SHOW '73

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3rd November, GSGB Quarterly Meeting, Conway Hall, Red Lion Square, Holborn, London, WC1, 8.20 p.m.

6th November, MIXENDEN TFS Open Show, Venue and details later.

18th November, **HARTLEPOOL AS** Open Show, Longmar Hall, Seaton Cross, Details: Mr J. Watson, 48 Ryedon Road, Hartlepool, Co. Durham, TS25 2HW.

11th November, **WALTHAMSTOW & DAS** Open Show. Details to be announced.

17th November, 1973 **HENDON CONGRESS** (provisional date).

17th November, **KINGSTON & DAS SOUTH PARK AQUATIC STUDY SOCIETY** combined Open Show, T.A. Centre, Surbiton Road, Kingston, Surrey.

Schedule: Mr D. J. Mackay, c/o 11 Mount Road, New Malden, Surrey (phone: 449 01-572 0521 night, 01-944 9013).

17th November, **GSGB 15th Anniversary Dinner Dance**, Details: Mr A. Lawman, 16 Gordon Road, Enfield, Middlesex.

1st December, **FBAS Assembly**, Conway Hall, Red Lion Square London WC1, 8.30 p.m.

and December, **HORSFORTH AS 4th** Open Show, New Civic Hall, Staningley, Pudsey.

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GOLDFISH SOCIETY OF GREAT BRITAIN STANDARDS BOOK. Revised (1972) 40-page publication. Standards for 13 approved fancy goldfish varieties, illustrated in line. 40p post paid. PF Publications, 554 Garratt Lane, London, SW17 0NY.

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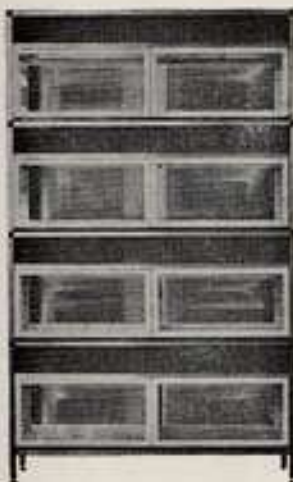
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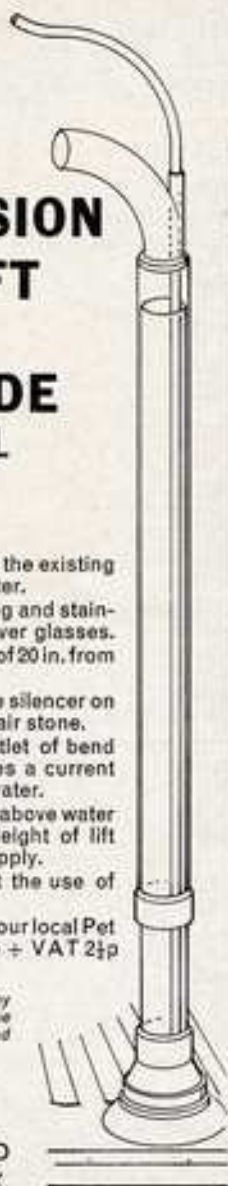
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