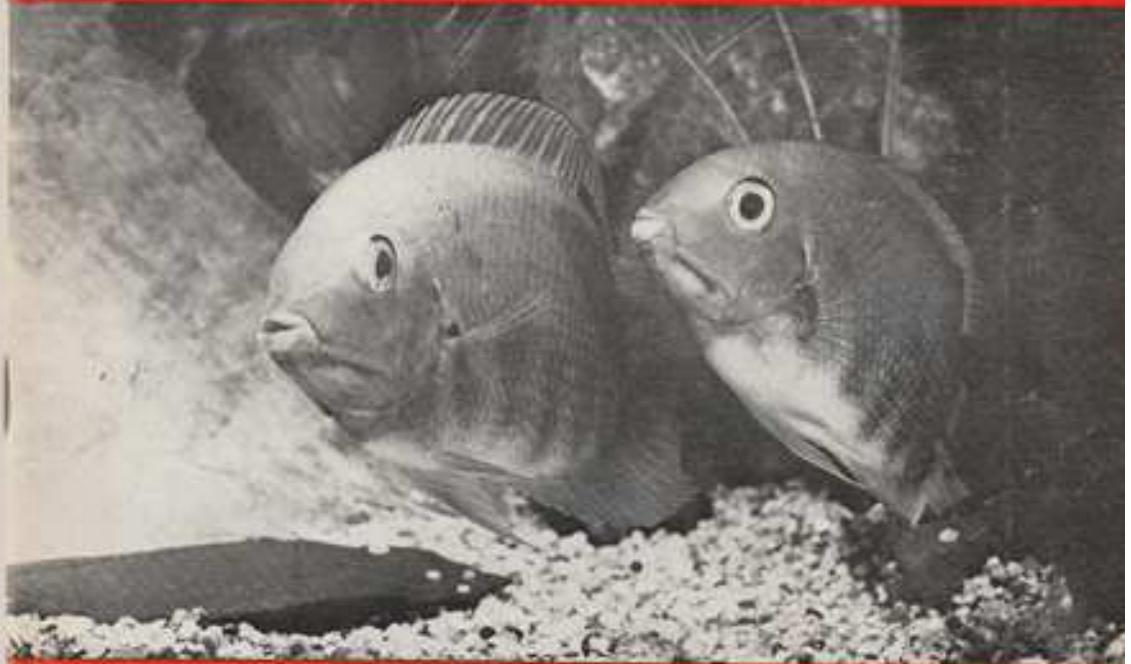


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Comments and Quotes

**Look to
the Future**

ON the distant horizon—a small cloud that many will be watching anxiously for the future of the trade in aquarium fish here. We have heard that the occurrence of a fish disease with rather drastic consequences, spring viraemia of carp (SVC), has been newly recognised as prevalent in goldfish and koi imports. The implication of this for our indigenous fishes and particularly for fish farms is such that it is likely that legislation to control importation of fishes could be introduced. If so, this could well make difficulties, to put it mildly, for tropical fish suppliers.

Of course, it is not only for aquaria and garden ponds that fish are imported—angling interests are known to have brought in carp for stocking fishing waters. Nevertheless, the lesson from other countries that do not allow live fishes to be imported is that, when applied, such a ban is usually of the 'blanket' type—affecting all species for whatever the purpose.

SVC is one of a growing list of fish diseases known to be caused by viruses. There is as yet no magic bullet for these and so control of infected fish rather than treatment is all that can be aimed at. At a time when fish farming in Britain is beginning to attract the attention of big companies (British Oxygen is reported to be developing a £60,000 trout-rearing unit designed to produce 120 tons of trout a year) it seems certain that every means of eliminating the risks to such ventures will be looked at.

As we suggested in our Comment in the March issue of PFM, home-bred fishes could well become a most important source of supply for the aquarium trade in the future and if really strict controls were to be

introduced, this could become the only source of supply. Not since World War II has it been so important for aquarists to perfect their breeding techniques for as many species as possible.

**Tough
Tilapia**

AMONG the lakes of the Great Rift Valley of Africa are some with exceedingly alkaline waters (around pH 10). The presence of carbonates and bicarbonates dissolved in the water is responsible for the alkalinity and their concentration is such as to give the lake waters a high salinity. Add to this the fact that at times the water temperatures in some regions of the lakes can be as high as 104-111°F (40-44°C) and most fishkeepers would begin to rate the chances of finding living fish in the lakes as pretty slim. And yet the Lake Magadi tilapia (*Tilapia grahami*) occurs in just such conditions in Kenya. Just how tolerant this species is of extremes of water reaction, salinity and temperature has been looked into by scientists from Denmark and Kenya, who have reported their findings in NATURE.

No other fish has been shown to tolerate water reaction as alkaline as that lived in by *Tilapia grahami*; in fact laboratory tests revealed that this fish exhibited no ill-effects after 24 hours at various pH values in the range pH 5.0 to 11.0. With such resilience the fact that in the hot Lake Magadi waters the fish also have to cope with rather low concentrations of dissolved oxygen is perhaps something of a minor surprise, but the scientists have noted that the largest tilapia are found in the shallower pools rather than in the less well oxygenated lagoon and hot springs of Lake Magadi.



Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London SW17 0NY

Well Worth Joining

THANK you very much for telling me about joining the Isle of Wight Aquarists Society. I have already attended several of their meetings and I am an enrolled member and can now enter their table shows. I have entered my fish at nearly every meeting and have won second in the fighters and labyrinths class, third in the guppy class and fourth in sexed pairs. I had already entered my gouramis in an open fish show and won a third and best fish in show award (Special) but I didn't have a clue about showing them. I just put them in to see what the judge would say and I didn't expect to win anything. But now I have joined the Society I have learnt a great deal about breeding fish, raising fry, diseases, marine tropicals etc. I couldn't even tell which fin was which, but now I can, thanks to you.

Ventnor, Isle of Wight

MISS E. WOODMORE

A Visit To Japan

DURING the early part of spring this year I was able to visit Japan. This was a preliminary visit to personally check facilities and arrangements for the forthcoming BKKS trip to Japan in April, 1975. I met a great many members of the Japanese Koi Society and was very privileged to visit their

homes and see their ponds and koi. I was particularly impressed by their filtration methods and of course the superb specimens of koi. I was able to visit Tokyo, Kyoto, Himeji, Maizuru, Kanazawa, Nagaoka, Ojiya and of course Yamakoshi Village. This will be the basic itinerary for the group's visit next year, including a visit to Bangkok in Thailand for a few days on the outward journey.

ROLAND SEAL

*Secretary, Northern Section,
British Koi-Keepers' Society*

Readers interested in the proposed visit to Japan should write to the BKKS secretary Mrs E. A. Allen, 1 Anthony Close, Peterborough PE1 3XU, Northants.

Any Unwanted Books?

WE have just formed our own club library. If any readers have any books relevant to fishkeeping that they no longer want, I would be very grateful if they could send them to me at 16 Morrell Crescent, Littlemore, Oxford. Any books donated would be gratefully received; postage will be returned.

G. R. HALF

Secretary, Abingdon AS

Meetings and Changes of Officers

AIREBOROUGH & DAS. Meetings: 1st Thursday of month, 7.45 p.m. Greenacre Hall, Bawdon, nr Leeds. Visitors welcome.

BANINGSTOKE & DAS. President, Mr A. Baker; vice-president, Mr A. Marshall; chairman, Mr G. Clewer; vice-chairman, Mr G. Dixon; secretary, Mr B. Binson (72 Derwent Road, Kempshott, Basingstoke); treasurer, Mr M. Strang; show manager, Mr H. Onslow; show secretary, Mr R. Rich (93 Pinkerton Road, Basingstoke); programme secretary, Mr A. G. Harnsworth; project officer, Mr A. Cripps; raffles secretary, Mr W. Turner.

BRADFORD & DAS. President, Mr J. E. Cawthra; secretary, Mr A. Firth (17 Burras Road, Bradford 4; phone Bradford 24017); treasurer, Mr G. M. Creasey; show secretary, Mr E. L. Brown (8 Garden Field, Wyke, Bradford; phone Bradford 871577); P.R.O., Mr A. Herberts. Meetings: 1st and 3rd Wednesday of month, Lecture Room, Q.S.S. Aquarists, Wakefield Road, Bradford, 7.30 p.m.

BRITISH MARINE AQUARISTS ASSOCIATION, CHESHIRE & NORTH WALES GROUP. Meetings: 1st Monday of month, R.A.O.B. Social Club, City Road, Chester.

BUCKLAND & MILLER COMMUNITY ASSOCIATION AQUARIST SECTION. New Society. Secretary, Mr R. Hambley, 7 Drake Road, Newton Abbot, Devon.

CARDIFF AK. Chairman, Mr D. Warrmann; secretary, Mr D. Seaton (63 Bishop's Road, Whitechurch, Cardiff); treasurer, Mr P. Rosich; show secretary, Mr C. Turner (146 Arvan Street, Roath, Cardiff). Meetings: 1st Thursday in month, Tredegar Hotel, Clifton Street, Cardiff.

HAMPSTEAD & DAS. Meetings: 2nd & 4th Mondays of month, 8.00 p.m. Blackheath Hall, The Priory, Southampton Road, London, NW3. New members welcome.

HASTINGS & ST LEONARD AS. New show manager, Mr M. Penfold, 44 St Mary Road, Hastings, Sussex.

HUDDERSFIELD TROPICAL FISH SOCIETY. New issue, Invald Car Club,

Mill Street, Croxall Moor, Huddersfield. Meetings: every other Tuesday.

MIDLAND ASSOCIATION OF AQUARISTS SOCIETIES. Chairman, Mr T. Sloss (NWAS); secretary, Mr K. Bass (Hinkley & DAS); treasurer & services secretary, Mr R. Todd (Redworth A & PS); bulletin editor, Mr R. Marnden (SASS); judge convenor, Mr G. Parker (SASS); speakers convenor, Mr M. Harvey (MTA). Convenor: Mr G. Noble (Cheshamley AS); Mr G. Roberts (Lucas AS); Mrs D. Roberts (Lucas AS); Mr M. Carter (Redworth A & PS); Mr M. Bass (Haden AS); Mr M. Edwards (Lantrick AS).

NEWBURY & DAS. Meetings: New issue: The Liberal Hall, Bartholomew Street, Newbury, Berks, third Tuesday of month.

PORTSMOUTH AS. Chairman, Mr J. Sillwell; assistant chairman, Mr J. Lambell; secretary, Mrs L. Howard, 51 Kingscote Road, Cowplain, Waterlooville, PO8 8DD; assistant, Miss A. Crocker; treasurer, Mrs J. Sillwell; show secretary, Mr J. Howard; assistant, Mr W. Ryder; publicity, Mrs E. Scratley; honl. Mr R. Streetley, Manning: 1st & 3rd Wednesday of month, Portsmouth Community Centre.

SOUTH LEEDS AS. New show secretary, Mr B. Kughley, 28 Rydall Street, Holbeck, Leeds 11; phone Leeds 25120.

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From Hobbyist to Farming the Glass Fish in Florida

By
A. DOUGLAS WERBECK

Photographs
by the author



Fish farm glass
fish (*Chanda ranga*)

THE way it all began might be easily guessed. We set up a display tank in our parlour. It didn't contain any guppies; I knew what that could begin and it was intended to be the only tank in our apartment.

I did make the 'mistake' of including a pair of black mollies, which rewarded us for our care with a brood. I had an old 5 gallon tank in the cellar and, even though my original plan was to keep to one tank, I thought it only decent to remove the fry and give them a bit of security. Well, the next morning, to our dismay, we found that the old 5 gallon tank was a 'leaker', in the 'slow-to-moderate' category. It was obvious that I would have to purchase a new tank. I returned home that evening with a 10 gallon tank. After all, it was only a couple of dollars more than a 'fiver' and it looked so much more roomy.

One year later, one room of our apartment had been taken over. Let that not lead you to believe that all of our fish were in that room. Tanks were scattered all over; every nook and cranny was fitted. First-time guests would enter the house and, upon climbing the stairs to our apartment, would enquire about the strange noise, all of that gurgling like something was badly leaking. The

rooms hummed with vibrator pumps buzzing their way across floors and crashing off shelves. Anyone searching the refrigerator for a cold drink might come upon very strange things that wiggled, waved and popped about in containers of water.

My special interest was egglayers. I was deeply engrossed in breeding this and that, cooking strange-smelling mixtures on the stove that even our dog wasn't interested in, mopping up water from the floors and removing things from the sink so my wife could do the dishes. This went on every evening after work and all weekend long. We didn't go out anymore and our friends began to realise that when they visited we talked about fish.

One day, out of the blue, or possibly it was the day after we refused another dinner invitation, my wife asked me what I wanted to 'do'. Before I could ask her what she meant she said that if I wanted to 'do' fish I should, and leave my position as a photography studio manager in New York. To make a long story short, I did just that. Dr Herbert Axelrod was most helpful in offering guidance into the area of professional breeding. He advised us that if we wanted to do it right, we would have to relocate to Florida where all the fish business is happening. Through his assistance we were also

able to locate a small fish farm. After a short while we were living 1,000 miles from New York in the sub-tropical climate of Florida. It was a big step.

The more I discover about the 20 years-old 'industry' down here the more I am amazed. The fact that our farm is located midway up the peninsula and on the west coast is no coincidence. There are 300-400 fish farms in this area, which lends itself to fish farming for many reasons. While there are several southern areas in this large country with a warm climate, few are as 'tropical' as Florida. Also, the soil in this particular area is of a fine sandy nature which can hold water, and the natural water level is quite high, only about 3 or 4 ft. below the surface. This makes it most advantageous to dig large, earth pools which need no liners to contain the water, since they fill naturally.

The average size of a pool is 20 ft. by 90 ft. with a depth of about 10 ft. All pools are equipped with underground plumbing connected to a deep well whose water temperature stays a constant 75° F (24° C) all year round. During the colder weather the pumps are turned on and warm water flows into the pools. If the flow is adequate the fish will congregate around the incoming water and survive through the cold spells. On the average the temperature falls below freezing in this area two to four times per year. This 'open' pool procedure can be used only with hardier fishes: livebearers and some egglayers such as danios. All other types of fishes must be kept in 'covered' pools or indoors through the winter, which lasts about 3½ months.

A covered pool looks similar to a house before the walls are installed. A wooden framework is covered with large sheets of translucent plastic cloth stapled in place. The covering is torn off in the spring and new plastic is applied the following autumn. The covering provides a greenhouse effect and the inside temperature can be kept near ideal on all but the windiest, cold days.

The water for the most part is very alkaline, about pH 8.2, and quite hard, about 300 p.p.m. (DH 17). This type of water naturally lends itself to certain types of fishes, but this by no means disqualifies any other type of fish from being bred. The more I learn of commercial breeding methods in Florida, the more I realise that all of the hard and fast rules stipulated in many books for breeding fishes can either be 'bent' or washed out completely.

A vast variety of fishes are commercially bred in Florida, livebearers and hundreds of different egglayers. Just as I start to think that I have found a fish that can't be commercially bred in Florida, I find out one of my neighbours is having tremendous success with breeding it. The only common fish I haven't run across yet are cardinals

and neons. Apparently the East Asian competition is still too strong to make all of the special breeding arrangements needed financially profitable.

Dr Axelrod once wrote that fish farming is not for the faint at heart. That is true—as a matter of fact, probably an understatement. A number of unfriendly entities are constantly trying to put you out of business, such as giant birds that stroll about the edge of a pool looking for you-know-what, large turtles, a variety of poisonous and non-poisonous water snakes, swamp otters, freshwater crayfish (a very prolific bunch), diving insects and an enormous selection of obnoxious aquatic insect larvae. There is very little problem with disease in the pool fish. I've been told that this is because the fish are in a natural earth and water habitat so their natural resistance is very high. I won't relate how we deal with the larger predators, in case the game warden is listening, but the insect and insect larvae types are dispatched with insecticides put in the pool water. An insecticide known as Baytex is most commonly used, which kills a large variety, but not all, of insect larvae and crayfish. The pool water temperature dictates the dosage; it must be used carefully or it can be lethal to the fish.

My farm was a speciality farm. Originally it raised only angels and glassfish, *Chanda ranga*. From the limited information I have been able to obtain, *Chanda ranga* differs from the other popular species of glassfish, *Chanda lala*, by three easily distinguished characteristics. First, my species, *Chanda ranga*, are really not too transparent, but gold in colour and during certain periods have red fins with the male's anal fin outlined in bright blue. They are really quite pretty. *Chanda lala* really are like glass, transparent and colourless. Secondly, *Chanda ranga* will eat only live foods, whereas *Chanda lala* will eat a variety of dry foods. Thirdly, sex in *Chanda ranga* can be differentiated only by the blue edge on the anal fin of the male as mentioned above, whereas in *Chanda lala* the males are longer and slimmer than the females.

My angel fish are bred in tanks, but the glassfish breed naturally in the pools. As a point of interest, it might be mentioned that by my informal observation, a fish grows about four times as fast in an earth pool as it does in a tank. I'm sure it is not simply a matter of more room because I have tried several simple experiments with large tanks, yet the ones in the pools continue to grow much faster.

My farm is the only one in the immediate area, to the best of my knowledge, that raises a quantity of glassfish. I'm told that the original breeding stock came from the lagoons of Marseilles, France in the late 1940s. That information came to me from the previous owner of this farm. Recently

I've heard that Marseilles has some very cold weather so some doubt has been cast on the original story. All glassfish that I have read about have been designated brackish, but mine are a strictly freshwater variety, and no salt is ever used. My pools, which are slightly larger and deeper than the average pool, will yield, per pool, 4,000 to 5,000 glassfish per year.

Chanda ranga are generally classified by books as 'difficult fish'. Most notorious of its idiosyncrasies is the previously mentioned fact that it eats only live food. Mine will taste most anything that drifts by but eject anything that isn't alive. Because of this dietary mandate my glassfish pools are not fed; instead they are conditioned with

they are not willing to chase down a meal the experiment was a failure.

All of the glassfish we remove from a pool have to be 'brought up', as it is called, with a large nylon fishing seine. The one we use is 6 ft. by 26 ft. Using a seine is considerably more difficult and time-consuming than trapping. The type of earth pool that is to be seined must be of a slightly different configuration than one for trapping. The ends of the pool must be sloped gradually at the edge of the water so the lead line of the seine can be gradually brought out, confining the fish. The pool to be seined must also be kept absolutely free of cat-tails and other aquatic plants that might snag the seine. This is no little task. The fact that

Ponds on the author's fish farm fill with water naturally. Their average size is 20ft. by 90ft. and about 10ft. deep and will each yield 4,000-5,000 glass fish per year.



various types of matter ranging from cotton-seed meal to cow manure. These items provide food-cycle sources for cyclops, which grow naturally right in the pool. Cyclops seems to be the favourite food of glassfish. I am still experimenting with various types of conditioners to produce the best supply of cyclops. I should mention that, although their favourite food is cyclops, glassfish will eat most all other live food. *Chanda ranga* will not chase food. They seem to feel that if a cyclops is good enough to present itself, it should be eaten.

Most fish farmers are able to trap their fish from pools in wire screen or clear lucite traps with (most popularly) cat food, of all things, as bait. My glassfish, however, couldn't care less about cat food and they have no inclination to go out of their way into a strange-looking device to have a meal. I have even tried putting a clear plastic bottle full of cyclops in a trap for bait, but I suppose because

glassfish have to be seined up and that the pools must be kept so 'clean' are probably the two biggest reasons why other farms do not raise any appreciable amounts of glassfish.

Perhaps someday someone will develop the long-discussed dry granular food with a live food flavour that will twitch and dart when put in the water. This would no doubt make keeping many fishes easier for everyone. Such a development would allow the large dignity of the little *Chanda ranga* to be enjoyed by many more aquarists.

A type of 'self-propelled' dry food may seem a bit far-fetched. Any mention of the subject to my friends brings a humouring smile. To me the idea doesn't seem any more far-fetched than if 30 years ago you told someone that you wanted to be able to watch a royal wedding in England, live, while sitting in your easy chair in Florida, U.S.A. Well, I've seen the wedding. TetraMin, what do you have to say?

Book Review

FBAS NATIONAL GOLDFISH STANDARDS (Technical Information Booklet No. 4). 20 pages. Federation of British Aquatic Societies, London. 1974. 20p.

THE FBAS Goldfish Standards were first produced by the Federation in 1947 and re-issued in a revised edition in 1954. This booklet is the latest publication and replaces both previous editions; it does, however, retain the five 20-pointing system with which most aquarists are familiar.

The newcomer to fish exhibiting will find that the comprehensive explanatory text is easily understood, giving guidance to the method of pointing and the essential features of the various varieties and scale types. Under the heading 'General Guidance and Information' there is a note of wisdom, for the final paragraph reads '... standards regardless of their quality or their acceptability will produce not one goldfish. The primary aim of all goldfish enthusiasts then is not the production of standards but of Goldfish'.

Page 7 provides a further useful aid to the newcomer to the showbench. Proportional diagrams are given for both single- and twin-tailed varieties of goldfish; these are in the form of representational outlines drawn upon squared co-ordinate lines.

Goldfish Society of Great Britain nomenclature has been used for the three scale groups, i.e. metallic, nacreous and matt. Familiar also is the term 'basic': nine of the varieties have been designated 'basic variety'—the comet, fantail and oranda being described as 'intermediate varieties'. The experienced exhibitor will notice also the great similarity of some of the depicted standards to those which were produced by the GSGB (what a great pity it is that these two organisations could not agree to produce a single true set of National Goldfish Standards). After the controversy that was aroused by the GSGB when they published their 'Bristol-type shubankin', the great majority of goldfish enthusiasts will be pleased to find in the new FBAS booklet that the shubankin standard, as drawn up by the Bristol Aquarist Society in 1952, is included.

Each standard variety is clearly drawn and most, but not all, are depicted fully scaled, with shading to give the impression of solidity. This method of

illustration gives a much clearer idea of the standard required than does a simple unshaded outline. It is unfortunate that this attention to detail was allowed to lapse on pages 17 and 18. The pompon carries a caudal that has a pointed upper lobe to the fin whilst the lower is rounded. To a lesser extent this also applies to the celestial. In all but three cases both lateral and dorsal views of the fish are shown.

The minute print I found very tedious to read; nevertheless, the text was clear in its intention, being written in such a way that the standard requirements for each variety were clearly understandable.

My criticism in no way detracts from the usefulness of these show standards for goldfish. The booklet is well worth the nominal cost and should find a place in the home of all exhibitors of goldfish.

FRANK ORME

WEST AFRICAN FRESHWATER FISH by M. Holden and W. Reed. 68 pages. Line illustrations and colour plates. Longman. 70p.

THIS book, by two specialists in West African fisheries, is written for amateurs who are interested in the African fauna and particularly in the identification of fishes. Representatives of the commonest genera occurring in the Niger and Benue rivers system are described and illustrated by clear line drawings or colour photographs. Notes on the features studied in the identification of fishes are explicitly given to guide any amateur ichthyologist, as also is information on catching the fishes for aquaria or for use as food. In a small book such as this one there must obviously be many omissions; of the barbs, for example, probably having nearly 300 representatives in Africa, only *Barbus occidentalis*, *B. punctatus* and *B. signatopigus* are discussed, but catfishes do rather better with 'just over half' of the 40 or so species from West African freshwaters being described. Of the little asides from the authors' practical experiences in West Africa the one to illustrate the aptness of the common name of the snakehead can be quoted: 'On one occasion one of the authors was hauling some gillnets and thought he had caught a large snakehead. Suddenly he realised that the snakehead was indeed a snake, a six-foot python. As he was alone in a small dinghy, it was fortunate that the python had drowned'. Unexpected snippets are also to be found, such as the fact that the African pike *Hepsetus odoe* lays its eggs in a bubble nest. A most useful and readable book, inexpensive and worthy of addition to the enthusiastic aquarist's library.

A.E.



Bunocephalus—A Natural Mimic

By W. A. TOMEY

Photographs by the author

SOME time ago some very remarkable fish that I had never seen before were offered to me. I had no clue as to what they were called or what their requirements might be but after a lot of thought I decided to buy them. From the construction of their bodies, their coloration and behaviour I could establish that I was dealing with dwellers of fairly fast-flowing waters, where they probably lived on a dark bottom substrate. After consulting the international literature, I found that the fish belonged to the genus *Bunocephalus*, which, so far as we know, live only in the northern parts of South America. The species I have is probably from Surinam, Guyana and Guiana.

They are peculiarly shaped fish, provided with a strong bony armour on the back, in contrast with the belly, which is very soft, though the typical square plates are still visible. The fish are very broad and flat, with large pectorals like delta wings, and a long tail. The fin rays end in a very small hook that plays a part in the propulsion of the creature over the bottom. The dorsal is positioned just above the pelvic fins and this double set of fins more or less forms a separating line between the broad and narrow parts of their body.

Their colour is mainly brown, though this can change substantially depending on a variety of factors. Whilst the front part of their body is usually a bright brown, the tail-end is dark brown. The body is also provided with rather irregular granular marks that make the fish look exactly

like a small twig with leaf attachment, that has fallen from a tree and has been lying on the bottom of the water for some time. A good example of mimicry! On closer examination, long rows of small warts are visible all over the body with the exception of the underside. These small warts can change in colour from white to brown and black.

Apart from the long barbels there are a couple of cavities (the nostrils) on the upper jaw, which may perform a function in smelling and tasting. Still another pair of very short barbels can be seen on the lower jaw. These are very sensitive and may serve to trace food as well. In fact, the sense of taste and smell and the ability to perceive vibrations are very well developed in these awkward-looking fish. Sometimes one can see a *Bunocephalus*, hanging between the water plants or lying on the tank bottom, become immediately aware of food offered (mosquito larvae, tubifex etc.) even though it cannot see it and it is at a distance of 4½ feet! The eyes are small and project just above the surface of the very flat head. The name of the fish, *Bunocephalus*, is probably derived from the small irregular warts on their body: *bunus* (Greek), hill or mound, *kephalo* (Greek), head, i.e. *Bunocephalus*, with a bumpy or hilly head!

These are evening or night animals and at first there was very little daytime activity from my new aquarium fish, but when dusk fell they came up to the front panel of the tank to look for food on the bottom. If *Bunocephalus* are kept in an



Head-on view of *Bunocephalus*. The photograph on page 15 gives a similar view of a specimen in a favoured position—resting on a leaf.

aquarium for a long time they get used to their surroundings and will become more active during the day, claiming their share of the food. At first, though, in order to make sure that they are fed satisfactorily, they must be offered food at twilight. When first imported there may be a little adaptation trouble, but they very soon develop into

really good eaters! They eagerly accept daphnia, mosquito larvae, tubifex and every kind of live food. They can eat so much that their flat belly becomes quite round.

Although *Bunocephalus* look so awkward, when danger approaches they can develop a surprising turn of speed. Possibly this may be the result of their taking in water through their broad mouth, which when forcefully closed expels the water through the tiny gill openings. This propulsion is further assisted by the very large pectorals and the long tail. Normally, however, they are rather slow moving and this great speed is only developed as a fright reaction, when they sometimes whirl down through the water like a small leaf on a twig falling from a tree.

Just like a number of other fishes of this family, they like well-oxygenated water but in an emergency they can switch to a peculiar intestine-breathing mechanism that enables them to survive in unfavourable circumstances. If they are suddenly taken out of the water, for instance by birds, a grunting noise can clearly be heard as a result of the air escaping from their body.

In the literature it is reported that *Bunocephalus amaurus* can hide under the gravel but I have not myself witnessed this yet. During the daytime they can be found in the most peculiar positions among the water plants, though most of the time they lie on the bottom. But because of their ability to camouflage themselves they are sometimes difficult to see, so if, for instance, you are using a planting stick in the tank be very careful that you don't damage them.

Because of their nocturnal habits, we know very little about these interesting fish since it is not easy to watch these dwellers in darkness. But they are worthy acquisitions for the real fish enthusiast.

Starting with FANCY GUPPYS

By F. CAMPBELL

PERHAPS the most paradoxical situation that can be encountered in the fishkeeping world is the willingness with which guppies produce young yet persistently refuse to produce young which look like the parents or each other. Their frustrating inconsistency has been the subject of scientific research for a century, and hobbyists have formed specialist groups the world over, but it is still not possible to produce and maintain a true-breeding strain of fancy guppies without

putting in a great deal of effort, consisting mainly of patience and vigilance.

Much progress has been made, of course, and the Federation of Guppy Breeders Societies and the Fancy Guppy Association, the two specialist groups active in the U.K., have reached mutual agreement on a set of standards based on finnage shape. There are at present 22 different shapes, 15 male and 7 female, and as these can be presented in an almost endless variety of colour patterns the

chances of coming up with a winning line are something akin to finding a fortune-winning line on the pools!

How then should the beginner, desirous of breeding fancy guppies, set about it? Theoretically it is simple. Obtain a good pair and in-breed, retaining the offspring with the desired traits and discarding those that are undesirable, introducing new blood from an unrelated similar strain to maintain 'hybrid vigour' when necessary. In putting this into practice, however, the guppy breeder can encounter an assortment of complications not usually experienced by breeders of other individual species. Some of these I will endeavour to outline.

Interest in fancy guppies is usually aroused by the particularly flamboyant males with broad and colourful caudal spread, which have probably been produced commercially in tropical pools. Having acquired one of these the aspiring breeder will need a suitable female and immediately strikes the first snag. Female guppies do not readily display the traits which they are carrying and, even if a suitable female is available, the results of an immediate mating with the selected male usually prove disappointing. There can be many reasons for this and the first to consider is that the female is already gravid as a result of a previous insemination, perhaps by an undesirable male. If so she can continue to produce a brood at intervals of approximately 28 days without further attention from a male. How many broods is open to argument, but five would be a conservative estimate.

The females should therefore be isolated for 28 days and if at the end of that time pregnancy is

not apparent and no babies have appeared she could be that rarest of creatures, a virgin female guppy, and our task is lightened somewhat. If on the other hand a brood appears before 28 days she should immediately be introduced to her new partner and, if he does his stuff without delay, the new impregnation will, to a great extent, subjugate the influence of any previous mating.

We have now started our breeding programme and when the resulting offspring have sufficiently matured any males which look like their dad should be retained and the rest discarded. The females should be separated from the males before they are 7 weeks old or they will begin to breed indiscriminately. The best way to do this is to remove them when the dark gravid spot appears in the genital region. All the females should be retained, unless they are deformed or obvious runts, because they do not reveal the traits they are carrying and may have some of the desirable ones. The next step is to select one or more of the better-looking females and put them back to the father; the number of pairings undertaken will depend on the tank space available, as the subsequent broods will have to be kept separate, and the best one selected for carrying on in-breeding.

If the father lives, continue to mate him with his grand-daughters and then great-grand-daughters and by this time the strain should be pure. If the first male parent dies use one of his first-generation sons.

Although pure for the traits we are looking for, the strain will now be deteriorating and we shall have to introduce hybrid vigour, which will make a very good subject for a future article.

MARINIST'S Notebook

By ROY PINKS

I HAVE described in previous notes some of the points I took into account when considering how to tackle the background of my marine tanks. When I cast my mind back I realise that I had a totally false impression of what the results of my labours were likely to be. It seemed that all I needed to do was to visualise some glorious seascape culled from a magazine and copy it. It would be something of a problem to get quite the right shapes and sizes of coral pieces, but once these, together with some suitable sea tree and shells had been assembled, all would seem to be

plain sailing. To some extent this was a reasonable assumption, as was also the belief that algae would eventually appear in some form or the other. I took it for granted that the latter would have to be eradicated as ruthlessly as in the freshwater aquarium.

The stark result was certainly arresting, but there was a sort of iced Christmas cake effect about it all which took quite a long time to dispel. Under conditions of minimum light a form of brownish red algae began to appear, but it was not until I tried a higher degree of illumination that the

varying shades of green began to appear. They varied quite a lot, but some were a most vivid colour and these had most certainly come to stay. These developments gently reduced the contents of each tank to obviously more natural hues, though there was a period when I feared that the buildup of brownish algae would get out of hand.

Perhaps the least pleasing part of the decor was the tank floor. Although the white gravel I had used was almost exactly the colour I wanted, there was a flatness about it that was never really relieved by the shells and small pieces of coral which I positioned in what seemed to be appropriate places. It was some time before I became aware of this particular fault, though by this time another factor had come into play. In the early days, when we only had the 'starter' fish to study, we were intrigued by the blue damselfish, which furtively carried bits of gravel in its mouth, removing them from one end of the tank and, perhaps, placing them either at the distant end or only a few inches away from the pick-up point. As this was the only fish which displayed the habit I began to think we had an eccentric, as there was no rhyme or reason in the placement of the particles. Of course, since then I have kept other species which have performed in exactly the same way, and I now know that this is a characteristic of many marine fishes, but the overall effect is that the contours of the aquarium floor take on a quite different—and certainly more natural—appearance once these operations have had their effect.

The circumstances of the aquarium certainly seem to make a lot of difference as to whether the fish become architects or not. I kept some clowns in one tank for about a year, but they seldom went near the bottom. In a small tank in which I have clowns and anemones the floor has troughs 2 inches deep in places, and this is caused when the clowns range themselves alongside their chosen anemone and vigorously fan the sand with their tails. This sends up clouds of grains which fall 2 to 3 inches away from the anemone, and in some cases the top of the sub-gravel filter has been rendered visible. This is said to reduce its effectiveness, but as the tank is well understocked, I am not in the least worried on this account.

There are many species which have their own peculiar effect on the covering of the tank floor. Some wrasse bury themselves in it, some triggerfish hurl it in all directions, and others chew it to smaller bits. I have some burrowing gobies which have made the most extraordinary series of caverns, in which they spend much of their time. They so carefully remove each grain and reposition it and having done so, study it, that I haven't the heart to spoil their work, particularly as they so obviously enjoy the seclusion of their little tunnels, which have so dramatically changed the character of this tank that it is now almost unrecognisable as the creation of which I was once so proud. One thing is quite certain: when next I set a tank up I will leave the topography to the gobies—they are better at it than I am.

Breeding *Julidochromis ornatus*

By DAVID MITCHELL

FOR me, *Julidochromis ornatus* is second in beauty only to its brother in species *Julidochromis mayeri*. Both come from Lake Tanganyika in Africa. To give you an idea of the size of Lake Tanganyika, it covers an area of 12,700 square miles and its maximum depth is 4,708 ft.

Although *Julidochromis ornatus* is a small fish, growing to 3 inches in length, it is a member of the cichlid family and not recommended for keeping in a normal community aquarium. The colours are a lemon yellow, with three dark-brown horizontal stripes in the upper half of the body and a large dark spot at the caudal base.

Sexing is not very easy; the only apparent noticeable difference is that the bottom horizontal line on the body of the female has a slight rise in the centre.

The size of the tank I used was 36 in. by 15 in. by 15 in., which was large but it certainly gave the

pair of fish plenty of freedom. The aquarium was set up with a 2 inch layer of $\frac{1}{8}$ inch gravel and a large assortment of rocks and slate so arranged that there was a number of caves for the pair to hide in. The water temperature was 78°-80° F, pH 8.0 and hardness 600 p.p.m.

The eggs were laid on the roof of one of the caves, in batches of eight to ten, totalling approximately 50 in all. The period of time taken was about 12 hours, the female laying a few eggs at a time and then having a rest. They were light green

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SAVE THE
VILLAGE POND
CAMPAIGN

Operation Save the Ponds



A CAMPAIGN to restore and protect the nation's village ponds was launched last month. The aims of the Campaign are urgent—to arrest the rapid decline in the number of ponds, to restore one of the most attractive features of the countryside and to save the many species of flora and fauna which are otherwise threatened—some with extinction.

The village pond, once the centrepiece of British village life and ranked in importance with church and tavern, has declined since the turn of the century. At the last count there were over 100,000 ponds in Britain. This figure is known to have dwindled daily by use of the ponds as 'inconvenient' dumping grounds, through neglect and in-filling.

If ponds continue to disappear the common frog, for example, will soon be common no longer. In some parts of the country the frog now exists only in ornamental garden pools. Britain boasts 27 species of dragonfly, many of which depend on the country's ponds. Eight species are now so rare that they are to be found only at a limited number of individual ponds. And, of all the British native plants in danger of

British Trust for Conservation volunteers tackle a pond restoration job. Available tackle carried on the 15-seater bus includes a glass-fibre punt and a winch for pulling out tree roots and branches.

extinction, one third depend for their survival on the moist ground of pond banks.

Experts such as Dr Franklyn Perring, head of the Biological Records Centre at Monks Wood Research Station, Abbots Ripton, Huntingdonshire, feel strongly on the need for pond conservation.

'Practically every field used by sheep or cattle had its own pond, and so did every village. This was certainly true of Cambridgeshire, which is probably a typical county. Ponds were once numbered in hundreds in any one locality. Now only the odd relic is left', says Dr Perring.

John Clegg, author of *Freshwater Life* and a leading authority on ponds, confirms this: 'British ponds are disappearing at an alarming rate. In Cheshire alone we estimate that field ponds are going at the rate of about two every week.'

The records of just one typical farm, in West Wiltshire, point to the necessity of launching an

energetic campaign to save, reclaim and maintain the nation's ponds and their wildlife. The farm's records, typical of those in lowland counties, show that there were 13 ponds to its 120 acres in 1880—not a century ago. By 1960 only one pond remained.

The well-kept village pond is, to this day, a popular attraction for all those who pass by. It has a tranquility all its own. A well-maintained village pond, complete with a few ducks and fish, can soon become a renewed focal point for local residents, schoolchildren and visitors alike.

Operation of the Campaign

The 'Save the Village Pond' Campaign, organised by the British Waterfowl Association and sponsored by Ford Motor Company Limited, depends mainly upon enthusiasm and voluntary labour. Restoration in itself need not be a costly operation though it does need to be carried out wisely. Overzealous reclamation could damage the habitat of the wildlife it is intended to save and encourage.

A full-time advisory centre has been set up to assist village groups and individuals who wish to save their village ponds. Christopher Harrison is Campaign Director and Geoffrey Kidner C.B.E. Assistant Director. Both men are well-known farming personalities and businessmen with village roots and have a keen interest in preserving the countryside's amenities for future generations.

The 'Save the Village Pond' Campaign has its headquarters at 111 Lambeth Road, London S.E.1, from where full details of the Campaign are available. A village group intent on doing what they can to save their village pond should first

write to the 'Save the Village Pond' Campaign's headquarters. They will then be sent full details of the Campaign, together with a simple questionnaire asking for details on the particular pond it is intended to save. A copy of the Campaign's book is also available, price £1.00 including postage. This gives chapter and verse on pond restoration techniques as well as providing a valuable reference work of pond wildlife.

As soon as a village group is formed, and before work commences, the Campaign staff will put the group in touch with local naturalist and conservation groups who will survey the pond and be able to give expert advice on how best to protect flora and fauna.

Most villages will be able to recruit their own work parties of volunteers whether from the adult population or from schools, youth clubs, or Scout and Guide groups. Should no labour force be available the Campaign is able to call on help from the British Trust for Conservation Volunteers. Their teams of young volunteers will be available to assist pond restoration groups.

The Ford Motor Company Limited has donated a Transit bus and all the essential equipment necessary for the Trust to carry out its pond restoration work for such groups.

When called in to assist, the British Trust for Conservation volunteers will make a small charge in order to cover nominal expenses—approximately £1.00 per volunteer per day. With their Transit equipped with trailered punt, rakes, saws, high-power winch and other essential gear, the volunteers will be able to provide a speedy and efficient service to assist many groups who wish to transform their village pond to bring pleasure to local residents and visitors alike.

Breeding *Julidochromis ornatus*

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in colour and oval shaped; for the size of the female, which was a little over 2 inches, the eggs were very large.

The parents had some very unusual and interesting ways of looking after the eggs. They very rarely fanned the eggs, although with them being laid on the roof of a 'cave' I should think that is not very necessary, as very little sediment can settle on them. Also, when the parents were disturbed they did not protect the eggs; they did the complete opposite and tried to distract attention away from the eggs by going into another

cave, and started cleaning and fanning the roof as if that was where they had spawned.

The young fry hatched in 4 days and were moved straight away to a new site in the same cave. The new site was a slit in the rock and all the young were hidden from view. At this point in time I had assumed the eggs had been eaten, as I could not see any fry or eggs in the tank anywhere. I only noticed the fry by chance on the seventh day after spawning. I entered my fish house and I left the door open as it was a warm and sunny day. I sat down to watch the parents, when I noticed something move on the roof of the cave where the eggs were first laid.

I first thought it was daphnia, as I regularly feed the parents on this, but when I looked more closely I could see approximately 20 young fry lying upside down on the roof. The yolk sac had already been used up so I started feeding with

Liquify liquid baby food, but this was ignored; I put some newly hatched brine shrimp in the tank, some of which was eaten by the parents, but when it had sunk down to the level of the cave the fry started dashing out, one at a time, eating one or two and then dashing back to the safety of the cave. Brine shrimp was fed twice a day. It was 3 days later before the fry were swimming freely in the tank.

The only positive parental care observed was at this stage; when I approached the tank the male

picked up one of the fry in his mouth and spat it back into the cave, but the rest were left to swim where they pleased, continually searching for food. The colour of the fry was grey with dark vertical stripes.

Twenty days after the first spawning the parents have spawned again in the same cave and exactly the same procedure was observed again. The young from the first spawning were allowed by the parents to swim freely in the cave and around the eggs of the second spawning.



by
ARPEE

Personal COMMENT

ONE of the widest and least well-founded of all misconceptions about aquarium keeping is that tank water needs changing every so often. It is a fear far more tenable to the uninitiated than the cost of equipment and fish or the untimely death of the latter, and of course all too many are put off entering the hobby by the gruesome prospects of trails of wetness across the best carpet, to say nothing of the unwanted physical effort involved in water-carrying. Most unfortunately it is difficult to expunge the memories of an over-ripe tankful merely by intellectual argument, and it is not always possible to produce concrete evidence in support of the view that freshwater aquaria, at least, can be left indefinitely, the only requirement being to top up with rainwater to make good evaporation.

It so happens that I have one tank which has been set up for 10 years and another which has been undisturbed for about half that time. When I disclose these facts to visitors I sense that they twitch their nostrils in surprise, detect some indefinable something in the air, and make every sort of excuse to transfer their presence elsewhere without delay. Others assume that the whole thing is a fishy story concocted to mislead the gullible, for whoever else would believe that such clear-looking water could have been left for more than a week or so without having 'gone off'? The more we protest that the process is really quite simple, the more do the doubters protest that they have experienced Mr X's tank from several houses (or even blocks) away, and ask how we

account for the effluvia which arose from that, particularly bearing in mind that it had only been set up for 6 weeks!

It is a sorry fact that, despite the very basic advice that all will be well if you understock your tank with fish and slightly underfeed them, more beginners than not completely ignore this and do exactly the reverse. The water in a tank which has been placed in a suitable position (not too much sun and not too much shade) will probably undergo only one major change of appearance after the initial setting-up phase, and this is very shortly after that particular operation, at which point it will turn a little cloudy and may smell somewhat peppery. After a week or so it should have become much clearer, and thereafter the process of 'ageing' will probably result in the water assuming to an increasing extent the appearance (although regrettably not any other characteristics) of gin. In the absence of filtration the water seems to get 'heavier', but filtration and aeration provide a degree of buoyancy, usually without detriment to the clarity of the medium. The smell of the water as it ages will probably become more and more earthy, but at no stage, if the whole affair is working properly, will there ever be the remotest suggestion of an unpleasantness, and the nose can be relied upon as a sound indicator of water condition, common colds apart.

Topping up with rainwater is recommended to avoid a build-up of the salts which commonly occur in tapwater, it being held that this condition will, in the long term, adversely affect fish life. Aquarium chemistry is a strange thing because it is always theoretically correct and so often practically wrong, and I think many aquarists who have topped up straight from the tap over the years will have found not much wrong with their aquaria, though a lot depends upon what species of fish are involved. It was said at one time that tanks would become so poisoned by the excreta of animal life that if the water were not periodically refreshed by new intake, its inhabitants would surely die or deteriorate. Although the advocates of balanced aquaria felt that they had dispelled this particular worry by incorporating a wide range

of living things in a given volume of water, this theoretical means of balancing up and cancelling out, biologically, contained all sorts of qualifications because hardly two situations were really comparable. It has so turned out for most of us that if we remember the basic rules we can ignore the byways opened up by the chemists and still get by.

The scientific side of aquarium management, is not to be denigrated, however, for it is of real importance when embarking into specialist activities such as breeding or keeping individual picky species. The marine aquarist, too, is looking towards the chemist more and more, though I am far from convinced that even here we should accept so unquestioningly opinions which too often appear to be stated as facts.



My son brought home from school the other day some publicity material issued by the RSPCA. It included the statement that the Society provides 'watchdogs' at ports in the U.K. who are on the lookout for abuses in the transit of live animals. Tigers to tortoises. Cattle to catfish. Mynah birds to monkeys. It asks whether exotic animals are really needed as pets and whether magnificent creatures should be kept in captivity many thousands of miles from their natural habitats.

There will hardly be a pet keeper in this country who will argue with the Society about the need to establish and maintain humane shipping methods, and indeed some of the outrageous habits of shippers in the past deserved nothing less than jail sentences. Commercial and legal morality, however, presumably let them off scot-free. I suppose that tortoises are victims of the worst abuse and I have met many dealers who have been saddened and revolted by what they have seen; in the main they have merely turned to other sources of supply, but how much better it would have been for all if they had immediately applied sanctions against those who had in any way, however small, contributed to sub-human practices.

Thus far I feel that the Society and pet-keepers are at one. The questions as to whether we need exotic pets and whether it is right to keep them will upset a lot of people and perplex many others. It is nothing new, though, to labour these points, but I honestly question whether there is much real purpose to be served in so doing. The sweeping generalisations involved in such rhetorical questioning may do some good for the main cause because they stimulate discussion, thereby furthering its objective, but those concerned with right and wrong will find it most difficult to be

completely honest on the subject, mainly because there are so very many facets to what is a complex situation. Few will argue whether it is right or wrong to keep a guppy in a fish tank, but even this situation could get a bit out of hand. Suppose that the tank is only 3 inches each way, and that it stands on a windowsill in such a way that it is almost frozen in winter and boiling in summer? Or is it O.K. to put the creature in an 80 gallon tank on its own? Or into a 30 gallon tank in company with an oscar?

It may be clear from this that there are countless permutations of acceptability or otherwise for each creature we have to do with, and whether these are truly in its best interests or not may often take time to determine. All research into wildlife must involve the keeping of captives and the recording of their behaviour, and in many cases this will contribute materially to the survival of the species, not the opposite. One cannot exactly quantify the actual contribution of the pet-keeper in this particular context, but over a period it must amount to something.

Animal welfare workers often get emotional about the confined creature, and we tend to say (especially if the creature in question is one we happen to keep), that it is often better off in captivity than it would have been left wild. This is a very convenient way of excusing ourselves, and it is as often false as it is true, because in the long run almost everything depends on the skill and resources of the pet-keeper in relation to the nature and requirements of the animal itself. One can go still further and say that different ages of the same animal require their own special treatments, and therefore the mere act of trapping and shipping will react on the animal in some relationship to the creature's age.

I think pet-keepers will need to be watchful that the RSPCA doesn't run away with itself in its efforts to get a fair deal for animals. The very great majority of pet-keepers are just as keen on this, even if it may sometimes mean that they have to pay more for what attracts them. In my experience, although there are many utterly stupid fishkeepers and some dishonest and unscrupulous dealers, the majority are not like this. Most are born with an innate concern for animals of some form or another and will go to extreme lengths to attain their maximum welfare, frequently at some personal sacrifice. Most of the animals which come into the pet category accustom and acclimatise unexpectedly well, and those which protest overmuch leave too indelible a mark on their keepers to incline them to persist in attempts to

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A Choosey Breeder—

The Severum Cichlid



Cichlasoma severum

By RUDOLPH ZUKAL

Photographs by the author

THE larger representatives of the cichlid family are avoided by most aquarists because of their infamous habits—brawling and plant-eating and, of course, their sheer size. In spite of this, a few of them have become valued tank inhabitants—some species of *Aequidens*, for example, *Pterophyllum* and, not least, this fish, the 'severum'.

But first a few words of introduction. In its home waters in the northern parts of South America, the Amazon basin, the Magdalena river and Guyana, *Cichlasoma severum* grows to some 20 cm. (8 inches), though in captivity its maximum length is seldom more than 6 inches (15 cm.), but nevertheless it will live peacefully with much smaller fishes and can be put into a community tank with them. This is not true, however, of a pair of severum at spawning time. It has a deep, oval-shaped body, compressed at the sides. Colouring varies according to the fish's mood and also, in wild-caught specimens, according to the locality in which it originated. The colour range is from brown to green. The belly quarters always brighten in colour during courtship and spawning and when the fish is stimulated can turn to a gleaming gold. The very characteristic blood-red iris of the eye does not vary.

Translation by F. MARSH



A breeding pair of severum cichlids during the courtship phase preceding spawning. The male (right) displays to the female and repeatedly nudges her.

Severum cichlids require warmth, so their water temperature must not be allowed to fall below 72° F (22° C), particularly during the winter months or else you will have a case of fin rot to cope with. As I have said, except at spawning time severum are peacefully inclined and swim majestically through a large tank taking little notice of their companions. Although they often remain quite timid for a long time, with patience one can win their trust. At feeding time, they will come gradually nearer until finally they can be hand-fed. They thrive on plenty of the larger types of live food and they should be given a supply of vegetable food; otherwise they may turn to the finer plants to repair the deficiency in their diet. These fish

were once called *Heros spurius*.

Sex differences are very difficult to recognise. The male has been reported to have more red flecks on the scales and worm-like markings in front, but I did not notice this with my pair. What with the colour change of both fish when spawning started the only way I could differentiate between them was by recognising the female's extended ovipositor and rather shorter fins.

Breeding is not easy either. The best way is to wait for a male and female to separate themselves from a group of severum after noticeably seeking each other's company. Not every male is suitable. If you notice pairing behaviour between two fish they should be placed in a large, plant-free



When a spawning site is selected not only the stone but the adjacent gravel is 'cleaned' by mouthing.



A male severum cichlid fertilises the eggs deposited by his mate as he swims over them. Not all severum pairs will look after their young in an aquarium.

in the vicinity being mouthed up and spat out again. Just before the spawning actually took place the display excitement abated and finally the female laid a great number of eggs (it can be as many as 1000 or so).

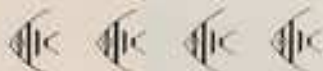
Some severum pairs will tend the young but some, on the other hand, will not and rather than take the risk it is better, in my opinion, to remove

the parents once the egg-laying is complete. An air stone placed so that the eggs are continually swept by a very gentle air stream then takes the place of the parents. Once the fry are free-swimming they must be fed with the finest live food and it really must be tiny food. The young fish become sexually mature in their second year of life.

Personal Comment

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do the impossible. A sad creature makes for a sad man, and that is not the sort of pet-keeping that I know of.



The British Marine Aquarists' Association has been undertaking, during the past few months, a review of evidence on the question of collecting saltwater fishes by the use of drugs and poisons. The furore which followed my articles in PFM last year caused some to search their consciences and

others to dig more deeply into their entrenched positions, and, not unnaturally, a lot of emotion was released. The BMAA investigators set out to present an unbiased report on the subject, and contacted numerous sources for information, and I am looking forward to digesting the result of the labours. They have an abominably difficult job to do, but I have confidence that it will be approached in objective fashion, and whatever the conclusions may be they should be read with respect. I have been in correspondence with one half of the investigating team, Graham Robertson, for some time now on all sorts of matters about marines, and I have much admired his industry on behalf of the marine hobby in general, together with his straightforwardness. The efforts put in by such as these two researchers usually brings them more kicks than halfpence: I hope that in this case, even though I may not necessarily agree with all they say, they will get the credit due for a part-time project of this sort. I suspect that if they achieve a healthy readership this will be enough reward, and if I have hereby whetted your appetites, I am well pleased, too.

COLDWATER SCENE



By FRANK W. ORME

VERY often at this time of the year the novice goldfish breeder, and occasionally even the more experienced, will discover that finding food in sufficient quantity to feed both the adults and the increasing population of the season's young fish is presenting quite a problem. Although some may disagree, I do not believe that it is good practice to raise fish entirely upon dried foods, good though some may be.

Fish, like humans, appreciate variety in their meals. In the wild an abundance of different foods is usually available, both animal and vegetable. Unfortunately we fishkeepers cannot rely upon Nature to feed our fish without assistance. We must therefore either breed or collect suitable live foods to provide the essential change of menu and give a reasonably balanced diet. This month 21 different live foods are discussed, most are easily obtained, some normally being available from your local dealer.

Daphnia. 'Water fleas'—crustaceans that may vary in colour, being green, red or black, depending upon the food they have ingested. By straining through various mesh size nets the daphnia can be graded to suit practically all ages of fish, but a word of caution: do not put an excess in the fry tank or the daphnia will compete for the dissolved oxygen and this will be akin to overcrowding.

If a stretch of water is found to contain daphnia make a few sweeps with a fine mesh net. This may possibly secure enough to provide several feeds. Transport the daphnia home in a covered bucket of water and upon arrival tip them gently into a white bowl; closely inspect the catch and remove any beetles, leeches and other creature that is not a daphnia and does not fit the description of other live foods. Careful attention in this way will avoid introducing undesirables. Finally net the daphnia and place them in clean water, making a last check to ensure that you have only clean daphnia for feeding to your fish.

Mosquito larvae. Often found in daphnia pool and rainwater butts, these are the larval stage of *Culex pipiens*. The adult lays blackish canoe-shaped egg-rafts upon the surface of still waters. Depending upon the temperature, these eggs hatch in 1 to 5 days. These insects are air-breathers, air being taken in through the tail, and

Providing Live Foods in variety for Breeding Goldfish

will be found hanging head down from the water surface. If disturbed they will immediately swim with a whipping motion deeper into the water only to return as their air supply runs out. Depending upon the size of the larvae they can be fed to fish in all stages of growth. An excellent food that will not deprive the fish tank of oxygen.

Bloodworms. Usually half an inch in length, these blood-red creatures swim with a figure of eight motion. They are the immature form of the midge *Chironomus*. Frequenting similar locations as daphnia, they spend much of their time in the bottom mud of ponds feeding upon decaying vegetation. During sunny periods they can sometimes be found swimming in fair numbers and can be netted. Possibly the easiest method of gathering bloodworms is to take up a quantity of the mud and place it in a bucket of water. Stir the mud and then pour off the worms when the detritus has settled, but before they have time to re-enter the muck. Strain through a net and swirl before placing in clean water. Bloodworms are excellent food for the larger fish, if you can obtain sufficient of them.

Glassworms. Glass-like transparent larvae of the plumed gnat (*Chaoborus*), which is sometimes found with daphnia. They live in similar conditions and grow to a length of three-quarters of an inch. When they are netted in quantity the net will appear to contain a mass of wriggling jelly. This food provides a welcome change of diet for the larger goldfish when other live foods are in short supply as it can often be netted in large amounts, from suitable waters, during the colder months of the year. Equipped with very powerful jaws the larvae are reputed to be able to eat fish eggs and small fry. I have witnessed the glassworm seizing a daphnia and would not therefore doubt its reputation.

Tubifex. Thread-like reddish worms that are related to the earthworm. The fouler the conditions the better this creature survives, and very large colonies of tubifex can often be found near to sewerage outfalls where they will form a waving mud-surface mass of rusty red threads. With heads buried in the mud they feed on the bacteria created by the sewerage, but will withdraw like a flash, if they are disturbed, into the mud. The fact that tubifex live in such filthy

conditions has led to many arguments amongst aquarists as to the advisability of using them as a food.

In my own view they are quite safe to use provided that common sense is used and the worms are thoroughly cleaned before use. A very simple method of cleaning, and one used successfully by many fishkeepers, is to place the worms in a bucket of water, in which they are swilled around to remove as much of the filth as possible: the dirty water is then poured away and replaced by fresh. Stir the ball of worms and break up the worm mass to release any dead tubifex and muck, and pour this rubbish away when the worms have re-formed into a ball. The ball of worms is then placed in a shallow pan of water, into which water is allowed to drip and slowly overflow; during a period of 7 days the ball of worms is broken up at frequent intervals. Over this period dead worms and muck will be flushed away, together with the vacated internal filth of the worms, and you should be left with a ball of perfectly clean and safe live food, that is 100% solid meat, all ready to feed to your fish. Feed whole to large fish or chop the worms for the smaller fish.

When feeding with tubifex do not offer too many at a time. If the fish are in a planted tank, and any of the worms escape the attention of the fish, the uneaten worm will burrow into the gravel base and this could lead to the floor of the aquarium eventually being covered by a sea of waving tails. Do not be misled into thinking that the escaped tubifex will provide a built-in, readily available, supply of food. The truth is that tubifex react so fast (they quickly withdraw into the gravel at the approach of danger) that very few will be caught by the goldfish.

Gammarus. A scavenging freshwater shrimp that swims in an upside-down position. It measures between one-quarter and one-half inch in length. As it is often found in thick clumps of submerged vegetation growing in slow-moving streams, the easy method of obtaining *Gammarus* is to pull up a mass of the plants and hold them over a net, when very often a fair number of the creatures will tumble into the net. An excellent food for the larger goldfish.

Asellus. A flattish crustacean (the water louse) that closely resembles the common woodlouse, and is up to half an inch long. Feeding upon decaying vegetable matter, it is found in similar conditions to the freshwater shrimp and may be obtained in the same way. Another good food for the larger fish.

Water Snails. These can be crushed and fed to the fish, which will pick the flesh from the broken shell.

Maggots. Accepted by most of the larger fish, maggots can be purchased from most fishing tackle suppliers.

Earthworms. One of the best of foods, free from any aquatic pests or diseases, it offers a solid meat diet that can be chopped or mashed to suit the size of fish to which it is being fed. Recognised as an excellent food to help bring goldfish into breeding condition.

Whiteworms. These worms (*Enchytraeus*) are related to the earthworm and in my opinion, despite what some may say, form a first-class food for all ages of fish, from half an inch to adult size. In fact I have, in the past, raised goldfish to adults on a basic diet of whiteworms without any mishap or fattening of the fish. A worm culture is very easy to set up and maintain. If properly managed, a culture will normally provide sufficient numbers of worms for feeding to your fish whenever they are required.

A 12 inch square wooden box about 4 inches deep will make a suitable culture container (I use three such boxes to avoid overcrowding). Fill the box with moist Irish moss peat, or you can use three parts of peat, three parts of sterilised garden soil and one part of silver sand. Lightly firm the mixture, at the same time making a depression in the centre. Into this hollow the starter of whiteworms should be placed. Place a small piece of damp brown bread on the top of the worms and cover the surface with a square of loose fitting glass. Across the box a piece of hardboard should be laid to exclude light, because these worms prefer the dark. Keep the culture as cool as possible and only add more food when the previous bread has been eaten. Some patience must now be exercised. As the worms increase in numbers so food can be given at more frequent intervals. After a time you will find that a slice of bread will be required each day, but do not take worms until the rate of population growth proves the culture to be established and flourishing. Extracting the worms should not be a problem; normally thick masses of them will gather around the edge of the food from where they can be lifted quite easily, free of dirt, with a pair of tweezers.

Micro worms. A tiny nematode worm that, because of its small size, is admirably suited for feeding as an early food to small fry. This live-bearing worm is easily cultivated but, so far as I am concerned, suffers a drawback in the vinegar smell that is given off. Any shallow water-tight container will provide suitable living quarters; a piece of glass should be placed over the top to prevent the culture drying out. For the growing medium a stiff mixture of oatmeal, made with half milk and half water, is ideal. Place this into the container roughly a half an inch thick, when cool. The worms breed on the surface, so spread the starter culture over the surface but do not mix into the oatmeal. Place in a dark, warm position, where the temperature will remain around the

75 F mark. After a few days the worms will have multiplied to such an extent that the surface will seem to shimmer with the movement of the worms over the oatmeal. Soon a population explosion will take place and the worms will start to migrate, in skins, up the sides of the container. They can now be gathered with a knife blade and fed to the hungry fry. At approximately 2 week intervals a new culture should be started, and this will

maintain a healthy thriving source of micro worms.

Although there are other forms of live foods, those which I have described are the most popular with fishkeepers. Combined with good-quality prepared foods, the feeding of live food will provide a balanced and varied diet. Your goldfish will show their appreciation by always swimming with fins alert.

Readers' Queries Answered



Otocinclus and White Spot

I have recently been told that it would have been better not to have bought two Otocinclus vittatus as they are liable to encourage white spot in the tank. Should I get rid of them at once?

If you have put new arrivals straight into your main tank, then whether they are *Otocinclus* or guppies you have gambled with the chance of introducing white spot. The presence of *Otocinclus*, once they have been quarantined and shown to be healthy, will not start a spontaneous outbreak of white spot in a tank. *Otocinclus*, as algae eaters, fare very badly in transit and in holding 'camps' where algal growth may be at a minimum (certainly it is in transit). They arrive in a debilitated condition and if they come into contact with the presence of the white spot parasite are likely to die from the outbreak. It is very important that they should be placed in a quarantine tank and fed well on small quantities of cooked spinach or green individual plant leaves or roots that may be coated with algal growth. Well fed and 'clean' from a 2-3 weeks' period of quarantine, they may perfectly safely become members of your community tank.

Excess of Tubifex

I have noticed for some little while now that there is tubifex growing in my

tank gravel. The worms seem to be living as they wave about; it seems quite a useful way to keep a supply of food 'handy'.

You are over-feeding with tubifex and are liable to create a disaster zone in your tank. Some tubifex may live for a few days—these are the ones you can see waving about—but there are almost certainly even more dying or lying dead under the gravel and if there are enough of them they will cause pollution to the entire tank. You do not state whether you have any kuhli loaches or catfishes, for instance, in the tank, though even these are not going to be interested in eating quantities of dead tubifex. The tubifex must be removed from the tank—they are probably to be found in just one area underneath the feeding aperture, so siphon out both gravel and its contents and thoroughly wash the gravel before returning it to the tank. Use the tubifex for feeding much more sparingly.

Water Evaporation

I find that I don't have time to siphon out my tank but I would be able to quickly fill it up to replace the water loss. I believe, however, this is not good practice and although I can't really see why I always hesitate to do it.

The occasional replacement of evaporated water without siphoning

and removal of some of the tank water itself will do no harm. But if it were done continually the result would be a gradual increase in water hardness. When water evaporates the dissolved salts are left behind, so that mere replacement of evaporated water does nothing to eliminate these. Unless you are using distilled water, the replacement water is itself introducing yet more dissolved salts into the aquarium since no natural water is absolutely 'pure'. If some of the tank water is removed at the same time, you are at least exchanging a concentrated solution (the old water) for a dilute solution (the replacement water) and this will prevent the increase in hardness of water, that does occur very gradually in most aquaria with time, from taking place.

Apple Snails

I have obtained some 'mystery' snails to help keep down the algae in my tank and I have noticed lately what could be snail eggs but they are well above the water line. Are they likely to be apple snail eggs and should I push them down into the water for safety, or will the other fish then eat them?

The eggs you refer to could well be those of the apple snails, *Ampullaria cuprina* is capable of living out of the water in its natural habitat of South America, where the shores of the freshwater areas are humid and damp. It is able to use both underwater and atmospheric oxygen. Make certain that the eggs are not submerged if you are siphoning out the tank and replacing water and also make certain that overhead

lighting does not dry the eggs out completely. They should then hatch within 3 to 4 weeks. Incidentally, apple snails require more than algae for food. They will eat tubifex, dried food or porridge oats that has sunk to the bottom of the tank and scalded lettuce leaf and cooked spinach, so make certain that they are receiving enough food for their requirements.

White Worm Culture

I have noticed that the worms in my white worm culture seem to be much larger than they were. There are fewer of them and whereas I used to get a mass of barely distinguishable

worms I can now easily pick up a single white worm. What would be the explanation of this? I would really prefer the old 'mass' of worms as the present worms are too big for some of my smaller fish.

It does rather sound as though your white worms are not breeding as well as they were and that more of the individual worms are reaching maturity on the food supplied. *Enchytraeus albidus*, which is the usual species of 'white worm' that we feed our fishes, does grow to a length of about 1 inch and a diameter of 1 mm. If there are fewer worms in different stages of growth then the individual worm, on reaching its full length, will not be an

inconspicuous object. There are other, similar, species of 'white worms' that may possibly have replaced the *albidus* in your culture, but more likely a little slackness on your part in looking after the culture has produced a temporary reduction in egg laying. Have you been feeding the culture regularly and making sure that it doesn't become too warm and doesn't dry out? Has there been a change in temperature from the 50-60°F that is most suitable? Is the earth surrounding the culture still 'sweet' and not sour? Like earthworms, each white worm contains male and female reproductive organs (the state of hermaphroditism) and the eggs, which are very

OBITUARY

Mr R. G. Mealand

IT is with regret that we report the death of Mr R. G. Mealand in hospital on 10th March. Bob Mealand became well known in the organised hobby as an enthusiastic and skilled aquarist soon after World War II, when it was in the field of livebearing fishes that he specialised, developing new strains of platy-swordtail hybrids. He was a popular show judge and lecturer to clubs, where his strictly practical, experience-based approach to helping other aquarists was always greatly appreciated. He also contributed articles to the aquatic press and became a prominent member of the Federation of British Aquatic Societies Standards Committee.

In the days when such structures were rarities Bob designed and built a 24 ft. long fish house in the garden of his Putney, London, home and in this (equipped with telephone and radio) he delighted in talking fish and having a 'leg-pull' with visitors. The meetings of The Twenty Club, of which Bob was founder member and secretary, were held at his home and he was always highly amused if he thought someone believed that the limited membership of the Club had been



adopted to form an 'elite' among aquarists—'We just want to talk "tiddlers" without any club politics' he used to say.

Born in Highbury, and living at Brentford during his youth, Bob first went to live at Putney over 60 years ago, and for 40 years was very well known in the area as a master plumber. He will be sadly missed by his close friends, and by the wider

circle who looked forward to seeing him at least at those events such as the annual Hendon Convention in which he confined his visits in recent years. Bob Mealand was a widower. To his son and daughter, Robert and Beryl, our sincere condolences, and they can be proud of the fact that the hobby that was so loved by their father is richer by the services he gave to it in his lifetime.

difficult to see with the naked eye, see laid in transparent cocoons on or very near the food you supply them with. If the conditions are suitable and the food supply plentiful the worms should soon start reproducing again.

Breeding *Metynnis*

Could my Metynnis (schweinielini) be a pair? I haven't had them so very long but one of them has started pressing up against the other as it swims. I can't really decide whether it is display behaviour or whether one is just evil-tempered and is trying to prevent the other one mating.

An indication of aggression is more likely to take the form of side-on attacks whereby the aggressive ones butt and push its 'partner' into a corner. It is true that during the pre-spawning 'play' the male uses mouth in the area of the female's ventral fins but this is more of a controlled action and reasonably gentle whereas an aggressive attack usually takes the form of a swift butt or two in the sides with the aggressive swimming off to take up its stand for another rush. The swimming together and pressing against the side is more likely to be an indication of the spawning pattern.

Conditions to aim for if you wish to spawn these fish is a large (36 in.) spawning tank, aged but well-aerated water, a high temperature (80-84°F; 27-29°C) and floating plants. The pair should be conditioned beforehand with live food and plenty of vegetable matter such as soaked spinach, scalded lettuce and floating plants. A commercial breeder of these fish has indicated that they nearly always spawn in the morning. The eggs are fairly large and some will sink from the plants to the bottom of the tank. The parents are not known to be egg-eaters but for safety should be removed as soon as the spawning is completed. It has been suggested that the eggs are sensitive to light so the tank should be covered to prevent too much from reaching it. According to the temperature the eggs hatch in from 2 to 4 days and the fry are free-swimming some 3 days later. Their first food should be newly hatched brine shrimps and *Cyclops*, progressing to moina worms, larger brine shrimp and so on.



TWO recent meetings of **WELWYN GARDEN CITY AS**, both very enjoyable and interesting, typified two opposite facets of the hobby. Publicity Officer Mr M. Graham writes: 'Our thanks first to Mr B. Pye who gave us great entertainment value and considerable knowledge with his quiz slide-show "So you think you are an aquarist?". The marking indicated we may have a few budding geni in the society, and cheating must have been in moderation as no one obtained more than maximum marks. On the second occasion Mr D. Marlborough, secretary of the British Ichthyological Society, was impressive throughout a demonstration and during discussion time, when he dissected fish to discuss their organs and related physiology. A good educational evening on fish anatomy, and all members present benefitted and improved their education. The Society meets at the South Hut, Great Dell, Welwyn Garden City, on 1st and 3rd Mondays of the month, 8.00 p.m. New members and visitors are always welcome. The programme for the next 2 months will be: 1st April, Mr J. Parker & Mr R. Forder discussing Gadgets for the Aquarist; 15th April, Easter Monday, no meeting; 6th May, Mr R. C. Mills talk on Angels; 20th May, Mr D. Lambourne on Cars'.

WHEN Mr A. Tufts of Hemel Hempstead & DAS visited **BASINGSTOKE & DAS** and delivered a most interesting talk on his experiments with tranquilisers in the aquarium, members were fascinated to see how the most elusive of fish, e.g. the kuhli loach, can be captured with ease from furnished aquaria after application of a tranquillising drug to the water. Table show results for the evening were: Novices: 1 & 3, Mr A. Cripps; 2, Mr R. Onslow. Plats: 1, Mr W. Turner. Senior adv: 1 & 3, Mr B. Bisson; 2, Mr J. Jackson. Subsequently the club played host to Mr H. Aylott, who presented a very informative talk on killifish during

which his extensive experience and knowledge of the subject showed to the full with his recollections and anecdotes from many years of keeping these fish—including a way of hatching obstinate eggs by taking them for walks. The Society have also enjoyed a very well supported social evening when wives and girlfriends were able to find out what happened on Friday nights when the gentlemen all disappear to 'talk fish'. A discotheque and plentiful food supplies were available, and everyone relaxed and enjoyed the evening thoroughly.

MEMBERS of **HASTINGS & ST LEONARD AS** very much enjoyed Mr B. Funnell's lecture on 'How it all began'. He discussed his career in the hobby from its beginning as a schoolboy with an interest in goldfish. In 1928 a local fish shop ordered him some fish from London and his interest in other fish species grew. During the war his fish house was bombed but he salvaged some corpses from the debris and they are in the Natural History Museum in Kennington. The table show (judge, Mr M. Penfold) for egglayer pairs was won by Mrs A. Adams, and the breeders livebearers (judge, Mr H. Carey) was won by Mrs M. Greig. The second meeting of the month was devoted to a practical demonstration of the different ways of filtering aquarium water.

AN enjoyable evening was had at Newport, when **NEWPORT AS** and **RATFA** held their leg of the C.N.A.A. knockout competition where **RATFA** won by 24 points to 18, the judge being Mr R. Wigg of Llanywit Major AS. A film show on water pollution called 'Let The River Live', which was shown by Mr C. Short, completed the enter-

THE BRITISH ICHTHYOLOGICAL SOCIETY is holding its AGM this year in central London. It is at County Hall, London, SE1 on Friday 24th May at 7.00 p.m. (nearest station: Waterloo (B.R.) or Westminster (L.T.)). The Society's annual subscription is £1.00, plus 50p entry fee and enquiries should be directed to the secretary, Mr D. Marlborough, 60 Newfields, Welwyn Garden City, Herts.)

AN exhibition of fish and reptiles is being staged as part of the Tiffin School Fete (Queen Elizabeth Road, Kingston, Surrey) to be held on Spring Bank Holiday, Monday 27th May. Any Surrey aquarists interested in participating are invited to contact Mrs. M. Kane, 10 Cambridge Road, Kingston, Surrey (phone 01-546 9259).

tainment. Members spent an interesting 2 hours on Sunday afternoon at the Cynrig Salmon Hatchery at Llanfrynach, Breconshire, where they were shown all the preparations which go into the catching of the adult salmon to the breeding of the fry and the eventual release of the smolts back into the river after being reared for 2 years at the hatchery.

HORSFORTH & DAS entertained their visitors at their annual Members' Show with a starts competition and a bingo session. Mr P. Moorhouse judged the fish and results were: Anabantids: 1, Mr P. J. Smith; 2, Mr J. Dunn; 3, Mr C. Wood. Catfish: 1 & 3, Mr P. J. Smith; 2, Miss J. Helm. Cichlids: 1, Mr J. Dunn; 2 & 3, Mr J. Wood. Pairs: 1, Mr B. Rimmacles; 2, Mr J. Wood; 3, Mr J. Dunn. Aov: 1 & 3, Mr A. Hardcastle; 2, Mr C. Coens. Barbs: 1, Mr J. Dunn; 2 & 3, Mr B. Rimmacles. Characins: 1, Mr B. Rimmacles; 2, Miss C. Wood; 3, Mr C. Coens. Juniors: 1 & 2, Mr M. Kelly; 3, Mr D. Holdsworth. Best Fish in Show was a marble angel entered by Mr J. Dunn.

234 entries were benchted at the **CATFISH ASSOCIATION (GREAT BRITAIN)** first Open

Show. Judges, Mr C. Brown, Mr A. Blake, Mr Durrant and Mr Nicoll, also helped to re-classify many of the fish, and thanks are also extended to Mr G. Howes of the British Museum for identifying many of the species not known to the Association. Winners of the gold pin, the King trophy for Best Fish in Show and the Ivy Brown trophy for Best aov Catfish were Mr & Mrs Sharp of Sittingbourne, Kent, with a *Microglanis paralyticus*. Winners of the FBAS Supreme Championship Class and the Cruickshank trophy for Best *Corydoras* or *Brochis* were Mr & Mrs Murphy of Ealing with a *Corydoras schwanzi*. Highest pointed society was Ealing and the best junior entry belonged to Miss Trudy Hedges of Bethnal Green. Remainder of results:

Go. Bagridae, The Ice Cap: 1, Mrs S. Eason (SLAS); 2, Mr L. S. Derrick (Croydon); 3, Mr R. A. Reeves (Croydon). Gp. Callichthyidae, The P. & D. trophy: 1 & 3, Mr B. Jones (Barnstaple); 2, Mr J. Burt, Gt. Dorset; J.C. trophy: 1, Mr T. Pithery (Northampton); 2, Master N. Tully (Dorset); 3, Mr J. Connolly (BGAS). Gp. Loricariidae, The Chalmers Cup: 1, Mr R. Goodson (Bournemouth); 2, Mr B. Bosson (Barnstaple); 3, Mr D. Allison (Hendon). Gp. Mochokidae, The Committee Cup: 1, Mrs S. Hedges (BGAS); 2, Mr M. Savage (Barnstaple); 3, Mrs M. Neherrell. Gp. Pimelodontidae, Ben Martin trophy: 1, Mr & Mrs Sharp (Catfish A); 2, Mr W. F. Sutton (Catfish A); 3, Mrs M. Neherrell. Gp. Schilbiidae, The Catfish Shield: 1, Mr W. H. Oselow (Ealing); Gp. Sisoridae, The Cowled Cover: 1, Mrs J. Adams (Catfish A); Gp. aov, The Filippic Tan Bag trophy: 1, Mr & Mrs Guest (Barnstaple); 2, Mrs M. Neherrell; 3, Mr J. Hughes (Barnstaple). Hr. *Brochis*, The Bonny Cup: 1 & 2, Mrs M. Neherrell; 3, Mr C. Walker, Hls. *Corydoras* 21 in., The Southview trophy: 1 & 3, Mr & Mrs Murphy (Ealing); 2, Mr B. C. Barton (SLAS). Hr. *Corydoras* over 21 in., The May trophy: 1 & 3, Mr J. Hughes (Barnstaple); 2, Mr T. Jones (SLAS). Hr. The Moody trophy: 1, Mrs S. Hedges; 2, Mr B. Bosson (Barnstaple); 3, Mr W. H. Oselow (Ealing). NG. aov Catfish pairs, The Old News trophy: 1, Mr D. Allison (Hendon); 2, Mrs E. Lambourne (Barnstaple); 3, Mrs J. Adams (Catfish A). NH. *Corydoras* & *Brochis* pairs, The Five Ness trophy: 1,

BRIGHTON & SOUTHERN AS invites societies to hire one of their slide/tape lectures on General Fish-keeping, Open Show Fish, and Plants. All enquiries please to Mr Z. Browning, 34 Rowan Close, Portsmouth, Brighton, Sussex: phone Brighton 419911.

Mr L. Brazier (Southern); 2, Mr W. W. Oselow; 3, Mr J. Hughes. NH. *Corydoras* & *Brochis* Breeds The Bonny trophy: 1, Mr P. Moye (Salisbury) Special Club, The Dandy Trophy; Mr W. F. Sutton (Catfish A); 2, Mrs M. Neherrell; 3, Mr W. Oselow.

ANOTHER Society deciding not to hold an open show this year is **WEYMOUTH AS**. In future the Society's Open Show will be held bi-annually. Members have enjoyed a demonstration by Mr C. Taylor on making all-glass tanks, and a talk by Mr M. Cleall on buying fish and growing them on to show standards—giving them a varied diet with plenty of live food and swimming space being the best way. At the March meeting, over 50 members were given a talk on tropical catfish and *Corydoras* by the Society's president, Mr P. Carter. He gave a general outline on the keeping and breeding

THE BUCKLAND & MILBER COMMUNITY ASSOCIATION has just formed an Aquarist Section. Although there are only eight members at present, everyone is very keen and anxious to link up with local societies (Newton Abbot, Devon) and to receive helpful advice on how best to run an aquarist society. Would any society prepared to give the benefit of their valuable knowledge please write to Mr R. Hambley, 7 Drake Road, Newton Abbot, Devon.

THE TYNE-TEES AREA ASSOCIATION of the FBAS presented its first Aquarist Convention in the north-east on Sunday 24th March and the Association's efforts, particularly those of Mr George Liddle, provided the audience with a most impressive feast of films and lectures on aquatic subjects. Members of societies affiliated to the FNAS on this occasion joined with their fellow aquarists affiliated to the FBAS in a thoroughly enjoyable occasion, and although far too many local aquarists failed to take advantage of this opportunity to hear such

fine speakers, the appreciable-sized audience included fishkeepers from a wide area. From the south a group of Federation officials included FBAS chairman Mr F. Tomkins and Mrs Tomkins, Mrs Sybil Hedges, Mr Tom Glass and Mr and Mrs Derek Lambourne.

Six excellent lectures included a look at the beginnings of it all with a talk on 'Fossil Fish' by Miss Turner of the Newcastle Museum, a talk on fish diseases by Mr Richards of the Aquatic Pathobiology Unit of Stirling University, which elicited a vigorous question and answer session

for the lecturer, and the lecture by the leading authority on the Kilt Valley Cichlids, Dr. Ethelwyn Treweek of the British Museum. As a memento, each lecturer was presented with an individual plaque of a fish appropriate to their interests, made of beaten copper and brass.

The Tyne-Tees Area Association received the congratulations of all present for providing aquarists with such a worthwhile occasion, and hopes were expressed that its success would enable it to become an annual event.

of these fish and then answered members' questions.

Recent table show results have been: Male guppies: 1, Mr K. Bladder; 2, Mr M. Nixey; 3, Mr A. Billington. Female guppies: 1, Mr A. Billington; 2 & 3, Mr D. Mullen. Aquascaping: Mr D. Mullen. Over 40 fishes were entered for the March table show. Tropical catfish: 1, Mr B. Dalley; 2, Mrs E. Hart; 3, Mr D. Mullen. Corydoras: 1 & 2, Mrs P. Carter; 3, Mr J. Finney. Sharks: 1, Mrs Mackie; 2, Kevin Abraham; 3, Mrs Dalley & Mr A. Worth.

AT a recent meeting of **NEW FOREST AS**, a request from the League of Friends of the local Millard Hospital was reported for assistance in erecting and maintaining an aquarium in the Day Room, and two members quickly offered their services in this very worthy cause. A training scheme for potential judges has also been announced and in order that practical experience may be gained, those taking the training will be invited in turn to judge the monthly table show. The judges of the Home Furnished Aquaria competition, Mr J. Jefferies, had some very interesting comments to make on the various tanks. A colour slide and tape lecture by Mr P. Ginger on baths, operated by Mr T. Danby, proved very interesting to members as the slides were of good quality and the tape most informative. Table show class winners have been: a.s. tropical, Mr A. Williamson; danios & minnows, Mr B. Higginson; rasboras, Mr A. Burns; cichlids, Mr J. Jefferies. The winners of the Home Furnished Aquaria competition were: tropical: 1, Mr A. Williamson; 2, Mr R. Travers; 3, Mr D. Harding. Coldwater: 1 & 2, Mr D. Harding.

BRACKNELL AS have been participating in a variety of activities. Members have enjoyed a talk and slide show on breeding coldwater fish by Mr R. Eison, a discussion on judging led by two club members, Mr L. Jordan and Mr T. Duffy, and a slide quiz organised by Mr Duffy that was won by Mr R. Norris. Mr Norris's successes have also included winning the specialist and senior classes at two recent table shows. Mr L. Little has twice won the senior and once the specialist class at the last three table shows.

FEDERATION



NEWS

Analysis of Returns from the Open Shows of Last Season

THE Federation's Show Fish Size Sheets have now been completed by the Judges and Standards Committee and will come into full use this year. The sheets are available to all aquarists at a cost of 15p per set, or four complete sets for 50p. The sets are as follows: Set Dc (Classes Dc, H, E, L, K); Set M (Classes M, Ca, J, T, W); Set G (Classes G, Ca, Ba, Cb); Set P (Classes P, D, O-S, Bz, Db). Sheets can be obtained from the Publications Secretary, Mrs Sybil Hedges, 150 Ashburton Avenue, Seven Kings, Ilford, Essex.

The annual review of the previous year's shows made by the Federation chairman, Mr Frank Tomkins, has just appeared in the Federation's Bulletin. These very interesting statistics were compiled from returns made at 29 open shows with a total entry of 11,788 fishes (averaging 400 per show). Regarding the Quality Evaluation table Mr Tomkins reports: 'It is heartening to see that more Classes climbed above the average line (5 points out of 10), but the cultured species (livebearers and angels and fighters) are still below par. Whilst the Corydoras were still there in quantities, their quality deteriorated since their peak last year. Furnished Classes were paradoxically split with the larger (Club) entries being well below the standard of the individual Classes. Junior Classes (where held) were well above average, which augurs well for the future. The ratio of fish/show fell last year although the judges per show (5) still had around 100 fish to deliberate over, and each one was pointed!'

Forthcoming Championship Class Shows

11th May	Southern, Leigh & DAS	Cz	Characin
11th May	Peet Talbot AS	Xo-t	Breeders (livebearer)
26th May	Cochy & DAS	No-m	Pairs (egglayer)
2nd June	Sudbury AS	K	Danio & WCMM
8th June	Havant & DAS	Yb	Coldwater marines
8th June	Llantwit Major	Q	Swordtail
9th June	Brighton & Southern AS	G	Tropical catfish
16th June	Salisbury & DAS	Da	Angels
23rd June	Taunton & DAS	O	a.v. Male guppy
29th June	Danzon & DAS	No-t	Pairs (livebearer)
6th July	Basingstoke AS	Db	Dwarf cichlids
4th August	Tonbridge & DAS	T	a.o.s. Livebearer
1st September	Newbury & DAS	R	Platy
1st September	Bethnal Green AS	W	a.o.s. Coldwater
1st September	Wellingborough AS	U	Singletailed goldfish
8th September	Harlow AS	P	Guppy female
14th September	Bracknell AS	Ba	Barb
14th September	Hounslow & DAS	V	Twintail goldfish
5th October	East London A & PA	Z	Plants
5th or 6th October	Hampstead & DAS	S	Mollies
22nd October	North Kent AS	F	Egg-laying toothcarps
10th November	Walthamstow & DAS	Xu-w	Breeders (coldwater)

In Brief . . .

... **THE GATFISH ASSOCIATION OF GREAT BRITAIN** is holding its next meeting on 13th May at St Saviours Church Hall, Cobbold Road, London, W12 (A-Z reference, p.58 3A). Prospective members welcome. Meeting starts at 8.00 p.m., refreshments available.

... 'MORE difficult than judging tropicals' was the verdict of **BOURNEMOUTH AS** after a talk on coldwater fish judging by Mr B. Coombs, who explained in detail the more complicated method of pointing that was used for coldwater species. Mr Chardfield won in the characin and av tropical pairs classes and Mr B. Coombs in the common goldfish and shubunkins classes of the table show.

... AN informative and enjoyable talk by Mr Porter gave members of **SUFFOLK A & PA** a clear idea of the means by which a fish can be brought up to show standard and how fishes are benchted. The Society have also enjoyed a tape lecture on Siamese fighting fish.

... **PLANTS** were the subject of an interesting and informative talk with slides given by Mr B. Pye to members of **NEWBURY & DAS** in February. The Society now meets at The Liberal Hall, Bartholomew Street, Newbury, on the third Tuesday of each month.

... **THE** three new trophies to be contested in table shows at **AIREBOROUGH & DAS** were won as follows: Advanced trophy, Mr & Mrs Birdall (ticto barb, Best in Show); Junior trophy, Master C. Jackson; Novice trophy, Mr R. Jackson. The Home Furnished Aquaria Competition was won by a junior member, Master M. Benson, with another junior, Master C. Jackson, second.

... **THE** Committee of the **GOLD-FISH SOCIETY OF GREAT BRITAIN** have decided that in future only breeders classes will be held at the July quarterly meeting table show. This will be for all varieties bred during the previous year. The Show Secretary reports: 'The only class to be held at the A.G.M. will therefore be for "The Most Attractive Fish by Popular Acclaim", which competes annually for the Rose Bowl. This class is open to any adult fish of any variety

that its owner considers to be "good to look at"—in other words, this is our annual beauty competition!'

... **IN** their first table show of the year **BARRY AS** got off to a good start: 1 & 3, Mr M. C. Guthrie; 2, Mr K. Thomas. The evening's entertainment was completed by the judge Mr D. Warneant giving a slide show, on barbs and techniques of breeding this popular egg-layer.

... **AT** the end of the eleventh table show of the **BIRMINGHAM SECTION FANCY GUPPY ASSOCIATION** of the Cup Points trophy positions were: Mr D. Phillimore, 204; A. C. & I. Truman, 186; Mr G. Steadman, 156; Mr M. H. Delingspole, 151; Mr R. Jones, 136; Mr K. Lee, 118; Mrs J. Croft, 82; Mr R. Francis, 43. All visitors are welcome to the meetings on 4th Sunday afternoon of the month at the Glebe Farm Community Centre, Stochford, Birmingham, and anyone interested in the guppy hobby and who wishes to learn more about the genetics of this fascinating tropical fish should contact the show secretary, Mr G. Beacham, 35 Frankton Close, Matchborough, Redditch.

... **BRIGHTON & SOUTHERN AS** members, both old and new, enjoyed seeing a slide/tape lecture produced by the Society some years ago. As it was on general fishkeeping, newer fishkeepers found it helpful and members of longer standing enjoyed being reminded of what fishkeeping used to be like a few years ago. Mr P. Coetle, FBAS, judged the table show for cichlids and awarded Mr Ben Savers his 'first' first award.

THE beaten bronze and copper plaques presented by the Tyni-Ten Area Association to the lecturers at their recent Convention, which were greatly admired, were executed by Mr A. Foster, an artist and craftsman who is also an aquarist. Mr Foster can undertake commissions of individual fishes (Caesar, of Aquarium Show fame, has been perpetually recorded in life-size by Mr Foster). Enquiries should be addressed to Mr Foster at 66 Otzen Drive, West Boldon, Co. Durham; a good line drawing is required to work from for specific pet fishes. A first-class photograph might be acceptable but it must be very detailed and clear.

... **PORTSMOUTH AS** are to hold their annual Inter-Club Show on 26th May, at Portsmouth Community Centre; judges are from the FBAS panel. Information will be sent to Societies in the south as soon as it is printed. There is to be entertainment at the hall for those not wishing to spend a few hours on Southsea beach.

... **LEAMINGTON & DAS** were able to forget the disappointment felt when a film showing had to be postponed (on its being discovered that the cost of the projector would be £16 per hour), because of the excellent entertainment provided at short notice by Mr T. Dobson, aided by Mr D. Hawkins, showing a slide show of Mr Dobson's own fish kept throughout the year.

... **SHOW** Secretary of **BRADFORD & DAS**, Mr J. Brown, has presented the Society with two new trophies, one for points gained for breeding difficult fish and one to be awarded for most entries at open shows. The Society has announced the date of its Open Show (17th November) very early this year so that members and visitors can prepare fish for it well in advance. Recently the Society has enjoyed one of Mr H. Foden's knowledgeable talks where he leaves the audience to pick their own subject and dispenses a vast amount of information in answering their questions.

... A **NEW** scheme of **DORCHESTER & DAS**, to allow junior members to take a more active part in the Society by having a junior-only table show once every 3 months, proved to be a success when the inauguration show was held. Results were: Platys: 1, Mr R. Cook; 2, Mr D. Payne; 3, Mr K. Fox. Molliguppies: 1, Mr R. Cook; 2, Mr R. Christopher. The main event of the evening was the slide show presented by chairman Mr H. Cornick, showing the social events enjoyed by the Society in the previous year.

... **FOLLOWING** the encouraging support received at their Tropical Fish Exhibition last year, **GREAT YARMOUTH & DAS** have formed a special committee to organise a 2-day event in August this year (see Dates for Your Diary). The exhibition will be organised on similar lines to last year with tropicals, marines, coldwater and other exhibits of interest to the aquarist. An annual trophy is awarded for

the best furnished aquaria, but in the other sections the exhibition will be run purely on a non-competitive basis to promote the hobby in the area and encourage new members to join.

FISH disease was the topic of the talk given at the March meeting of the ASSOCIATION OF GOLD-FISH BREEDERS. Table show results, judged by Mr I. Flemming, were: Dorsal-less: 1, Mr L. Clements; 209 Young fish: 1, Mr H. Benca; 2, Mr L. Clements; 3, Mr D. Nutt.

CROYDON AS are not holding an Open Show in 1974. All winners of trophies are asked to return them to Mr M. Cook, 7 Knapsdale Close, Elton Bank, Forest Hill, London, SE24. The Society thanks all aquarists for support given at past shows.

NORTHWICH & DAS welcomed members of the newly formed Winsford Vale Royal AS to their March meeting. Mr L. Thorne winner of the Individual Furnished Aquarium Tropical class at the '73 BAF and of the Society Furnished Tropical class at the '72 BAF was the speaker and described how to set up a furnished tropical aquarium for exhibition or home display. This was followed by a slide show, presented by Mr H. Buckley, of furnished aquaria seen at BAF for the last 4 years. Mr J. Buckley judged the table show classes and awarded first places in the killifish and barbs under 3 in. classes to Mr T. Siochane. Barbs over 3 in. was won by Mr B. Connelly. The Breeders Award Scheme section was won by Mr P. Wrench with red sword.

WHEN Mr E. Stokes lectured to the CHESHIRE & NORTH WALES GROUP of the BMAA in aquascaping he was heard with great interest and attention since it was Mr Stokes who aquascaped the tanks for the group for the marine section which took 1st, 2nd and 3rd prizes at the 1973 BAF. General discussions also took place on the Fluorocarbonyl which was the Fish of the Month.

THE ELY & DAS Tropical Fish Exhibition about which Mrs L. Porter wrote in our last issue (see Letters, 1936, April) is being held at Bedford House, St Marys Street, Ely on 28th July. It will be open to the public from 10.00 a.m. to 6.30 p.m. Details are available from

Mr S. Porter, 54 Cambridge Road, Stretham, Ely, Cambs.

A SIMPLE way of cleaning out a show jar efficiently was but one of the very useful hints that SOUTHAMPTON AS members gleaned from a talk by Mr Colin Beets on gadgets for the aquarist.

NOW that the Mulfand Aquarist League Inter-Club shows have started (eight clubs participate in four shows held between March and

October each year), COVENTRY P & AS have great hopes of victory after finishing second for the last two years. The audience at a well-attended meeting in February enjoyed a talk by Mr R. Fox of Rosedale Aquatics, Earborge on the progression that led to the starting of his business (a goldfish won at a fair, 15 tanks in the sitting room, 66 tanks in the spare bedroom to finally, the commercial fish house).

Dates for Your Diary

3rd May, BOURNEMOUTH AS Open Show, Kingston Community Centre, Millham Lane, Kingston, Bournemouth.

5th May, OSRAM AS Open Show, Recreation Rooms, Regent Street, Shore, or Oldham, Lancs.

11th May, PORT TALBOT AS Open Show, Y.M.C.A. Buildings, Port Talbot, Details: Mr A. E. B. Postma, 1 Cross Street, Valence, Port Talbot, Glam. SA13 1AZ.

11th May, SOUTHEND, LEIGH & DAS Open Show, St Clements Hall, Leigh-on-Sea, Essex, Club and individual furnished, aquascapes and marine classes. Schedule: Mr D. Dainton, 172 Trinity Road, Southend-on-Sea, Essex: phone 410736.

12th May, GLOUCESTER AS Open Show, Education and Leisure Centre, Palmwick Road, Gloucester. Schedule: (February); Mr B. Walker, 41 Hales Road, Gloucester.

18th May, TROWBRIDGE & DA & PS Open Show, Nelson Haden Boys School, Trowbridge, Wilt. Schedule: Mr S. S. Huddle, 49 Marsh Road, Milserton, Trowbridge, Wilt.

19th May, BOSTON AS Open Show, Backfields, Boston, Schedule: Mr D. J. Carter, 38 Tooley Lane, Wrangby, Boston, Lincs: phone 0533 2477.

19th May, NEYBIL & DAS Open Show, School Hall, Matlock, Somerset, Schedule: Mr P. New, 3 Marfield Road, Yatton, Somerset: phone Yatton 24223.

19th May, MERSEYIDE AS Open Show, Royal Community Centre, Rainhill 1 lane, Schedule: Mr W. Smith, 94 Long Lane, Liverpool, L15 8HE.

24th May, BRITISH ICHTHYOLOGICAL SOCIETY AGM, County Hall, London, SE1, 7.00 p.m.

25th-26th May, FANCY GUPPY ASSOCIATION International Open Show, Gabe Fairs Community Centre, Gabe Fairs Road, Natchford, Birmingham, Details: Mr D. R. Beathan, 17 Pesham Close, Woodtree, South, Baddick, Wares, Lincolnshire (a.s. please).

25th-27th May, MID-SUSSEX AS Fish Exhibition, The Park Centre, Burgess Hill, Sussex, Setting up 25th May. Open to public, 26th-27th May. A day out for the family - entertainments include the famous Crab Derby.

26th May, BRIDLINGTON & DAS first Open Show, Alexandra Hotel, Bridlington, E. Yorks. Schedule: Mr J. Lee, 91 Carrington Road, Bridlington, E. Yorks: phone 6799.

26th May, LOYNE AQUARISTS Open Show, St Pauls Parish Hall, Lancaster. Schedule: Mrs H. Bitchler, 32 Lythell Avenue, Hutton-on-Lune, Lancaster: phone Hutton-on-Lune 623.

26th May, HALF MOON AS 3rd Open Show, Corporation Hall, Stockton, Teeside. Details: Mr P. McGee, 21 Allington Drive, High Green, Birmingham, Teeside, or Mrs W. Willis, 100 Darlington Lane, Norton, Teeside.

26th May, CORRY & DAS Open Show, Corby Civic Centre, Schedule: Mr A. Shaw, 176 King Street, Kettering, Northants.

27th May, Evening Bank, Holdfast, EXHIBITION OF FISH AND REPTILES, Tiffin School Fair, Queen Elizabeth Road, Kingston, Surrey, 2.00-7.00 p.m.

1st June, FBAS ASSEMBLY, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

1st June, GSGB General Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

2nd June, BRITISH CICHLID ASSOCIATION (Northern Area), Show for schools only. Further details to follow.

2nd June, LOUGHBOROUGH & DAS Open Show, Schedule: Mr L. Parry, 10 Cleveland Road, Loughborough. Lincs. LE11 2NF (phone Loughborough 6171).

2nd June, SUDBURY AS Open Show, St Andrews Hall, Southey, Warrsley, Middlesex. Details: Mr L. Brazier, 56 Ormsby Way, Kewton, Middlesex: (phone 91-204 5334).

2nd June, CHEAMBLEY AS Open Show, Town Hall, Colston, Birmingham. Schedule: Mr J. Cox (phone 021-742 1430).

6th June, LLANWIT-MAJOR AS 21st Anniversary Open Show, The Town Hall, Llanwrtyd Major, Suggest contributions towards for all classes. Schedule: Mr J. J. Edwards, Glanville, Mill Park, Llanwrtyd Major, Carmarthenshire, CF77 7BE.

6th June, HAVANT & DAN 4th Open Show, St George's Hall, Waterbury, Schedule: Mr V. B. Hunt, Caiglas, 120 London Road, Woking, or Portsmouth, Hants, PO7 7JW.

6th June, BISHOPS CLEEVE AS Open Show, TA Centre, Acton Road, Chalfont, Glos. Schedule: Mrs D. Ross, 22 Selborne Road, Bishop Cleeve, Cheltenham.

6th June, GRN POND & AQUARIST SOCIETY Open Show, Details: Mr K. S. Hall, 78 Richard Street, Darlington, Staffs. SD10 8AL.

6th June, BRIGHTON & SOUTHERN AS Open Show & Fishkeeping Exhibition, St Barnabas Church Hall, Sackville Road, Hove. Details: Mr S. Lusk, 35 Newmarket Road, Brighton: phone 652037.

6th June, MIDDLETOWN & DAS Open Show, Hutton High School, Hutton Lane, Middleton. Details: Mr K. Smith, 49 Marfield Street, Manchester M9 1BA. Please note: members of recognised aquarist society only may exhibit.

9th June, NORTHWICH & DAS 6th Open Show, Hatfield Secondary Boys School, Charter Road, Hatfield, Northwicks. Details: Mr N. R. Thompson, 54 Gwentway Road, Frodsham, via Warrington, Lancs. WA5 7JQ: phone Frodsham 3745.

10th June, SALISBURY & DAS Open Show, City Hall, Salisbury. Details: Mr I. Goddard, 190 Croydon Way, Salisbury, Wilt.: phone 27433.

16th June. **BILLINGHAM** AS Open Show. Billingham Community Centre. Schedule later.

16th June. **SWILLINGTON** AS Open Show. John Soman School, Barwick Road, Swillington, Leeds.

16th June. **SALISBURY & DAS** Open Show. The City Hall, Fisherton Street, Salisbury. Details to follow.

21st June. **ALFRETON & DAS** Open Show. Adult Education Centre, Alfretton Hall, Alfretton. Details: Mr B. Hickling, Parkview, 11 Cooper Drive, Eastwood, Nottingham; phone Langley Mill 5104.

23rd June. **MOUTH SHIELDS** AS Open Show. Bellinghouse Hall. Details: Mr W. Scott, 87 Lincoln Road, South Shields, Co. Durham.

29th June. **NAIASEA & DAS** 1st Open Show. Details: Mrs F. Gange, 31 Donnan Gardens, Naitang, New Zealand.

30th June. **HIGH WYCOMBE** AS Open Show. Lane End Hall, High Wycombe, Bucks. Details: Mr R. Leyla, 29 Meadow Walk, Tyler's Green, Bucks. HP30 5DG; phone Peter 4186.

30th June. **LINGOLN & DAS** Open Show. Venue to be announced. Details: Mr S. Hill, 14 Hartley Street, Lincoln.

6th July. **BASINGSTOKE & DAS** Open Show. Carnival Hall, Basingstoke, Hants. Details: Mr B. Rich, 63 Pinkerton Road, Basingstoke, Hants.

21st July. **THE SANDGROUNDERS' AS** Open Show. Marsh Coy Secondary School, Southampton. Details: Mr T. Tasker, 44 Kemington Road, Southampton.

27th July. **GNGB General Meeting**. Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

28th July. **ELY & DAS** Tropical Fish Exhibition. Bedford House, St. Mary's Street, Ely. Open 10-4. Details: Mr S. Payne, 54 Cambridge Road, Newmarket, Ely, Cambs.

28th July. **AREBOROUGH & DAS** Open Show. Methodist Community Centre, Main Street, Merton. Details: Mr W. Clark, 20 New Street, Slough. Tel. 0753 425 711; phone: Paderby 2466.

4th August. **TONBRIDGE & DAS** Open Show. Details: Mr E. T. Mathison, 31 Norton Way, Five Oak Green, Tonbridge, Kent.

16th August. **NEWPORT** AS Open Show. St. John's Hall, Victoria Avenue, Mansley, Newport, Mon. Details: Mr W. Gibbon, 65 Dunstable Road, Newport, Mon.; phone 74101.

11th August. **GREMSBY & CLEETHORPES** AS 3rd Open Show. Memorial Hall, Cleethorpes. Schedule later.

17th August. **ANSON AQUATIC CLUB** Open Show. Kings Hall Community Association, 152 Harlowden Road, Willesden, London, NW10.

18th August. **BEDWORTH AQUARIUM & POOL SOCIETY** Open Show. Nicholas Chamberlain School, Bellington Lane, Bedworth. Schedule: Mr J. Salisbury, 242 Gadsby Street, Nuneaton.

18th August. **STROUD & DAS** Open Show. Stroud Subaquatic Society. Details: Mr D. Cole, Avignon, The Hill, Radstock, Stroud, Glos.

18th August. **Huddersfield TFS** Open Show. Paddock Youth Centre, Busch Street, Huddersfield. Details: Mr H. Atterton, 31 Watkinson, Deighton; phone Huddersfield 37997.

25th August. **CASTLEFORD** AS Open Show. Castleford Civic Centre.

25th-26th August. **GT YARMOUTH & DAS** Tropical Fish Exhibition. Youth & Adult Centre, St. Nicholas Road, Great Yarmouth. Tropicals, insects, coldwater, freshwater aquaria, trade stands. Details: Mr F. Watson, Pyram, 31 Common Road, Hensby, Great Yarmouth, Norfolk.

31st August. **WESTON-SUPER-MARE & D TFC** Open Show. St John's House, Oxford Street, Weston-super-Mare.

1st September. **NEWBURY & DAS** 2nd Open Show. The Piano, Market Place, Newbury, Berks. Subdivided: Mr G. Foster, 19 Jubilee Road, Newbury, Berks.

1st September. **BETHNAL GREEN** AS Open Show. The Institute, 228 Bethnal Green Road, London E2. Schedule: Mrs S. Halden, Kate Cottage, 130 Ashburton Avenue, Hildon, Essex.

1st September. **PETERLEE & DAS** Open Show. Schedule: Mr Bellingham, 40 Millborough Road, Hastings Hill, Sunderland, Co. Durham.

7th September. **FRAS ASSEMBLY**. Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

8th September. **BRACKNELL, DUDCOT & READING** AS Combined Open Show. Students Union, Reading University. Details: Mr J. Harvey, 4 Rickman Close, Woodley, Reading, Berks. RG5 911; phone: Reading 668017.

8th September. **CLEVELAND** AS Open Show. Details: Mr B. Wellford, 1 Railway Terrace, North Skelton, Saltburn, Yorks.

8th September. **HARLOW** AS Open Show. Moor Hall, The Moor, Harlow.

8th September. **SLUIGH & DAS** Invitation Show. The Rotunda Club.

14th September. **HOUNSLOW & DAS** Open Show. Youth Centre, Cecil Road, Hounslow, venue to be confirmed. Details: Mr H. Pratt, 23 Woodlawn Drive, Feltham Middlesex; phone 01-894 9923.

15th September. **NELSON** AS Open Show. Civic Centre, Stanley Street, Nelson, Lancs. Details: Mr H. Strongworth, 34 Barrowford Road, Colne, Lancs.

22nd September. **HASTINGS & ST LEONARDS** AS Open Show. Details to follow.

22nd September. **TORRBY** AS Open Show. Torquay Town Hall.

26th September. **HUCKNALL & BELLWELL** AS Open Show. Details to follow.

26th September. **CHENTFIELD & DAS** Open Show. Clay Cross Social Centre, Chentfield Road, Clay Cross, Chesterfield, Derbyshire. Details: Mr P. Minton, 79 Salisbury Crescent, Newbold, Chesterfield.

3rd October. **HAMPSTEAD & DAS** Open Show. Blackheath Hall, The Priory, Southamptons Road, London NW5. Details: Mr T. Woolley, 20 Copsons Close, N. Finchley; phone 01-464 4876.

5th October. **CARDIFF** AS Open Show. St. Margaret's Church Hall, Roath, Cardiff. Details: Mr C. Turner, 140 Avon Road, Roath, Cardiff.

5th October. **EAST LONDON A & F's** Open Show. Ripple Road School, Ripple Road, Barkley, Essex. Details: Mrs J. Arvon, 43 Church Street, Dagenham, Essex.

24th-27th October. **THE AQUARIUM SHOW '74** at the Royal Horticultural Society's Old Hall, Victoria Square, London SW1. Presented by the Federation of British Aquatic Societies. Aquarists society following exhibits invited. Details from the organisers: Box, 554 Garratt Lane, London SW17 0NX; 01-947 2809.

26th-27th October. **THE IRISH TROPICAL FISH SOCIETY** 3rd Open Show. The Mission House, Dawson Street, Dublin 2. Schedule: Mr J. P. Naiman, Kilgobbin, Sandymount, Co. Dublin.

27th October. **DONCASTER & DAS** Open Show. Bradworth House, Wilton, Walford Road, Woodlands.

2nd November. **GNGB General Meeting**. Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

10th November. **HALIFAX** AS Open Show. The Forum, Cottage Community Centre, Cousins Lane, Stonegrave, Halifax. Details: Mr D. Bostels, Collyerston, Garside, Kings Cross, Halifax; phone Halifax 60111.

10th November. **WALTHAMSTOW & DAS** Open Show. Details to follow.

17th November. **BRADFORD & DAS** 27th Open Show. East Bowling Unity Club, Levensham Street, Wakefield Road, Bradford. Details: Mr E. J. Brown, 8 Garden Field, Wye, Bradford; phone Bradford 617175.

1st December. **HIGHBORNE** AS Open Show. New Civic Hall, Starsongley Road, Paderby.

7th December. **FRAS ASSEMBLY**. Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

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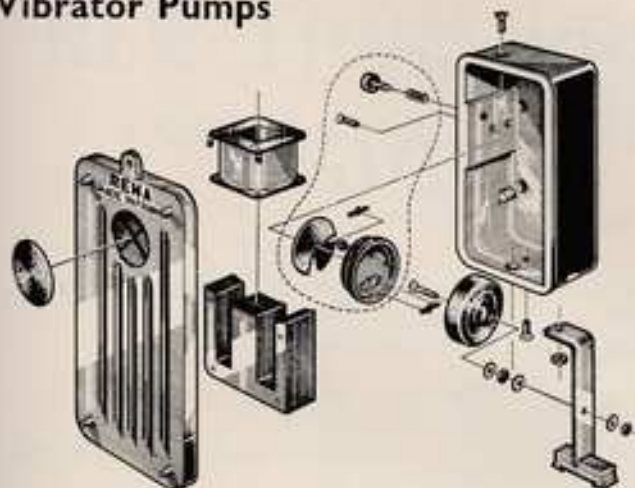
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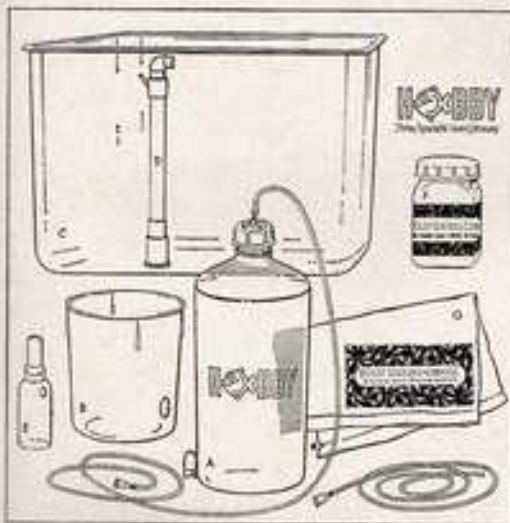
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