

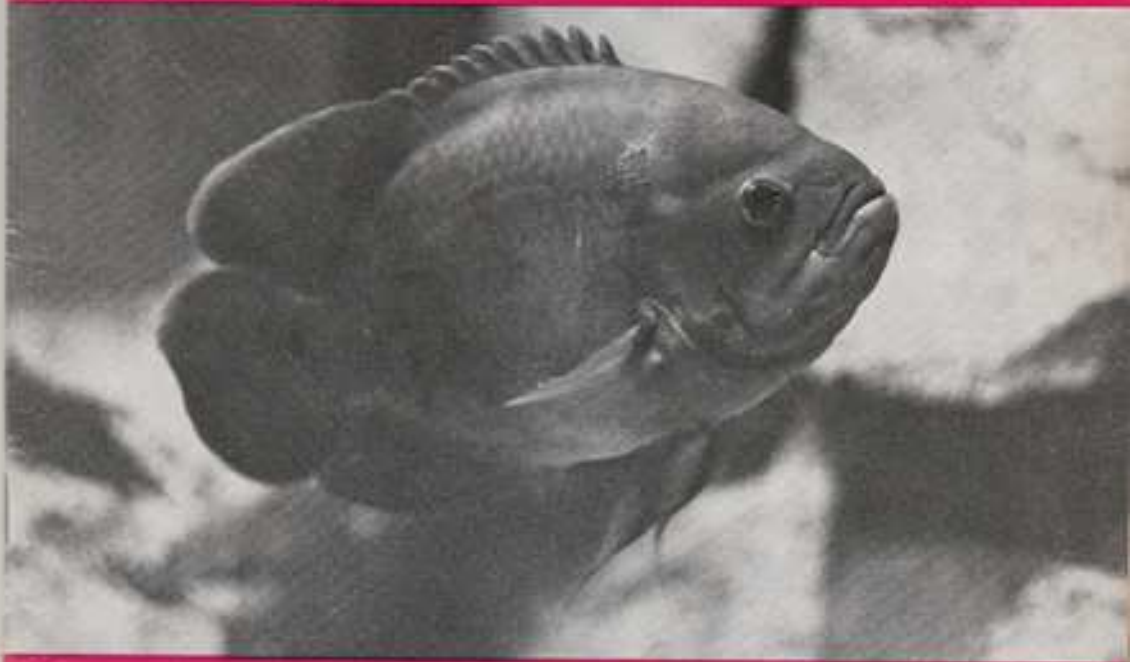
MAY 1973

20p

Pet Fish

monthly

The PRACTICAL FISHKEEPING MAGAZINE



Contents include:

A Spawning of Oscars

Native Marinees

Neon Tetra Disease

Venom on the Coral Reef

Making All-Glass Equipment

Breeding the Convict Cichlid

The Slender Rasbora

AquaGlossary etc.

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Comments and Quotes

- Programmes of aquatic interest on television
- Introduction of VAT

T.V. Aquatics

THE British scientific journal NATURE has recently been giving the BBC some hard knocks over the presentation of science on television. Some of the criticised programmes were ones that could have been of interest to aquarists, and it is sad in view of the rather limited programme time that our interests generally receive, that these items should have been open to attack.

The charge put by NATURE is that 'Television is feeding the public the primitive idea that Nature is random and capricious. It is doing this particularly in children's programmes'. The programme for youngsters called *Illus Peter* has been conspicuously lazy in its approach to science. Among other faults found in this programme by NATURE was the fact that it had 'discussed tropical fish from the point of view of their ability to harm man. Some fish sting, some bit and others (sharks) could chew people all to bits. The fact that these natural defences were of some advantage to the fish was not discussed'.

A 'Horizon' programme 'Science is Dead—Long Live Science', says NATURE, 'contained an over-sympathetic account of a commune of young scientists who rejoice in the name "New Alchemists" who, among other things spend their time 'cultivating fish in tanks surmounted by greenhouses made with plastic strung across a geodesic dome... Quite apart from the maddled explanation of their activities which the members of the commune provided the simple ecology of a fish tank was held to be incapable of objective analysis...'

On the credit side, a recent 'Horizon' programme that must have delighted any aquarist who saw it was the prize-winning 'Making of a Natural History Film'. Here the value of the spines of the stickleback to the fish in cutting short its

stay inside the jaws of a voracious pike was clearly demonstrated (as was also the stickleback's apparent inability to get the message that the pike was not seeking to form an enduring friendship—perhaps this was the effect of aquarium conditions and bright photographic lights, however!).

Another BBC programme entirely praiseworthy showed the activities of a research team of zoologists studying the crown of thorns starfish on a coral reef. What must be the most successful way of all for keeping tropical marines (given a few rather special circumstances!) was demonstrated by a puffer fish kept in a large mesh cage anchored to the sea bottom—other puffers actually appeared to want to join the captive as they viewed him ripping up crown of thorns starfish provided for him inside his cell.

Programmes that set out to both entertain and inform are probably always easy targets of criticism, so much depending on the director's personal judgement of where the relative emphasis is placed. As far as programmes of potential aquatic interest are concerned, we certainly hope that adverse comments will not stop the underwater cameras rolling in the future.

Aq-VATic Confusion

A NOTE of sympathy for aquatic traders coping with the introduction of VAT. There was quite a bit of confusion in the trade last month over application of the tax to various aquatic lines, and wholesalers appeared generally to be unable to supply all the answers. There certainly appears to have been a dearth of informed advice of the specialised kind required by the pet trade on this tax, and during the settling-down period retailers in particular should have the understanding of their customers we think.



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

Tropical Anemone

IT is many years since I put pen to paper regarding comments made on the hobby side of aquatics, but I feel that something must be made clear to people contemplating the keeping of marines. I make reference to the article 'Tropical Anemones' by Roy Pinks (PFM, March). The majority of tropical anemones offered by the trade are by far the least difficult of all marine life to maintain. They are beautiful, exotic and easy to feed.

Anemone fish do not take to all the offered hosts readily and different species of fishes prefer different species of anemone, with a higher preference for the darker coloured. I have had the pleasure in helping a large number of hobbyists on to the marine trail—even complete novices who have never kept fish before, and to all I have, and can, recommend the anemone as the first inmate of the marine system.

As to the use of copper in marine (or freshwater) aquaria, there are substitutes, and, like all chemicals, if the dose is overstated to a degree it can become fatal to all forms of aquatic life. Unfortunately, I feel from my experience that a higher percentage of fish have actually been killed through chemical treatment than have ever been cured.

Your anemone should be fed on small chunks of shrimp, crab, mussel, meat, fish, worm etc., pushed through the anemone's 'mouth' to the stomach once or twice a week.

Newcastle upon Tyne 1

LEN MCCOURT

Midland Show

AT a recent Committee meeting, the future of our annual Open Show was discussed and it was decided that we should once again stage the Show, at our usual venue, Bingley Hall. This decision was not taken lightly. Because of last year's financial set-back, some members were in favour of discontinuing the Show; however, other members took the view that we should endeavour to keep the Show going since it is the only Show of its kind in the Midlands.

The show is of 4 days' duration, with something in the order of 600-700 entries being benched in some 60 classes—21 coldwater classes, 30 standard tropical classes, decorative classes, marine classes, reptiles, amphibians, venomous snakes, society stands and trade stands. Awards include £30 for

the Society obtaining the most points. There are cash awards for decorative classes and society stands, with 31 separate cups, award cards, etc.

The Midland Show is open to the public for 4 days from Wednesday 15th August to Saturday 18th August. It is staged by the Midland Aquarium and Pool Society. We ask aquarists to support us by visiting the exhibition during the above dates, so helping us to continue to stage this type of exhibition in the Midlands.

C. W. DAVIES

Secretary, Midland Aquarium & Pool Society

Calling Sunderland

I HAVE been interested in tropical fishkeeping for nearly 2 years, and I would like to contact any young hobbyists like myself to exchange information. As there is no society now in Sunderland (the old one broke up about a year ago) I do not know a lot of junior hobbyists. If any adult hobbyists reading this are interested in re-forming Sunderland Aquatic Society, I am sure they would receive support from many local aquarists.

13 Wingrove Avenue, ROSSIE SNAITH (aged 15)
Fulwell, Sunderland, SR6 9HT

Fish House Pump

IN recent months there has been quite a lot written in PFM about air pumps, about not being able to obtain spare parts and about dealers not bothering to hold stocks. So I thought I would look for a British pump suitable for a fish house. I found a firm (Lacy-Hulbert & Co. Ltd., Croydon, Surrey) who make only air pumps and compressors. The pump recommended was a non-lubricated carbon fibre rotary air pump, RB1201, cost £27, speed 2850 r.p.m., ¼ h.p. motor, air pressure 15 lb/in² and 2½ ft³/min. The motor is not that quiet. The air is filtered on both inlet and outlet. Spares are sent by return; they were a very helpful firm in every way.

I run my air line round the top of my fish house in ½ in. Osma plastic pipe, drill a ¼ in. hole where air is needed and push in a Nuova air valve (15p

Continued on page 11

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LETTERS

continued from page 2

each). The motor is on a time-clock so the tanks are filtered 4 hours out of 24 hours in two 2-hour periods. This seems to give best results for fish and plants. The only maintenance I have to do is to check the carbon fibre vanes every 3 months for wear and clean air filters of dust. It has been running for 1 year now; new vanes will be needed at the next servicing.

Northolt, Middx.

J. PARKER

Death of a Tuxedo

I THOUGHT perhaps you would like to include this in your Letters page. My neighbour looks after my fish when I go away and on my return I found this poem on the table:

Tuxedo sword gave up the ghost
And then laid down and died.
So raising it from the bottom tank
I planted her outside.
In rocky corner she reposes
Why she died, no one knows.
Wilky

I thought it very funny, and it certainly lessened the blow.

Woodside, London, S.E.25

D. T. SMITH

Venom on the Coral Reef

ACCORDING to Dr Harold Cogger, 37, head of the Department of Herpetology at the Australian Museum, Sydney, the most deadly Australian snake—and in fact the deadliest in the world—is a sea snake that abounds around Ashmore Reef in the Timor Sea, 220 kilometres (200 miles) northwest of Darwin, Northern Territory.

Venom from a number of species

was assayed in live mice'. Dr Cogger reported on his return to Sydney recently. 'From those tests it appears that the sea snake in question, *Hydrophis belcheri*, has a venom 100 times as effective as that of the taipan.'

The taipan, long considered to be Australia's deadliest reptile—it can reach a length of more than three metres (10 ft), delivers venom with

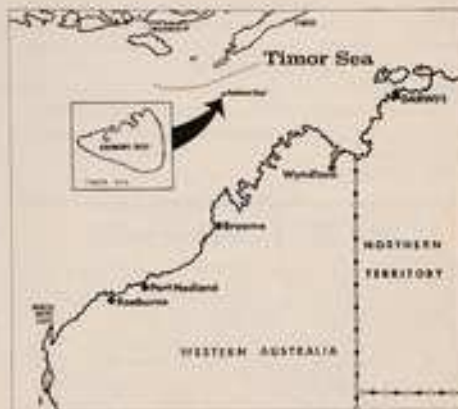
fangs that are up to 12 mm (½ in.) long, and has been known to kill a horse in 2 minutes—has thus lost its title to the sea snake.

Dr Cogger was one of three scientists from Australia in an 11-man specialist team led by Professor W. A. Dunson, Professor of Biology at Pennsylvania State University, U.S.A., and currently visiting Professor of Biology at James Cook University, Townsville, under a Queen's Fellowship grant.

Also with the expedition were Dr Noburo Tamura, head of the Department of Biochemistry at Tohoku University, Sendai, Japan, and seven scientists from the United States of America.

The 6-week expedition, whose principal aim was to collect and

Dr Cogger inspects five specimens of *Hydrophis belcheri* brought to his Sydney laboratory from Ashmore Reef



study sea snakes, cruised Indo-Pacific waters in the research vessel *Alpha Helix*, which is operated by the Scripps Institution of Oceanography. Specialists investigated such varied fields of study as venom, diving, feeding, behaviour and salt balance in these reptiles, which are essentially land snakes but which, through evolutionary processes, have developed adaptations that permit them to survive in a marine environment.

Some 450 snakes, representing 16 species, were captured by the expedition, most of them around Ashmore Reef, a coral and sand formation supporting three uninhabited islands less than 3 metres (8 ft.) above sea level, handed over to Australia by Britain in 1931.

'We collected nearly two-thirds of all known sea snake species', Dr Cogger said, 'including some that were thought to be quite rare.'

Another snake collected by the expedition which proved to be of particular interest came from freshwater Lake Taal, in the Philippines.

'It is the only known freshwater

snake, and has not been studied fully for 50 years or more', he said.

'It derives from a marine form, but still retains some of its adaptations for life in the sea, even though it no longer uses them'.

One of the features of Ashmore Reef that impressed Dr Cogger was the sheer abundance of sea snakes, both in terms of species and individuals: 'It was unbelievable—the reef is teeming with snakes. Fortunately they are not at all aggressive as far as humans are concerned, though there were several non-herpetologists among us who were uncomfortable at having venomous snakes writhing over their limbs during our daily dives.

'On the other hand, there were people, like myself, who have relatively little to do with sharks, who were uncomfortable at the sight of these fish swimming in the vicinity.

'We visited other reefs nearby, including Scott Reef and Hibernia Reef, and while there were certainly sea snakes there as well, there was nothing like the variety offered by

Ashmore.'

One of the reasons for the peaceful co-existence of so many different species at Ashmore, Dr Cogger believes, is that there is little food competition, each species tending to have its own exclusive food preferences. One species studied fed only on fish eggs, others fed on blenny, others only on the poisonous toad fish and still others only on coral eels.

'Ashmore is the only reef in the world with two endemic sea snake species', he said.

Sizes of the sea snakes observed and collected varied from more than 2 metres (7 ft.) to quite small forms. Among the specimens brought back by Dr Cogger to Sydney for further study was a brown snake, considered to be fairly rare, *Aipysurus fuscus*.

'The problems confronting a cold-blooded land animal taking up life in the sea are enormous', Dr Cogger said, 'but it is hoped that the findings of the *Alpha Helix* expedition will help us understand more about the ways in which sea snakes have adapted to this life.'

WHEN Mr and Mrs Roy Skipper announced in their advertisement recently that The House of Fishes was to change hands many readers thought it was another of the 'Guv'nor's' little jokes. But this was no leg-pull and Roy and Gwen have this month handed over to Mr Douglas Meldrum and his wife Pat. Mr and Mrs Meldrum (pictured on the right of the photograph taken with Roy and Gwen Skipper), originally from Scotland, have had over 20 years' experience in fishkeeping but have not hitherto been concerned with the trade. Breeding *ramirezi* has been Mr Meldrum's strong interest but he is not without experience of The House of Fishes speciality—the discus fish. Roy and Gwen are certainly not forsaking their interest in the aquatic world although their plans for the future are not yet finalised.



Mr R. J. Whitwell

IT is with great regret that we record the death of Mr R. J. Whitwell, which occurred suddenly on 2nd December last. Mr Whitwell became known as a highly successful breeder of angel fish, when these were still giving many aquarists great problems, soon after the end of World War 2. After completion of a police career, he founded a

fish-breeding and importers business at Colchester, conducted under his own name, through which he became widely known and universally liked and respected both in the aquatic trade and by the numerous aquarists who visited his fish houses. To Mrs T. Whitwell, his widow, who we understand is carrying on the business at Colchester, we extend our condolences in her sad loss, a loss which is shared by all in the aquatic world.

An Elegant Rasbora that is Easy to Breed and Rear



Rasbora daniconius

By RUDOLPH ZUKAL

THE slender rasbora is not a fish of dramatic appearance and is too inconspicuous to be found in everyone's tank, but it is nevertheless an elegant member of the Cyprinidae family. It is found all over the Ganges basin, in Burma, Thailand and the Greater Sunda islands. In the aquarium it will usually reach only about 3½ in. (8 cm.) in size, though in Nature it can reach the considerable length of 8 in. (20 cm.).

Photographs by the author

At first glance the fish resembles the much better known pearl danio and in fact this resemblance is noticeable not only in its appearance but also in its behaviour. Even its spawning behaviour is similar to though more peaceful than that of *Brachydanio albolineatus*. The slender rasbora has an elongated body, banded horizontally from the gills to the caudal peduncle. The belly is silvery white and the fins, which are without markings, are just faintly yellowish. The iris of the eye is a golden colour. The jaws are without barbels. Sex differences are not always easy to recognise even in the adult fish; one needs experience to recognise the sexes with certainty—it is simply a case of difference in body build, the female being the fuller in the belly, for the colouring of male and female is usually the same.

They are at home in the usual community tank conditions. A temperature of 72-77°F (22-25°C) is suitable with neutral to slightly acid water. My own rasboras were kept for several days in a tem-

Translated by F. MARSH



Differentiation of the sexes in *Rasbora daniconius* is by the slimmer body outlines of the male fish among mature specimens. In the photograph on the preceding page the upper fish is the male.



Photographs on this page show stages in the pre-spawning behaviour culminating in the deposition of eggs in the plants (photograph above)

perature below 62°F (17°C) with no ill-effects except that they showed no interest in feeding. Once the living conditions were adjusted and the water temperature was raised the fish soon got back to normal.

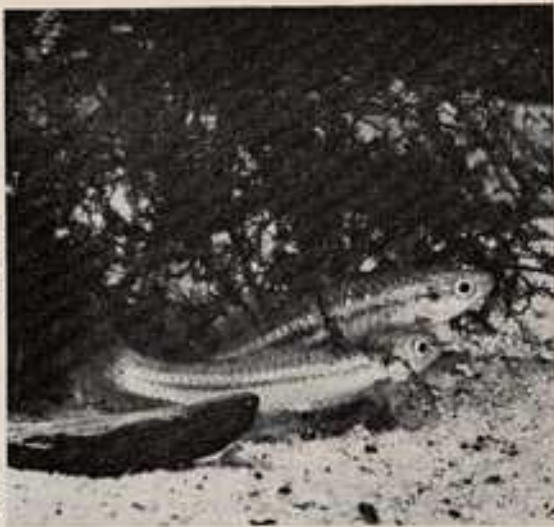
Ideally they should be kept in a shoal but they will soon lose their timidity in an ordinary community of other peaceful fishes of similar or slightly smaller size. For breeding purposes it is a good idea to separate the male from the female fish for 2 weeks beforehand—this increases the male's desire to breed. They are not fussy about food, though before spawning it is advisable to provide live daphnia and cyclops; but normally they do not require a particularly varied diet.

It is easy enough to breed this rasbora. I succeeded without difficulty and found them to be very prolific. I experimented with breeding them under various conditions. The fish spawn willingly in both a small and a large tank, at a temperature of 77°F (25°C) in neutral tapwater. As I have already mentioned, their spawning behaviour is similar to that of the pearl danio. My spawning photographs were taken at midday, after a short period of 'fore-play' (the female had been put in with the male in the early morning). Although the breeding process was not particularly stormy quite a lot of eggs remained unfertilised.

The newly hatched fry numbered about 200. They were fairly large and were fed with dust-

fine particles of food obtained by sieving fish food. The young grew very quickly and I was surprised to find that so regular was the growth it was unnecessary to sort the fish after 6 weeks. The youngsters like subdued lighting—in bright light they became restless. When they reach about $\frac{3}{8}$ in. (1 cm.) long, they can be fed with chopped tubifex. They will also take dried food quite happily.

Apart from the ease of maintenance and breeding of the slender rasbora, it is not particularly prone to disease; and so altogether I can recommend this fish to other fish-keepers with complete confidence.



In this picture taken during the spawning of a pair of *Rasbora daniconius* it can be seen that the male curls the caudal fin during mating but not to the extent of enfolding the female's body as seen with some other species.

MARINIST'S Notebook

I WAS so convinced by my notes about tropical anemones in the March PFM that I went out and bought one. But I mustn't rush things—it should first be stated how I came to be mixed up with the ways of these strange creatures so soon after having described a marine fish project, from the repercussions of which I am still only gradually recovering. It became clearly evident to me that if I were to continue to write about marine fishes from the viewpoint of the average beginner I should need to decide how many tanks I could manage within arm's reach, as well as how their contents should be organised.

Not wishing to relinquish any space allocated to my freshwater collection I had to confine my marines to three tanks—one of 35 gallons, one of 20 and one of about 15. The first contains the butterflies and similar showy specimens, the second houses the hardier species—damsels and the like, and the third is for clowns, anemones and plants, together with anything which might prove compatible with them. My rationale for this particular allocation is that the large tank, with its quite valuable contents, should be buffered against accidental introduction of disease at all costs, though it would not be practicable to maintain a quarantine tank as commonly visualised. The damsel tank, therefore, acts in this capacity, and I route through it all specimens intended for the main aquarium. As this middle capacity tank has been longest established it is theoretically full

By ROY PINKS

of the sort of adequately matured water which the butterflies demand, but the increasing size of some of the damsels admittedly increases, too, the prospects of bullying.

The third tank, set up shortly after Christmas, is an all-glass affair which I hurriedly put together to house some *Caulerpa* plants, which Graham Robertson kindly sent me to try out. In doing so he manoeuvred me into the position of having to justify this tank in more general terms, and right in the middle of what is the normal seasoning period for a marine tank I came upon a very passable rock anemone for just two pounds and I thought I ought to see how or whether it reacted to the very high amount of nitrites still present in the water. I have no idea what anemone this is—there are several thousand species—but it is pinkish-white, with purple-tipped tentacles—a type very frequently seen for sale these days.

The almost fanatical care which is advised for the transfer of anemones was exercised to the full. I insisted that it be not lifted out of the water in the shop tank and I gave it several hours of acclimatisation time. So that it might conceivably remain in the spot I chose for it I placed a flat shell beneath its foot, and it was not long before

it locked on to it. As a protection against heater burns I surrounded my Dial-o-Matic unit, which is suspended vertically in the water, by a circular sleeve made from a perforated plastic tank divider. I held out little real hope of seeing much more than a rather shapeless mass of jumbled jelly by the following morning, but to my surprise the creature was certainly alive. On switching on the Gro-lux lighting I was rewarded by an opening up of the tentacles, and it then seemed that my first anemone might just survive. I tested for nitrites during the next few days and the readings remained very high—the starter fish, incidentally, was a small

percula clown, which finally succumbed to the ordeal. The tank, of course, contained no traces of copper, since I had resolved that whatever else it might have decanted into it, all miracle cures would be rigorously excluded; any fish encountering or contracting disease would, as necessary, be transferred to the damsel tank for appropriate treatment.

Well, that anemone has survived now for 2 months and the tank is well past the completion of its initial seasoning, and the way seems reasonably clear for selective, considered additions of one sort or another.

Thriving Coral Reef in Bradford



Part of the living coral reef, with marine plants and tube worms as well as the polyps, under the care of Mr Gordon Holmes

FIRST established a year ago and believed to be one of only three in Britain, the reef on view in Bradford has now become a living community of 25 to 30 different species of coral polyps and formations living together and propagating themselves in exactly the way they are to be found in the Caribbean Sea and the seas of South East Asia.

Living on the reef are many forms of life; several species of coral and tube worms which have propagated, anemones and marine plants. For the enthusiast the star attraction is two living thorny oysters. Even the dead shell is a prized collector's piece.

Cultivated in a large aquarium in the shop of Keith Barraclough, Aquarist Ltd., of 568 Great Horton Road, Bradford, the reef teems with colour and life and is a fascinating, ever-altering picture.

The reef was created and is cared for by Mr Gordon Holmes, the Company's Technical Director and well-known in aquarist circles as a judge.

'We have tried to create a natural, living reef and have avoided introducing any artificiality', says Mr Holmes. 'We started with a vacated coral base and placed living corals upon it because this is how coral grows in Nature, to form the fantastic and beautiful shapes one enjoys in, for example, the excellent underwater programmes shown on television.'

The reef is on view to anyone who wishes to call at the shop and has already attracted visitors from as far afield as Scotland, London, the Isle of Wight and Ceylon.

AQUARIUM TECHNIQUES WITH GLASS—2

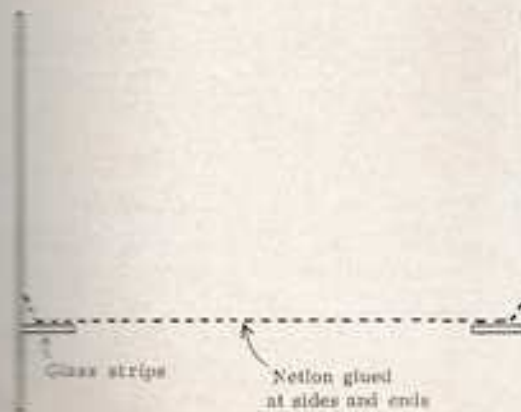
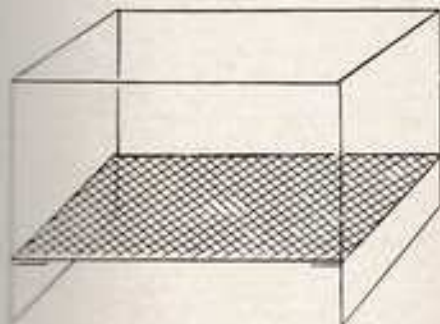
All-Glass Equipment to Make

By CLIFF HARRISON

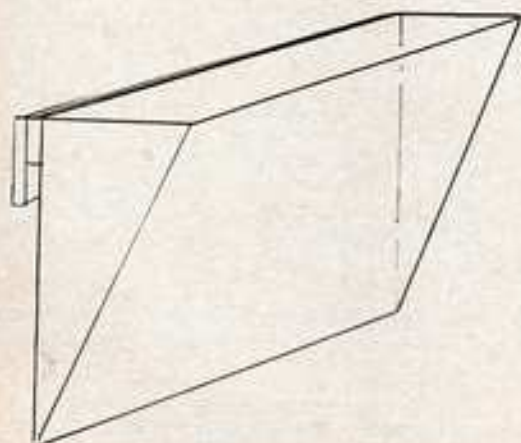
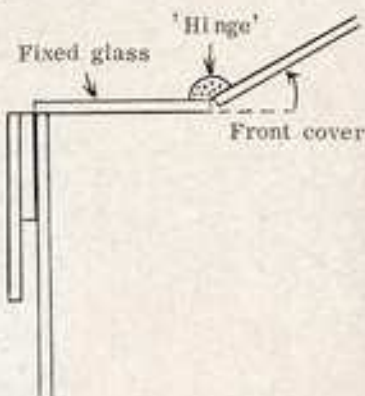
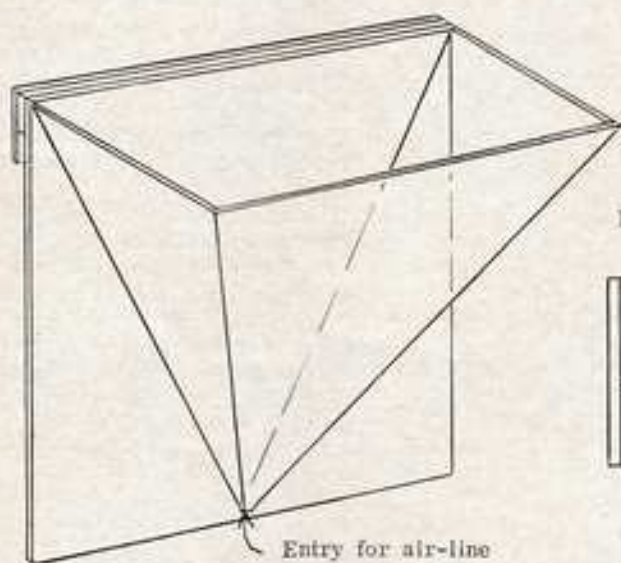
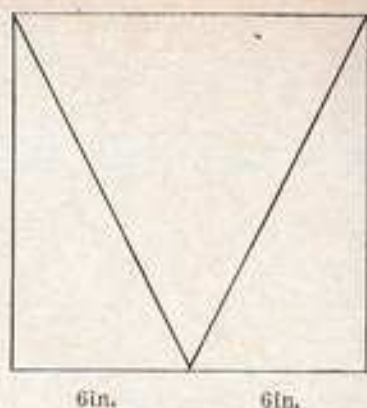
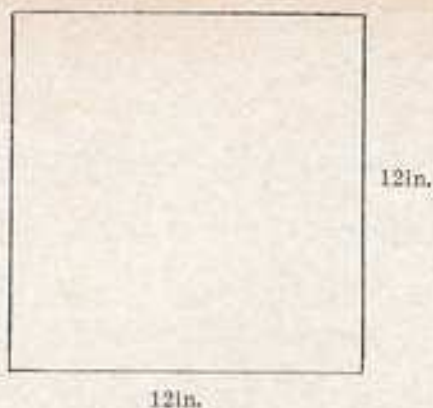
As more and more people construct their own all-glass aquaria with silicone-rubber sealant, we find that the versatility and ease of use of this product lends itself to a multitude of further applications. Take cover glasses, for example—well-fitting ones are essential if we are to reduce evaporation and prevent fishes jumping out. Special plastic or metal clips are available to hold the cover glass inside and below the level of the

top angle of framed tanks, thus preventing the formation of rust, but these accessories are not cheap and may not be a good fit for every grade of glass. Solution: cut 1 in. squares of a suitable weight of glass, smooth the edges down, and stick four of them on the cover-glass corners, overhanging the edges by $\frac{1}{2}$ in. If you cut the front ones slightly larger so that they protrude a little beyond the front of the tank, they make it easier to lift the cover for feeding, netting etc. Alternatively, small glass marbles make unusual and attractive handles if secured with a blob of the sealant.

Do you do much showing? If so, you must surely remember those occasions when your fish was down-pointed because it sulked in the corner of the tank, where the frame hid it from the judge's scrutiny; or similarly in the corner of a show jar, where distortion prevented it being assessed properly—catfish and loaches are particularly adept at this trick. A judge will not give a fish top marks if he cannot see it clearly, so build yourself some cheap all-glass show tanks and you can easily pick up an extra three or four points at a show. And don't forget a snugly fitting top for the tank, otherwise your potential



Sectional view of the breeding trap made from glass and plastic netting as described on the following pages. Size of the unit can be varied to suit the species concerned and to fit available aquaria but breeding traps should not be made too small or the behaviour of the fish will not be normal.



Construction details for the brine shrimp hatcher described in the text. Only glass and silicone sealant are used. On the left, below, an all-glass fry tank has the same arrangement of strips of glass at the back to form the 'hanger'

champion can end up on the floor—and out of the running.

For the serious hobbyist, very useful breeding traps can be made with oddments of glass: size is not too critical, but if the traps are too small the fish will not be happy in them. For a useful one, cut two pieces of 24 oz. glass 15 in. by 6 in. (sides), two pieces 8 in. by 7 in. (ends) and two narrow 1 in. strips 8½ in. long. This will produce a trap 15 in. by 8½ in., and the extra high end

panels act as legs to keep the mesh floor 1 inch from the bottom of the aquarium it is placed in. A great depth of water is not recommended in a breeding trap as it allows the parents to eat the fry eggs as they sink slowly down to safety through the mesh.

The four large pieces of glass are glued together to form the box 15 in. by 8½ in. overall. When the solvent is dry a piece of Netlon plastic mesh is glued to the bottom of the longer panels with small dabs of sealant; a half-inch of the material is turned upwards inside each end of the box and similarly glued. The strips of glass are then fixed to the end panels over the mesh to keep the unit square and rigid. Netlon mesh is available in two suitable sizes—¼ in. square mesh, or the rather smaller diamond mesh 'shading', the size selected being dependent on the size of the adults to be bred. These breeding traps may be used successfully for almost any of the livebearing fishes, and also for many of the egg-scatterers.

A pair of very useful tanks may be constructed with just a few shillings' worth of horticultural quality glass and some oddments of ¼ in. thick glass. They are made to fit on either end of an existing all-glass aquarium; no separate heater is needed as they draw their own heat from the main aquarium through the glass-to-glass contact, and will remain within a couple of degrees of the temperature of that aquarium. One is a small breeding or fry-raising tank, the other a brine-shrimp hatcher.

For the hatcher, two pieces of 24 oz. glass are required, each 12 in. square; one forms the back-plate, the other is cut as shown in the diagram into three triangles. These three are glued on to the backplate to form a rectangular 'cone', and a 12 in. strip of glass 2 in. wide is fixed to the open end, against the backplate, to keep the unit rigid. Before gluing, however, a half-inch should be cut from the lower points of the triangular pieces to allow for the insertion of a length of

plastic air line about 1 in. into the bottom of the trap, where it is glued securely when the rest of the hatcher is set. This air line is used to provide a continuous stream of air to speed the brine shrimp hatching, but if it is disconnected from the air pump the egg shells will soon settle. Lowering the open end of the tube into a bowl will then enable the newly-hatched shrimp to be drawn off in small quantities. However, when this is not being done the tube must be looped well above the water level in the hatcher to prevent the air pump being flooded. A 4 in. wide glass cover is placed over the front of the open top, and two large 'dabs' of sealant will form hinges to attach it to the back strip of glass.

The fry-raising tank is of similar construction but is wedge-shaped. The back-plate is again 12 in. square; the ends are a piece of glass 12 in. by 6 in. cut diagonally, and the front is 12 in. wide by the dimension of that diagonal (approx. 17½ in.). After these glass panels are glued, a 2 in. strip is similarly added across the top for rigidity, and a front cover-glass fitted.

For each of these tanks, the 'hanger' is of identical construction. Two 11 in. strips of ¼ in. glass are used for each hanger; one 1 in. wide and one 1½ in. wide. These are fixed to the top rear of the backplate, with the narrower strip sandwiched between the backplate and the wider strip, so that the latter forms a 'hook' to slip over the end of an all-glass aquarium. If the aquarium is constructed of glass thicker than ¼ in., the narrow centre strip should be ¼ in. thick. The fry-raising tank should be given a 1 in. layer of gravel, and a few strands of a bushy plant (such as *Elodea* or *Myriophyllum*) will provide a little refuge for the inhabitants.

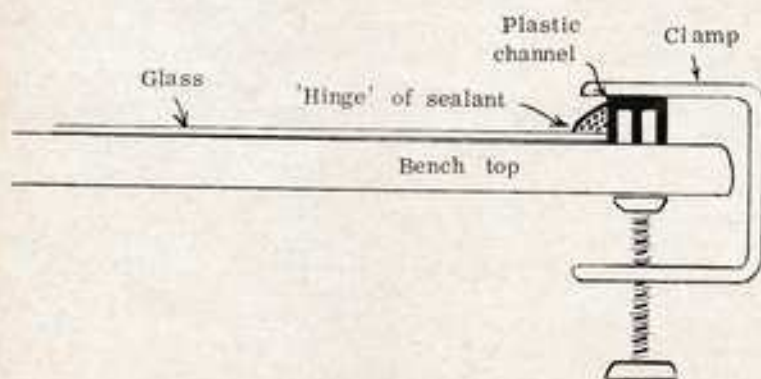
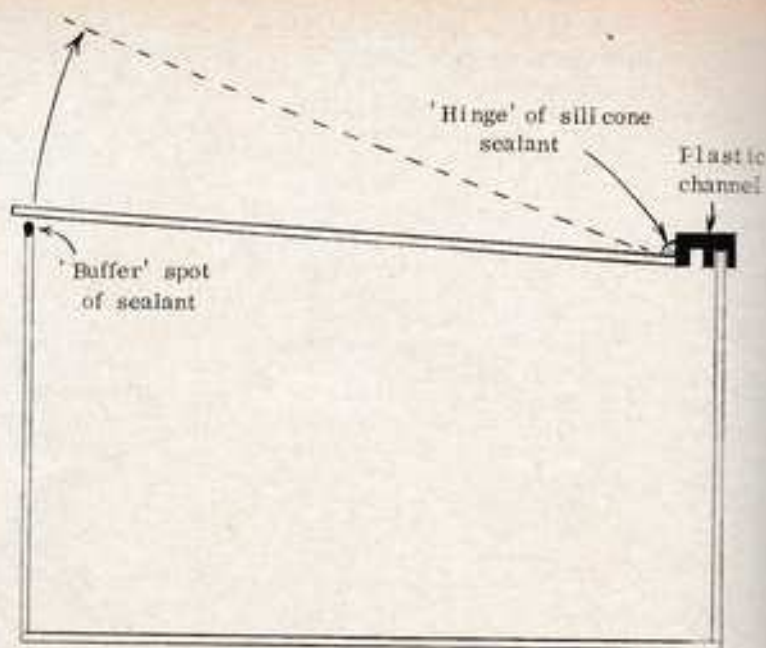
By using this pair of tanks, the hobbyist who has room for just one or two furnished aquaria for decoration can get a good deal more interest from his fish, and also ensure a steady supply of new stock to keep the numbers up.

A Hinged Cover for All-Glass Tanks

L. B. ARNOLD describes his method of making removable hinged cover glasses for use with all-glass aquaria

AN AQUARIUM cover glasses have always been a source of trouble for me and, I know, other aquarists, a problem that has increased since I have gone over to all-glass tanks. But now I think I have found the answer—a removable hinged top cover glass, which I have tried and tested in my fish house. It is easily made. All that you need are: a tube of silicone sealer (this will make more than one top glass, of course); a length of plastic channel (used for sliding door runners and bought from D.I.Y. shops) and one or two pieces of 32 oz. glass (according to size of the aquarium).

Sectional view of an all-glass tank with the hinged cover glass in position. The angle formed when the cover is closed means that condensed water runs down the cover's under surface and back into the aquarium.



In the assembly of the flap glass and plastic channel it is best to clamp the latter to a bench while the sealant is applied between plastic and glass to form the 'hinge'. After 48 hours the cover will be ready for use.

First measure the back glass of the aquarium inside and cut a length of channel $\frac{3}{8}$ in. shorter than this (to allow for any vertical fillets that would otherwise prevent the channel being slipped over the top of the back glass). Next measure the width from the channel to the outside of the front glass and add $\frac{3}{8}$ in. to the measurement; this is the width of the cover glass—the extra enables you to lift it from the front edge. Cut the cover glass to this width and to the same length as the channel. If two or more pieces of glass are being used to provide the cover allow $\frac{1}{8}$ in. clearance between the edges of each piece.

Clamp the channel to a table or bench top as shown in the diagram, place the glass or glasses

with the long edges against it and run a fillet of silicone sealer along the glass and channel to form what will be the 'hinge'. Smooth this fillet with the tip of the finger. If you put some 'spots' of the sealant on the top edge of the aquarium front glass these will act as 'buffers' for the cover glass. Leave the cover for 48 hours, after which your removable cover is ready for use.

Because of the angle of the glass when in position, condensation forming beneath the glass will run back and drop into the tank. This makes an arrangement ideal for aquaria with high rates of aeration. The corners of the glass can be cut (and the edge sealed) for air lines, filter tubing etc. entering the tank.

A Spawning of Oscars



The female of the pair guarding the eggs, which were laid on a large flat rock

Photographs by
the author

THIS is probably the best known of the 'big *T* cichlids', mainly because of its very large size—it may reach 12 in. (30 cm.) or more in captivity—and its dog-like characteristics. Indeed, more than one aquarist has been found talking to his faithful companion!

This fish was first described by Cuvier in 1829, as *Lates ocellatus*, but was not introduced to the hobbyist until exactly 100 years later when a few specimens were imported into Europe. In the wild it is found in the rivers of the Amazon Basin—Amazon, Parana, Paraguay, Negro—and has more recently been introduced to Florida waters.

It is one of the more beautiful cichlids, although the colour patterns are extremely variable. In normal 'wild-type' adults there is a velvety grey overall coloration, broken randomly by large lighter coloured blotches or stripes. Overlying these base patterns are many gold or red scales, which may be more or less numerous depending on the individual. An ocellus is always present at the base of the caudal fin; other ocelli may be present also at the base of the dorsal and are usually edged in

By IAN G. SELICK

red or gold. Young specimens, however, show a complete dimorphism, being generally an overall velvet black broken by random, small, stripes, spots or blotches. Intermediate forms may be found depending on the age of the individual.

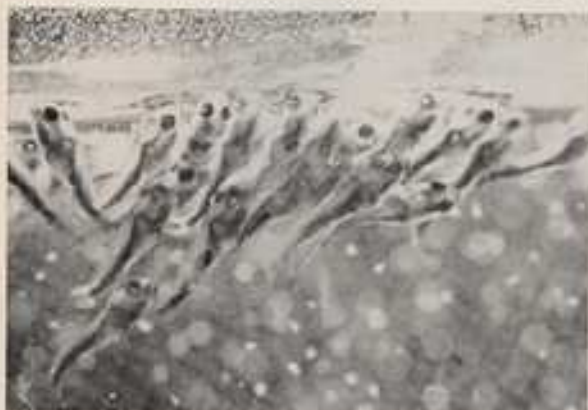
Recently, several 'varieties' of oscars have appeared on the market, namely the red, red tiger and ordinary tiger. A true red—a fish that retains a good overall red coloration throughout life—exhibits a type of xanthic mutation, the red tiger being a half-way stage between this and the normal oscar. But beware! Many of the pretty little oscars available at the local dealers have been hormone-fed by exporters to accentuate their coloration; this is how many red tigers and ordinary tigers with exceptional coloration when young, are produced. These oscars are exported from the Far East breeders under the label of 'scientifically treated

fish'. (This also applies to angel fish and discus—although other unnaturally coloured fishes should also be viewed with suspicion.) The worst thing about this treatment (with a form of the male sex hormone, testosterone) is that it may well render the fish sterile in later life—besides which, the colours usually fade quickly.

The size of oscars demands that they should be provided with a large aquarium with plenty (a layer 2 in. or more deep) of gravel and rockwork; be careful not to 'balance' rocks—oscar are strong, and flooded rooms have been known! They are not too fussy about water conditions, but to encourage breeding in a shy pair, try a mixture of half soft water and half tap water and raising the temperature a few degrees from the normal of 72-77°F (22-

established specimens is more serious. If this is not attributable to sudden shock or change of routine, water conditions should be checked (these large fish can foul a cramped aquarium extremely quickly), and a change of water and food is recommended—try some live fish. If holes in the head should appear, an antibiotic treatment may be tried, together with feed of live fish.

If you have several big oscars together in a large tank, and they are generally fat and healthy, then you may be surprised by sudden commotion, jawlocking and fighting in your previously peaceful tank. Now is the time to prepare for a large increase in population! Oscars are sexually mature at 12 cm, but are extremely difficult to sex. Some authors (Gunther Sterba) state that the males have



Left, a group of young oscars 3 days after hatching, with the yolk sacs still evident. Right, a youngster at 6 days after hatching

25°C). As befits their large size—and matching mouth—these fish need a lot of feeding. Youngsters will eat anything you can afford to give them—earthworms, freeze-dried foods, scraped/grated/chopped meats, clean dog food, mussel. However, as they get larger they should get some live fish (breed guppies or goldfish for them) to ensure a supply of vitamin E, as a lack of this seems to lead to a 'hole in the head' condition which is extremely difficult to cure.

Their voracity and large mouth naturally precludes them from all but the 'large fish' community aquarium, although during breeding they may not tolerate any other fish in the aquarium. They are very active and are great jumpers—so beware when lifting the lid for any maintenance or feeding. New specimens may be timid and sulk a little until they have got used to the habits of their new master; try to disturb them as little as possible, and to establish a regular routine. However, soaking in

three light spots at the base of the caudal fin, but this is certainly not always the case. The only sure way to tell is to feed the fish, and if he comes first, you have a male; if she comes first, you have a female!

Spawning is preceded by often vigorous jawlocking and shimmying, and then cleaning of a large flat rock on which the eggs (800 or more) are laid carefully by the female, followed by the male fertilising them. It is only at this stage that sex differences can be confirmed, the female having a broad ovipositor, the male a thinner, pointed one. The eggs are usually an amber colour and hatch in about 4 days, depending on the water temperature. They are guarded by either one or both parents—if any parental quarrels occur you may remove the fish responsible, or the eggs, both dangerous procedures. One particular spawning will be described.

The eggs were laid at dusk and hatched on the

morning of the fourth day. The youngsters were leaping over the gravel bottom by the afternoon, although they still had prominent yolk sacs, which disappeared by the fifth day after hatching. During hatching the eggs turned slightly milky, and the parents then covered them with a thin layer of fine gravel—presumably to prevent the youngsters sticking together.

As soon as the yolk sacs of the fry had been absorbed, I siphoned about half of the youngsters out of their pit home, dug by the parents, and placed them in their own water in an 18-in. by 12-in. by 22-in. tank with fairly heavy aeration. They were given newly hatched brine shrimp as a first food, their stomachs soon showing a characteristic bright red. As a supplement, and as they grew, they were given powdered dry food (soon recognised), ground white worm, micro worm and scraped ox-heart. Ten days after hatching they were too crowded, so they were split between several aquaria, runts

being sorted out and fed to the parents at this stage.

Once the fry were feeding on meat, they didn't look back, greedily accepting anything their parents would eat. The golden rule is, keep them clean and well fed—and watch their mouth size.

Meanwhile, the parents had eaten the rest of the youngsters, and were preparing to spawn again. A word of warning; do not try to keep more babies than you can accommodate: they require frequent and heavy feeding; quality should be aimed for, not quantity—and besides there will be only a limited demand for the young in your area.

So, if I have by now put you off keeping oscar, I'm sorry, but you will realise the problems involved; if I've encouraged you to have a bash, I am sure there are plenty of breeders looking for outlets for their vastly overcrowded stock tanks of youngsters!



Outline diagrams of the female (top) and male (below) to show differences observable at the stage of spawning. Before the appearance of the ovipositors no reliable means of distinguishing males from females is available.

What's New?

Furniture Aquaria

AN interesting new range of cabinet aquaria is being advertised in this month's *fish* by Vitakraft. These tanks, many of which are of shapes, for example hexagonal, quite new to British fishkeepers, are each designed as a single, elegant unit of furniture. Each cabinet is built specifically to house its own particular shaped tank, and the manu-

facturers have been at pains to design a piece of furniture that they anticipate will enhance the appearance of any room. There are aquaria built into antique style cabinets to match such styles as 'Baroque' woodwork in walnut and other woods. Other designs have been devised to fit in with modern decor are in orange/white or red/white with built-in cupboards. The unit has its own fitted filter for ease of maintenance. A colour brochure can be obtained free from Vitakraft, Broadbottom Post Office, Hyde, Cheshire.



by
ARPEE

Personal COMMENT

In common with numerous other readers I was intrigued by Jim Burtles' letter in January's PFM on the subject of 'Living Filters'. His notion of associating the Infusoria-producing apple snail (*Ampullaria cuprina*) in support of freshwater clams is an ingenious and constructive one, and makes a pleasant change from some of the irresponsible and dangerous combinations of aquatic creatures one so often reads about, especially in the context of marine tank management. Of course, all marinists are waiting for the day when something like the apple snail comes along and simplifies not only the initial nurturing of fish fry, but also the maintenance of the numerous creatures in natural systems which depend so largely on the extraction from the surrounding water of animal and vegetable particles.

Judging by the account of his own success—and this is what matters—his technique is workable, and I should very much have liked to try it out some thirty years ago when I was the proud owner of a breeding pair of bitterling. The letters from Mr Bywater and Mr Turner suggest, respectively that he should beware of the larvae of swan mussels and that the species of *Sphaerium*, *Pisidium* and *Dreissensia* would prove more suitable inmates for aquaria, because of their more modest size and food requirements. I believe it is true to say that the clams embraced by the genera *Unio* and *Anodonta* reproduce by extruding larvae (glochidia) whose aim is to avoid being carried down to the sea in the running water that is their natural habitat. They are therefore equipped with sticky threads with which they anchor themselves to rocks or plants, and with hooks by which they attach themselves to available fish. When ready to face life as complete molluscs they cast loose and use their more familiar means of adhesion to remain *in situ*.

By contrast, the *Sphaerium*, *Pisidium* and *Dreissensia* clams retain their young until they are shell-bearing, and only then release them into the river bed. Parasitism is not therefore part of their life cycle, and this supports Mr Turner's overall appraisal. Mr Bywater's remarks about damage to

minnows were most interesting as I have hitherto believed that most of these temporary symbiotic relationships are of little consequence to the host, assuming it to be a normally fit specimen. Nonetheless, as it seems that the glochidia attach themselves both to the body exterior and to the highly vulnerable gill area, individual fish most certainly could receive an overload of passengers, and in these circumstances deterioration would be inevitable.

Aquarists wishing to improvise on this theme of Mr Burtles would do well to bear in mind that the water should be very well aerated—not only because this best suits the clam, but because it is a valuable buffer against pollution, which, in the case of all dead molluscs, can be both swift and terrible and powerful enough to bring down the very wrath of heaven on the unwary. Plant life is certainly at risk if you use the larger molluscs, but in large aquaria it may be worth trying to confine them with stone emplacements, as recommended by Hervey and Hems in their classic on the garden pond. If this is disregarded or fails to work your tank will resemble a wind-whipped beach of dunes and gullies as the mobile clams go about their ways, but to those responsive to the wiles of Nature rather than of man, such forms have their own particular attractions.

I am sure that dealers tend not to stock the mollusca mentioned by Jim Burtles for purely financial reasons—that there is not at present an adequate demand. They are not likely to be greatly sought after for use in ponds for fear of what damage they might inflict on fish, and as they would tend to remain invisible there would always be some anxiety about their actual well-being. It would be greatly to the credit of the trade if some attempt could be made to make available modest quantities of the species mentioned above, however. Nothing like enough is known about the habits and requirements of these animals, which are cheap enough and common enough to collect and distribute, without major effort, to those who are interested enough to learn more about them. I hope that in particular some of our younger and more inquisitive readers will be tempted to do some research into the aquarium behaviour of the mussels.

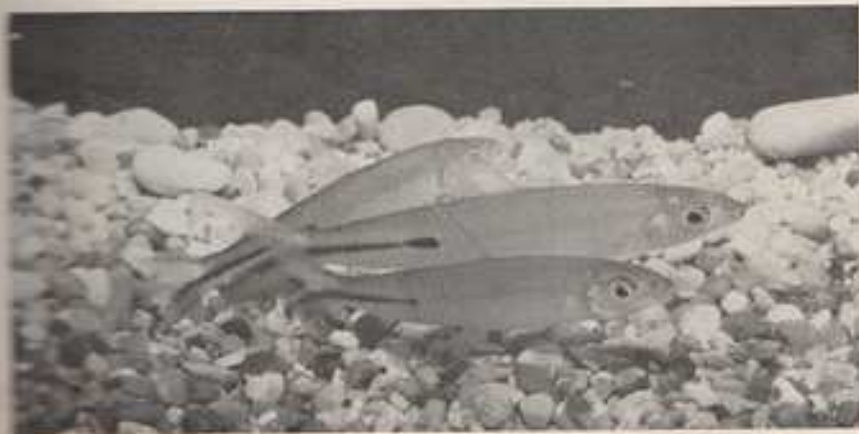
To those who would scoff and say that this isn't fashionable I would simply comment that it makes more sense to experiment along these lines than to try fancy tricks with tropical marine fire clams, but plenty of beginners are doing just this in response to misdirected trade pressure. Until they have done their homework properly, purchasers who fall into this category simply demonstrate that they have more money than sense.



Is it New to You?

Photographs on this page show three species in recent importations received by Scanstock Aquatic Nurseries near Reading, Berks. On the left is a species of *Forlowella*, a 'needle fish' whose body tapers almost to a point at the tail end. Shipped from South America, the largest specimens were 8 in. (male) and 10 in. (female). Below is a species of fire eel (*Mostocembelus*) with peacock eye spot markings in the dorsal fin, shipped from India. Possibly a colour variant of a better-known import, the specimen shown is about 5 in. in length.

Photographs
by
CLIFF
HARRISON



Redtail hemiodus, a lively species (*Hemiodus gracilis*) shipped from South America. These fish are about 2-3 in. in length and the largest imported specimen was about 5 in. long. Beneath the black line that runs into the tail fin there is a bright red flash in the bottom caudal lobe.



The white transparent patches characteristic of the 'neon tetra disease' (plisporiasis) are seen on the back of this sick fish.

THE parasite causing 'neon tetra disease' or plisporiasis, the protozoan *Plistophora hypobryconis* (Microsporidia, Nosematidae), was first identified and described by Schaperclaus in Germany in 1941. Since that time plisporiasis has been identified many times and since World War 2 has become the commonest disease amongst aquarium neons. Articles about the disease have been published in all parts of the world as further knowledge about it has been gained.

Our basic knowledge of the cause and symptoms of this disease come from this initial work of Schaperclaus. The first symptoms are taken to be the white or translucent spots in the muscular systems of the body or head, disturbance in pigmentation, fin decay, disturbance in equilibrium and emaciation. Thieme has noted that infected fish swim incessantly without rest. The parasites localise themselves predominantly in the muscular system of the body, where they cause the formation of innumerable cysts, spherical in shape and from 0.070 mm. in diameter. Inside the cysts are spores,

Plistophora Tropical

By

Photographs by

(Microphotography by

each 0.004-0.006 mm. long and about 0.003 mm. wide. As well as in *Parachanna inveni*, the parasite has been identified in *Hyphessobrycon gracilis*, *H. flammens*, *Hemigrammus ocellifer*, *Brycon danio rerio* and *Danio frankei*.

In our own experimental work we have identified innumerable cysts of the parasites in the muscle fibres of the lateral muscular system. The infected fish were dissected and histological sections prepared by means of a microtome so that the locality and intensity of the cysts could be assessed. As our experiments continued and covered all kinds of tropical fishes, we found that only certain muscle groups were concerned. In all cases we discovered numerous cysts in the muscle systems of the sides of the fish, with the lower parts of the cross-sections being more intensively infected. Cysts were not identified in the muscles of the head, the gill arches or in the heart muscle. The



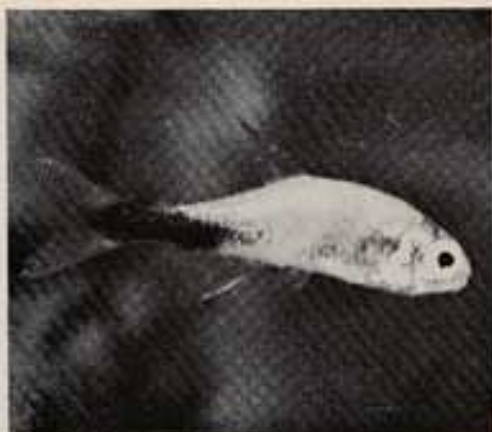
In this thin section of muscle from a fish, viewed at low magnification, numerous cysts of *Plistophora* form lines or groups in the muscle fibres.

Disease in Fish

Dr ZDENEK LUCKY

RUDA ZUKAL

(the author)



Emaciation accompanies the state of severe infestation with the parasite *Plistophora*. This fish did not recover from the disease

muscles of the pectoral fins and the muscle bundles (myomeres) of the upper parts of the lateral muscles were infested only in isolated cases.

The cyst count in highly infested muscle bundles usually reached between 60 and 150. In a single muscle fibre the highest count we discovered was 22 cysts. Cysts were found also not only in the muscle fibres but also beneath them and in the connective tissue of the myosepta, which they probably reached after destruction of the muscle fibres. The cysts were elliptical, from 0.008 to 0.030 mm. in cross section, often in masses or one behind another in any one muscle fibre. The cysts had a relatively strong coat. Inside the cysts were always countless egg-shaped, often pear-shaped, spores from 0.006 to 0.007 mm. by 0.003 to 0.004 mm. in size.

A badly diseased *Danio frankei* was emaciated and swimming erratically. It had a caved-in

abdomen, moved painfully, was apathetic and had a strikingly bright colour. After a few days the fish died of complete exhaustion. During dissection it was established that all the muscles were permeated with a large number of cysts. Unlike previous cases which had died of plistophoriosis, this infestation was many times more extensive and the cysts occurred in the entire lateral muscle and also in the back area in front of the caudal fin. The number reached several thousand. We found numerous foci also in the gullet and in the upper part of the gut. The cysts were in great clusters, which completely took over the infested muscle fibres. The size of the cysts and the spores was in accordance with the literature. In no other organs were the cysts or spores identified.

Other authors maintain that the kidneys (Thieme) and ovaries (Schäperclaus) can also become infected. According to our research, *Plistophora* is specifically a muscle parasite. After the parasites have succeeded in destroying the muscle fibres, especially in a very heavy invasion, the infestation is passive in other organs, and also on the external surface. New outbreaks are caused by spores being picked up by fish with their food. A very heavy infestation can be caused by the swallowing of parts of the muscular system of fishes which have died in the tank of plistophoriosis, because the muscle mass contains many thousands of spores.

Treatment for the illness is not yet perfected. By removing suspected diseased fish showing white flecks from the aquarium we have prevented the spread of this devastating parasite to further fish in the aquarium.



High-power magnification of the thin section of fish muscle (opposite) reveals the egg-shaped spores of *Plistophora* within the cysts

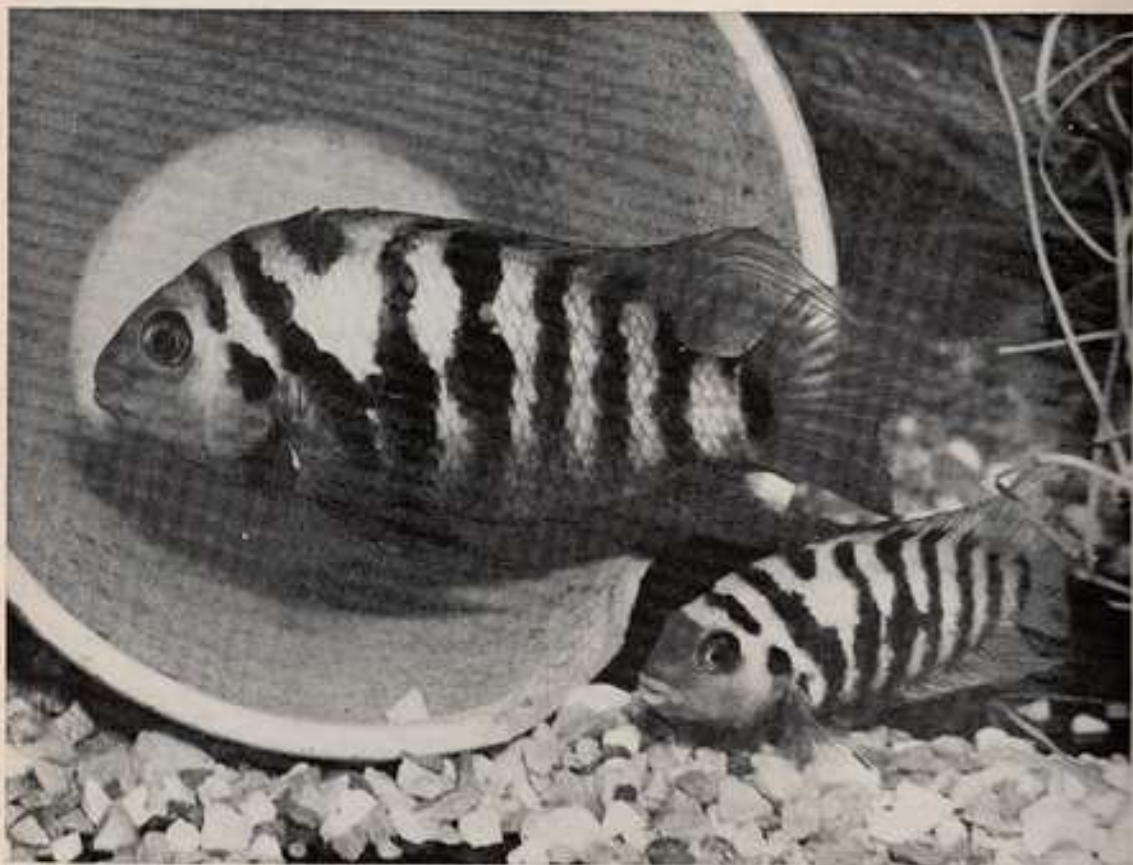


Photo: JAMES DUNBAR

The breeding pair of convict cichlids with the flower pot used for spawning

Convict Cichlids Prove to be Ready Spawners

ON a recent visit to a fellow aquarist's fish house, when showing me his various tanks and fishes he came to a tank containing an adult pair of convict cichlids (*Cichlasoma nigrofasciatus*) and said 'I had great fun breeding these fish'. Well, I was surprised, to say the least; this was the first time I had heard anyone describing breeding of fishes as fun; I had always looked on the spawning of a particular species as somewhat of an achievement!

When he suggested that I should borrow the pair and try to spawn them in my own tank I was delighted. At my home I placed the convicts in a tank containing other cichlids of their own size, where they were fed on tubifex worms,

By JAMES DUNBAR

liver and ox heart. On this diet the fish soon came into breeding condition. During this time I set up a 15 in. by 15 in. by 12 in. tank, with gravel to a depth of 2 inches; clumps of artificial hair grass and a large flowerpot furnished the tank. The water temperature was adjusted to 80°F (27°C) and the whole was left to settle for a few days. The female and male were then placed in this tank. The female took on golden bars in the belly region, really filling out with roe, and

the male's colour also intensified.

Two days later I went into the fish house and saw inside the flowerpot row after row of brown insect eggs. I had just missed witnessing the spawning! However, what followed over the next few days soon made up for this.

The female continued to watch over the eggs while the male watched the flowerpot and eggs from the shadows. It was when the eggs commenced to hatch out and fall to the bottom of the flowerpot, the tails of the fry thrashing the water, that the fun really began.

The parents started to dig pits in the gravel, and then one by one the wriggling fry were gently picked up in the parents' mouths and spat into a pit. These were the first cichlids that had spawned for me who carried out this form of duty. Two or 3 hours later the fry were back in the flowerpot.

After each flit I saw that the fry were gradually becoming fewer. I couldn't believe the parents were eating them, as they moved them so gently. Then I noticed that when the fry were being moved from the pit the parents would also lift some gravel, and it was as the parents spat out the fry and the gravel they were unknowingly killing their young when the gravel struck the fragile fry.

I also noticed during removals that the female would drop some fry on the way to the pit; the male, seeing this, would for some reason pick up the fallen fry and spit them into the flowerpot rather than into the pit, whereupon the female would re-lift them and transfer them herself to the pit. This happened time after time.

The moving around continued for another few days, and by this time the fry were taking short excursions outside the flowerpot. The number of fry was down to 50, from about 200. I decided that the moving around was causing too many casualties so I removed both parent fish. On removal the fish lost their intense coloration—grey blue in the male, with heavy blue-black bars, which incidentally I believe give the fish their name; the female was similar except that in the lower region of the belly were irregular orange blotches, extending into the lower fins.

The following day the fry were free-swimming, and food provided for the first few days was Infusoria, while the brine shrimp eggs were hatching. As well as hatched brine shrimp the fry were next given macro worms and when about 4 weeks old this diet was supplemented with chopped tubifex. I had to agree with my friend—the convict is a very interesting cichlid to breed, giving many hours of pleasure—and fun!

Native Marines in the Aquarium

By GRAHAM ROBERTSON and GRAEME ROSS B.Sc.

MODERN aquarium techniques can be used with native marine aquaria as well as with tropical marines—something that tends to be overlooked. Quite a few of our fellow members of the R.M.A.A. keep native marines and find them the perfect complement to tropical marines or even freshwater tropicals. Tropical fish are enjoyed most during the long winter evenings whereas native marines come to the fore in the summer, when a very enjoyable time can be had collecting specimens at the seashore.

The first essential is a good aquarium made of a non-toxic and non-corrodible material. There are a number of suitable types commonly available: e.g. Gem (heavy duty), polycoated angle iron, stainless steel, plastic, fibre glass, all-glass etc. Juwel aquaria are very good but care must be taken not to damage the anodised surface as corrosion may afterwards take place. All glazed aquaria must be silicone-sealed to prevent the glazing putty from coming in contact with the sea water. A close-

fitting cover glass is essential to prevent corrosion of the hood and light fittings.

There is a great deal of controversy over filtration in marine aquaria but we have found under-gravel filters to be both the cheapest and most effective. However, undergravel filters designed for freshwater use are of little or no value in marine aquaria. Ideally a marine undergravel filter should possess large ($\frac{3}{4}$ in. diameter or above) air-lifts and the base plate should cover the entire floor of the aquarium. Not only does the undergravel filter provide a high rate of filtration but it acts biologically on the toxic wastes of the fish and converts them into harmless products. There are certain by-products produced which tend to lower the pH so do not be too alarmed if you find the pH drops somewhat. If an undergravel filter is used, in preference to a power filter, say, the gravel should be $\frac{1}{4}$ – $\frac{3}{8}$ in. diameter for maximum efficiency and ideally should contain some calcareous material such as marble chips, crushed coral or shell as this

helps maintain a high pH.

Whenever possible natural sea water should be used. This should be collected from an area free from pollution. If there is a sewer opening nearby or a lot of debris on the surface of the sea do not collect the water. Collect from rock pools low down on the shore line at low tide. Sediment will have settled and the water will be generally clear. Well washed 5 gallon plastic sherry containers make useful carriers and are available cheaply. However, any non-toxic vessel may be used.

Synthetic sea water can also be used but this is obviously inferior to natural sea water, although it is more easily stored. Do not be dismayed if the natural water goes cloudy in a day or two. This is a natural reaction due to an increase in the number of bacteria in the water. The cloudiness should clear in a few days. Alternatively the water can be heated to about 150°F to avoid the cloudiness happening. Sea water must be kept at a certain density, between 1.020 and 1.025, checked with a hydrometer. The density will vary with the temperature at which it is measured and so a hydrometer calibrated at 60°F is the best type to use as it is probable that the temperature of the water will be somewhere around this mark. Any evaporation should be replaced with freshwater as, of course, the salts in the water do not evaporate.

Up to this point the setting up of a native marine tank is little different from setting up a tropical marine one, but we now begin to do things a little differently.

After the water has been added to the aquarium it is then time to consider decorating it. Without doubt the most natural effect will be achieved by using rocks from the sea that are encrusted with marine life. For background rocks try to obtain ones which are wafer-like, as these will displace little water. If care is taken in selection, pieces broken from cliff strata will give a natural cliff-face effect. Ideally the rocks should have a good growth of seaweed on their surface, but we will return to this subject later. Try to avoid rocks covered with filter feeders such as barnacles, mussels etc. as these will be most likely to die owing to insufficiency of food for them. Corals may be used if desired but the authors consider that these spoil the natural effect of the tank obtained by using materials solely from our own coasts.

The use of algae, or seaweeds as they are commonly called, in the marine aquarium is still very much in the experimental stages. Some of our native algae, however, will grow quite well in the aquarium. Do not attempt to grow brown or red algae unless you are prepared to set up a special aquarium for them as they require special conditions. The green algae found growing in rock pools and on stones during the summer months survive well in the aquarium. These include *Ulva lactuca*,

Enteromorpha compressa, *E. intestinalis* and *E. linza*, all of which remain quite small, growing to about a foot in length.

When transporting algae-covered rocks be very careful with them as the seaweeds mentioned above are very fragile and easily damaged. By taking whole pieces of rock the seaweeds' holdfast, i.e. their attachment to the rock, will be left undisturbed and greater success will be achieved.

Alternatively it may be easier to remove limpets that have algae growing on their shells if suitable rocks cannot be found. The animal should be removed unless one wishes to keep live limpets.

The use of algae brings us to the question of lighting. This has to be as strong as possible and should contain a large proportion of sunlight if it is desired to have a good growth of green algae. Gro-lux and tungsten lighting can be used together to give a natural appearing lighting effect. No hard or fast rules exist for the wattage and length of time of lighting and the individual aquarist will have to discover the best lighting conditions for his own aquarium.

With the aquarium set up and suitably decorated it is time to consider the collection of specimens to add to your display.

Rocks taken from the sea will already harbour a certain amount of sessile life upon their surface, which will add considerable interest to the aquarium.

The collection of specimens is probably one of the most enjoyable aspects of native marine fish-keeping. There is a sense of achievement in stocking an aquarium with specimens caught by oneself. Before we consider the actual inhabitants themselves a little should be said about methods of collecting. First choose your site. This may sound very obvious but choose the area from which you are going to collect very carefully, particularly if you live inland and have to make a long journey to the coast. Without doubt the greatest variety of life suited to aquaria is to be found on rocky shores. Most life on sandy shores lives under the sand and so are rarely seen in the aquarium.

The equipment required for collecting is quite simple: nets, a plastic bucket (or polythene bags), a knife and a metal or wooden rod to poke into crevices. The latter is very important in certain areas where the rocks occur in strata and there are many crevices where specimens may lurk. Remember to check the time at which low tide occurs. Local papers usually give the time of high tide and low tide occurs at approximately 6 hours either side of this.

It would be tedious and pointless to list all specimens found on our coasts as there are many good books which do this. We will, however, list the main phyla next month and discuss their suitability for home aquaria.

Readers' Queries Answered



A Foreground Plant

What is 'micro sag,' please? I cannot find it in any of my plant books. My local aquatic store is selling it as a foreground plant but I do not want to plant it and have it grow taller than I require.

This plant, once known to aquarists as *Sagittaria microfolia*, is in fact now called *Echinodorus tenellus*, which is the name you are most likely to know it under, or the pygmy chain sword. The smallest variety of *Echinodorus tenellus*, which is presumably the one your trader is selling, does grow only to 2-3 in. in height and may keep even smaller than this.

Marbled Hatchets

I have four marbled hatchet fishes (Carnegiella strigata). One of these fishes is definitely fatter than the others; could this be a female and if so how do I go about breeding them?

Marbled hatchet fish have been found in the aquarium though reports of the occurrence are very infrequent. One of the fullest was published in the German magazine DATZ in May 1967, subsequently translated and published in TFH (U.S.A.) in November, 1972. The female was thought to be the heaviest fish of a group of seven and this fish plus two 'slender' ones were placed in a 12 in. by 12 in. by 8 in. tank, scrupulously cleaned and filled with distilled water that had been boiled, allowed to stand over peat, filtered and heated again until it reached a hardness (DH) of 2.5 with a pH of 7.8. Gravel on the bottom, bunches of *Myriophyllum* and a temperature of 84°F were other details. The tank was blacked out except for the top glass, which received 4 hour of direct sunlight each day. The spawning took place about a week later on a cloudy day with only little sun (the author, Herr Klaus

Kluge, thought this might be critical—or possibly the quart of clean rain water added a couple of days before). Eggs were expelled three or four at a time over a period of an hour or two, just below the water surface. Some sank to the bottom and some remained in the *Myriophyllum*. The parents had to be removed as they started to eat the eggs. The fry hatched after 36 hours and were kept in a darkened tank. They became free-swimming 3 days later and were fed on Infusoria. A week after this they were fed with brine shrimp. The typical body form began to show itself after about 18 days.

Community Breeding

*Is it likely that the pair of *Nannacara anomala* that I have in a community of medium-sized fishes will spawn in the community tank? There is no flower pot in the tank for them to spawn in but they seem to be making efforts to 'clean up' one end of the tank. I don't wish to breed them particularly but I just wondered what were their chances of rearing any young?*

This does depend to some extent on the fishes they are being kept with. Some of the larger barbs, cichlids and any aggressive species could cause problems, but it is quite likely that the pair will spawn and indeed raise their young in the community tank. The lack of a flower pot will cause these dwarf cichlids no worries—they are quite likely to spawn on a flat rock, in a depression in the gravel, at the base of a large plant, or, as J. Lee reported in 1971 (February, 1972), in some quite bizarre fashion as for instance on a plastic feeding ring that had been weighted down with lead strip close to the bottom of the tank. They are prolific breeders and will breed under a great variety of

conditions—spawnings have been reported at temperatures of from below 70° up to 78°F and at a wide range of pH and DH readings. Ideally, once the spawning is complete a tank divider could be used to separate the female and eggs from the other tank occupants, including the male, so that the fry can receive a little specialist feeding of Infusoria, Liquifry, followed by brine shrimps and micro worms, but if you are not particularly anxious to breed them you might just as well leave things to take their course—you may well find that in 6 month's time the *Nannacara* young are themselves breeding in your tank.

Flying Barbs

My dealer has some 'flying barbs' now available. Although they are not very colourful I would like to buy two for the community tank. Are they suitable and how they are special requirements?

Yes, flying 'barbs' (*Epiplatys danricus*) are suitable for a community of small- or medium-size fishes. They are quite peaceful and spend their time in the upper portions of the tank. They also require their food to be available in this part of the tank, but there should be no problem about this as floating dried food, daphnia and midge larva will supply their wants. They also prefer clean water, so that a tank with an already large population or one where the muck is continually stirred up by catfish does not provide the best environment. The really essential thing with these fish is to make certain that the tank lid is well fitting, as they are capable of leaping out of the water. You will also be pleasantly surprised by the appearance of your fish once they are settled in a well-planted, established tank. They belong to the group of fishes whose delicate iridescence is quite lost in a dealers' holding tanks. Against a dense background of plants, particularly if the light can fall on them from the front of the tank rather than from the middle, they show up as an extremely handsome addition to a community. Incidentally, they are not in fact very close relatives of the more common 'barbs' though, as their common name implies, they have two long barbels stretching rearwards for half the underside of their bodies.

Long-finned Characin

Are Alestes longipinnis suitable for the community tank?

The phrase 'community tank' simply means a tank of fishes that can be kept peaceably and suitably together. *Alestes longipinnis* can be kept in a tank with other fishes but since it can reach a length of about 5 in. it is most suitably kept with fishes of a similar size—and peaceful

fishes at that; it is not a 'bold' fish and boisterous companions, such as a brace of large red-tailed black sharks, would send it into hiding. It therefore requires a well-planted tank where it can find cover. In spite of being nervous it is an active swimmer and requires a large tank in which to exercise. Soft and slightly acid water also figures on the list of its requirements.

AquaGLOSSARY

No. 9

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

Cara (Greek): head. Pronounced 'kar-rah'. For example, the genera *Ophiocara* ('oh-fee-oh-kar-rah': snake-head), *Thysanocara* ('this-sah-no-kar-rah': fringed or tasselled head) and *Xenocara* ('zen-no-kar-rah': strange head).

Carus (Latin): valuable. Pronounced 'kar-uss'. With the negative prefix *a-*, this root has formed the old generic name *Acara* ('ah-kar-rah'), literal meaning 'without value', i.e. 'trash fish' of no economic importance. Genus re-assigned *Aequidens* ('ek-wee-dens') but the old name has been preserved in the popular names of the cichlids called blue and brown acaras, for example, and in the genus *Nannacara* ('nan-ah-kar-rah'), the dwarf acaras.

Chroma (Greek): colour, paint, decoration. Pronounced 'krow-mah'. A root used to form the genus name *Chromis* ('krow-miss') for some marine pomacentrid fishes, which have certain features in common with cichlid fishes. Numerous African cichlid generic names include *chromis* as a suffix: *Haplochromis* ('hap-low-krow-miss'), meaning single coloured; *Hemichromis* ('hemmy-krow-miss'), half coloured. In some names this suffix is used to indicate the *Chromis* genus without regard to its 'colour' meaning: thus, *Nannochromis* ('nan-no-krow-miss'), meaning dwarf chromis (*nanno*, Greek: dwarf); *Rhamphochromis* ('ram-fu-krow-miss'), beaked chromis (*rampho*, Greek: beak).

Penta (Greek): five. Pronounced 'pen-tah'. For example, in the trivial name of the five-banded tiger barb, *Barbus pentazona* ('bar-buss pent-ah-zo-nah'), which means literally five girdles (*zon*, Greek: girdle).



THE award for the best fish in the show, and the FBAS trophy, at RIVERSIDE AS Open Show was won by Mr J. Bates of Ealing. 654 fish were entered and results were as follows:—

B: 1, Mr S. Mason (Rochampton); 2, Mr B. Bisson (Basingstoke); 3, Mr R. Silliam (Ealing). C: 1, Mr P. Elson (Freedance); 2, Mr J. Pollard (Kingston); 3, Mr J. Jackson (Basingstoke). D: 1, Mr J. Bates (Ealing); 2, Mr D. Howe (Arnon); 3, Mr J. Hughes (Rochampton). Da (angels): 1, Mr J. Bates; 2, P. O'Bryan (Thurrock); 3, Mrs M. Nethersell (Riverside). Db (dwarf cichlids): 1, Mr M. Chapman (Basingstoke); 2, Mr K. Purbrick (Hendon); 3, Mr J. Bayly (Sudbury). E: 1, Mr C. Sawford (Rochampton); 2, Mr Mackay (Kingston); 3, Mr G. Elson (Freedance). Ea (fishers): 1 & 2, Mr A. Taylor (Sudbury); 3, Mr L. Brazier (Sudbury). F: 1, Mr J. Jackson; 2, Mr M. Walker (BKA); 3, Mr J. Bates.

G: 1, Mrs P. Lambourne (Rochampton); 2, Mr D. Lambourne (Rochampton); 3, Mr D. Howe. H: 1, Mr J. Bates; 2, Mr T. Adams (Hastings); 3, Mr L. Brazier. I: 1, Mr S. Mason; 2, Mr K. Eldridge (Sudbury); 3, Mr R. Pook (Hemel Hempstead). K: 1 & 2, Mr P. O'Bryan; 3, Mr R. Pook. L: 1, Mr A. Lushy (Mid-Herts); 2, Mr T. Cruickshank (Ealing); 3, Mr W. Sutton (Freedance). M: 1, Mr R. Lefevre (Kingston); 2, Mr T. Hewitt (Lewisham); 3, Mr D. Lambourne. Mb m (egg-layers, pairs): 1, Mrs P. Lambourne; 2, Mr R. Burton (Freedance); 3, Mr L. Brazier. No-t (livebearers, pairs): 1, Mr A. Lushy; 2, Mr L. Brazier; 3, Mr A. Heath (Lewisham).

O: 1, Mr K. Usher (Sudbury); 2 & 3, Mr R. Rogers (Sudbury). P: 1, Mr K. Lewis (Rochampton); 2, Mr R. Howe; 3, Mr S. Heels (Bishops Cleeve). Q: 1, Mr T. Cruickshank; 2, Mr J. London (Thurrock); 3, Mr M. Strange (Basingstoke). R: 1, Mr G. Elson (Freedance); 2, Mr V. Gibson (SAPA); 3, Mr P. O'Bryan (Thurrock). S: 1, Mr J. London; 2, Mr A. Heath; 3, Mr R. Howe.

T: 1, Mr A. Heath; 2 & 3, Mr R. Newman (Uxbridge). Xb-m (egg-layers, breeders): 1, Mr V. Green; 2, Mr T. Adams; 3, Mr D. King (Rochampton). Xo-t (livebearers, breeders): 1, Mr V. Green; 2, Mr E. Bisson; 3, Mr A. Powell (Riverside). Z: 1, Mr S. Miller (Rochampton); 2, Mr P. O'Bryan; 3, Mr J. Nethersell (Riverside).

Water filtration in ponds was the subject of the discussion when the second meeting of the NORTHERN SECTION OF THE BRITISH ROYAL SOCIETY OF AQUARIUM KEEPERS SOCIETY was held in Manchester. A series of coloured slides, provided by the Society's chairman Mr E. Allen, were shown to illustrate pond construction, undergravel filtration and a Japanese water-changing system. The Section now has 40 members and the next meeting will be held in Leeds on Sunday, 20th May. Full details may be obtained from the Section secretary, Mr W. R. Seal, 7 Highlands Road, Offerton, Stockport, Cheshire (s.a.c. please).

The BKKS, with a present membership of over 270, welcomes

anyone interested in koi-keeping, and it is hoped that a further local section will be formed in the Watford area. Membership details will be sent upon request to Mrs H. M. Allen, 1 Anthony Close, Peterborough, PE1, 3JU (phone: 0733 17902).

Mr H. HUBBARD of Peterlee was awarded the President's trophy for the competitor winning most points at the **HOUGHTON & DAS** Open Show. 252 entries were bonded and judges Mr K. Law, Mr R. Atherton, Mr A. D. Bebbington and Mr G. Hunt gave the best fish in show award to an entry of Mr R. Greenly of Half Moon AS. Peterlee were the society winning most points in the show and received the Blue Riband trophy. Detailed results were:

Furthest (big): 1 & 2, Mr J. Robertson (Old Pleasant); 3, Mr F. Smith (Old Pleasant); large: 1, Mr & Mrs Wells (Doncaster); 2, Mr Strassman (Stander); 3, Mr A. Barnes (Cleveland); Best, small: 1, Mr H. Johnson (Purley); 2, Mr R. Alexander (Huddersfield); 3, Mr & Mrs Bishop (Ayr); Characin, large: 1, Mr R. Coyne (Hull); small: 1, Mr Thompson (Purley); 2, Mr & Mrs Liddell (Ashington); Characin, small: 1, Mr & Mrs Miles (Doncaster); 2, Mr A. Richardson (Houghton); 3, Mr R. Neworthy (Purley); Characin, large: 1, Mr L. Collins (Stockton); 2, Mr B. Cooper (Purley); 3, Mr & Mrs Jackson (Castleside); Cichlid, small: 1, Mr S. Cargill; 2, Mr J. Watson (Hartlepool); 3, Mr J. Furness; *Hepichromis dorsivittatus*: 1, Mr C. A. Light (Houghton); 2 & 3, Mr H. Hubbard.

Latecomer: 1, Mr & Mrs Miles; 2, Mr Johnson (Hartlepool); 3, Mr R. Thompson (Hull); *Poecilia splendens*: 1, Mr & Mrs Miles; 2, Mr J. Helms (Houghton); 3, Mr F. Coleman (Whitley Bay); LLTC: 1 & 2, Mr J. Robertson; 3, Mr M. Ruffell (Hull); *Coffin & South*: 1, Mr J. Gallipie (Castleside); 2, Mr & Mrs Miles; 3, Mr Thompson (Hull); *Corydoras & Albinos*: 1, Mr Thompson (Ashington); 2, Mr & Mrs Wells (Doncaster); 3, Mr & Mrs Liddle; *Neonoras danos & ramosus*: 1, Mr & Mrs Miles; 2, Mr Smith (Purley); 3, Mr W. Hall (Houghton); *Sharks & Rays* for sale: 1, Mr G. Greenly (Half Moon); 2, Mr W. Strath (Hull); 3, Mr Smith (Houghton); *Acc.*: 1, Mr Smith; 2, Mr P. Brown (Hartlepool); 3, Mr & Mrs Liddle; *Fish*, general: 1, Mr E. Williams (Houghton); 2, Mr & Mrs Sowerby (Old Pleasant); 3, Mr M. Furdell (Houghton); *Other*, miscellaneous: 1 & 2, Mr & Mrs McGee (Half Moon); 3, Mr R. Crossley (Purley); *Groups*: 1, Mr L. Collins; 2, Mr R. Sowerby; 3, Mr R. Alexander; *Specialist*: 1, Mr D. South (Ashington); 2, Mr & Mrs Parsons; 3, Mr R. Elliot (Stockton); *Spec.*: 1, Mr D. Smith; 2 & 3, Mr H. Strassman; *Sharks*: 1, Mr R. Neworthy; 2, Mr G. Brown (Old Pleasant); 3, Mr H. Hubbard.

Goldfish: 1, Mr & Mrs Dewart (Houghton); 2, Mr N. Bell (Blyth); 3, Mr & Mrs Furness; *Breeder's*, *agglens*: 1, Mr H. Hubbard; 2, Mr J. Watson; 3, Mr J. Latham; *Blue Moon*: *Breeder's*, *Spec.*: 1, Mr R. Cargill; 2, Mr R. Neworthy; 3, Mr H. Hubbard.

SEVERN SIDE ICHTHYOLOGICAL SOCIETY members enjoyed three meetings in March. The month started with a night of films and slides—an 8 mm. colour film made by member Mr G. Ralphs of his

home aquarium and fishes and a slide show on marines narrated by the Society's secretary Mr M. Pinches, which gave some very useful hints on marine fishkeeping. Mr Pinches gave further helpful hints and tips, this time on heating the aquarium, at the second meeting of the month. The Society were also able to enjoy at this meeting a crossword quiz devised by Mr M. Price. At the third meeting, members much enjoyed a slide and tape show given by Mr C. Price, show secretary of Wrexham AS on showing, on killifish and on marines. Society meetings in May are on the 11th and the 22th at the Labour Club, Abbey Foregate, Shrewsbury, and all are welcome.

NORTHWICH & DAS were hosts to Chester AS and Runcorn AS at the inter-society table show and quiz. The quiz was organised by Mr L. Bradley and the home team won this (2, Chester; 1, Runcorn). Judges of the table show entries were Mr K. Parks and Mr F. Mulla of Merseyside AS and Northwich were again successful with 48 points (2, Chester, 18; 1, Runcorn, 13). D. & L. Thorne entered the best fish in show, a golden ramirez. Details were:

Groups: 1, Mr R. Knowles (N, 78); 2, Mr S. Bishop-Jones (N, 74); 3, Mr P. Hall (R, 72); *Medals*: 1, Mr D. Walker (R, 79); 2, Mr R. Newton (R, 74); 3, Mr B. Yates (N, 73); *Characin, small*: 1, Mr B. Newport (N); 2, Mr R. Knowles (74); 3, D. & L. Thorne (N, 71); *Characin, large*: 1, Mr C. Bowyer (C, 74); 2, Mr J. Hall (R, 73); 3, Mr B. Yates (71); *Cichlid*: 1, L. & D. Thorne (69); 2, Mr R. Dutton (C, 70); 3, Mr P. Flood (N, 70); *Angels*: 1, Mr R. Adams (N, 78); 2, Mr L. Bradley (N, 74); *Fringed finned etc.*: 1, Mr D. Walker (77); 2, D. & L. Thorne (75); 3, Mr J. Hall (74); *Fighters*: 1, L. & D. Thorne (75); 2, Mr J. Hall (64); 3, Mr R. Dutton (68); *Anabantids*: 1, Mr R. Dutton (74); 2, Mr C. R. Bowyer (73); 3, Mr P. Wrooth (N, 71); *Breeder's agglens*: 1, L. & D. Thorne (75); 2, Mr R. Ralph (C, 71); 3, Mr P. Flood (74); *Livebearers*: 1 & 2, Mr R. Knowles (76, 71); 3, D. & L. Thorne (74); *Coldwater*: 1, L. & D. Thorne (77); 2, Mr H. Buckley (N, 74); 3, Mr J. Hall (72); *Furnished multi-der*: 1, L. & D. Thorne (74); 2, L. Bradley (73)

WELWYN GARDEN CITY AS members were fortunate to hear two fine lectures in March at their meeting place at The Scout Hut, Great Dell, Welwyn Garden City on the first and third Monday of the month. Mr Peter Bird's witty,

illustrated talk on killifish breeding and maintenance so stimulated the audience that numerous members of the Society took advantage of his generous gift of eggs to take up the challenge of keeping and breeding these fish. At the second meeting, a large gathering listened to the excellent talk by Mr John Harvey of 'Fins and Wings' on the fundamentals of tropical marine fishkeeping. Mr Harvey emphasised how the leap forward in knowledge of marine fishkeeping in recent years held hope that the breeding of tropical marines by aquarists in the not-too-distant future would substantially reduce the cost of this side of the hobby. Mr Harvey also stated that the conversion of suitable tanks for keeping tropical marines could be achieved at relatively low cost and that by careful and judicious buying of a correct selection of fish, very few, if any, expensive mistakes need be made.

For the future, the Society will be supporting 'Contax 73', the Welwyn Garden City Open Day in May and hoped to persuade more of the general public to join their ranks. An attempt to increase the interest in coldwater species in particular would be made. Later in the year the Society hoped to participate in the fishkeeping exhibition in July and in The Aquarium Show '73 (FBAS) where they intended that their entry in the tableaux section would 'emphasise the fish side of the hobby and avoid any elaborate model-making'.

DERBY REGENT AS were well pleased with the response to their Grand Aquarist Seminar held earlier this year. Over 250 aquarists attended and the Derby Playhouse theatre was well filled, though it was felt that rather more visitors might have been expected from northern societies. Lectures by Dr Neville Carrington of Interpet, by Mr Roy Skipper of the House of Fishes and by Mr Graham Cox of ScAquariums were of immense interest and some excellent films were shown on fish embryos, daphnia, plankton, the Great Barrier Reef and on the evolution of the enormous variety of physical characteristics and environmental behaviour in our fish. Perhaps the true recommendation should come from one of the audience, Mr G. R. Catchpole of Coventry Pool & AS. Describing the lectures in Coventry's Newsletter, he ends: 'The Seminar was very well organised and a most enjoyable day was had by all. The best of luck to Derby in any further ventures of this nature.'

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SPUN-GLASS SILK

A new record for **KEIGHLEY AS** was achieved at their fifth annual show held in March when 833 entries were received. Best in show trophy was awarded to Mr Thickbroom of Castleford as well as the AYAS Diploma, gold pin and section award; Mr D. Mosley won the award for the best exhibit by a Keighley member, and Aireborough DAS were the society gaining most points. Results as follows:

Guppies: 1, Mr D. Laycock (Sheffield, Lagoon Trophy); 2, Mr E. J. Brown (Bradford); 3, Master A. Kaye (Top Ten). **Swordtails:** 1, Master A. Kaye; 2, Mr & Mrs Nuttall (Middleton); 3, M. & D. Laycock (Sheffield). **Mollies:** 1, Mr Baker (Castleford); 2, Mr Leadbetter (Fleetwood); 3, Mr Beckenham (Oldham). **Platys:** 1, Mr C. Kaye (Top Ten); 2, Mr Leadbetter; 3, Mr A. Besley (Bury). **Nov Livebearers:** 1, Mr Leadbetter; 2, Mr Hall (Aireborough); 3, Mr P. Stanforth (Don Valley). **Barbs up to 100y:** 1, Mr & Mrs Wells (Doncaster); 2, Mr D. Moylan (Blakeborough); 3, Mr Parker (South Leeds). **Barbs over 100y:** 1, Mr & Mrs Cohen (Interpet trophy); 2, A. & C. Collinson (Aireborough); 3, Mr R. Jones (Castleford). **Characins up to and including bleeding hearts:** 1, M. & D. Laycock; 2, Mr M. Cook (Harrogate); 3, Mr Cartwright (Huddersfield). **Characins over bleeding hearts:** 1, B. & R. Backett (Society trophy for characins, Marnborough Bay); 2, Mr J. Whitley (Aireborough); 3, Mr & Mrs Mully (Ind). **Ranboras, danios, minnows:** 1, T. & C. Smith (Heap trophy, Sheffield); 2, Mr & Mrs Gilding (Gainsborough); 3, Mr C. Malpas (Castleford). **Sharks and flying foxes:** 1 & 2, Mr G. Thickbroom (Green-Hart trophy); 3, T. & C. Smith (Sheffield). **Fighters, true colour:** 1, Mr & Mrs Cohen; 2, Mr & Mrs Milne (Doncaster); 3, Mr A. Beasley (Bury). **Fighters, multi colour:** 1, Mr A. Churchin (Swillington); 2, Mr Hoop; 3, Mr Hall. **Anabantids (up to thicklip):** 1, Mr & Mrs Cohen (Hinds trophy); 2, Mr & Mrs F. Buxton (Aireborough); 3, Mr & Mrs Milne (Doncaster). **Anabantids over thicklip:** 1, Master A. Gregory (Nelson); 2, Mr C. Gray (Mount Pleasant); 3, Mr Hall. **Tooth-carn:** 1, Mr J. Whitley (Tingley Tropicals trophy); 2 & 3, Mr J. Mosley (Keighley). **Angel fish:** 1, Mr Wood (Horsforth); 2, Mr & Mrs Dickson (Gainsborough); 3, Mr Sumner (Sandgrounders). **Dwarf cichlids up to Arlebein:** 1, Mr J. Whitley; 2, Mr Leadbetter; 3, L. & P. Graham (E. Lancs.). **Cichlids over Arlebein:** 1, Mr Ormsbar (Seven Seas trophy, Sandgrounders); 2, Mr P. Grogan (Morecambe Bay); 3, Master A. S. Furness (Castleford). **Corydoras catfish:** 1, Mr Sumner (trophy, Sandgrounders); 2, D. & R. Standen (E. Lancs.); 3, Mr & Mrs Clark (Aireborough). **Loaches & botias:** 1, Mr & Mrs Morris (Eastburn Tropicals trophy, E. Lancs.); 2, Mr C. Beckenham; 3, Mr F. Robinson (Four Star). **Nov Catfish:** 1, Mr J. Baker (A. & O. Taylor trophy, Castleford); 2, Mr Carl (Worsley); 3, Mr Hall. **Nov Tropical:** 1, Mr G. Thickbroom (trophy); 2, Mr D. Rathoby (Keighley); 3, D. & R. Standen. **Breeders livebearers:** 1 & 2, Mr & Mrs Cohen (Exotic Aquaria trophy); 3, Mr E. Parks (Sheaf Valley). **Breeders egg-layers:** 1, Mr & Mrs Gilding (D. & J. Mosley trophy); 2, Mr & Mrs Burton; 3, Mr A. Churchin (Swillington). **Pairs livebearers:** 1, Mr C. Goodman (Sugar trophy); 2, Mr J. Whitley; 3, Mr G. Thickbroom. **Pairs egg-layers:** 1, Mr Leadbetter (Bottomley trophy); 2, Mr Ormsbar; 3, Mr Waterhouse. **Common goldfish:** 1, 2 & 3, Mr J. S. Hall. **Fancy goldfish:** 1 & 2, Mr J. S. Hall (Society trophy for coldwater); 3, Mr Whitley (Accrington). **Shubunkins:** 1, Mr J. S. Hall; 2 & 3, Mr C. H. Whitley. **Nov Coldwater:** 1, Mr D. Mosley; 2, L. & P. Graham; 3, Mr S. Wash (Accrington). **Juniors av cold-**

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water: 1, Miss Jones (Keighley); 2, Master Furness; 3, Master Barrett (Castleford). **Juniors av egg-layers:** 1, Master M. Holmes (Society trophy, best junior exhibit, Castleford); 2, Master Barrett; 3, Master Thickbroom. **Juniors av livebearers:** 1, Master Haptonstall (Castleford); 2, Master Marshalls (Oldham); 3, Miss Gregory (Nelson). **av Marines:** 1, Mr J. Hallam (Dingley Ladies trophy); 2, Mr Jones; 3, Mr Stewart (Aireborough).

MIR I. WOOD, present secretary of the FNAS gave a very well received talk on killies to the **MANCHESTER SECTION** of the **FGA**. Quite a number of FGA members, it was revealed, kept or have kept killies. There were 70 entries on the show bench: best exhibit and best female went to Mr D. Glenn's natural-tail female, Mr J. Hutchings from Lancaster took best male and best breeders awards with his double swords. The March meeting consisted of a symposium on foods and feeding from the Manchester Section Management, the star turn of which was Mr F. Campbell, who gave a demonstration of how to make your own dry food. On the table show best exhibit and best male went to Mr A. Charlton's top sword, best female to Mr P. Young's natural tail female and best breeders to Mr J. Hutchings's team of double swords.

In **FEM**, March, it was incorrectly stated that the monthly meeting day was the second Sunday of the month; it is in fact the first Sunday of the month, 2.30 p.m., at the Longsight Hotel (rear entrance, Belle Vue), Manchester.

BASINGSTOKE AS have enjoyed an extremely interesting programme of talks recently by Mr J. V. Morrice on 'Aquariums for Beginners', by Mr D. Mills of Ealing AS on 'Filters and Filtration' and by Mr R. Fleece of Lynchford Aquatics on the care of marines. Class winners at recent table shows have been: platys, Mr I. Winters; nov, Mr J. Jackson; novice, Mr R. Onslow; killies, Mr A. Blake; nov Mr J. Jackson; novice, Mr P. Ronald; labyrinth, Mr T. Taylor; nov, Mr T. Taylor; novice, Mr A. Marshall. John Jackson and Antony Marshall were promoted from the Novices.

MIR L. J. DIXON, P.R.O. of **REIGATE & REDHILL AS**, reports: 'A long term programme of activities has been formulated, and at

the annual auction the Society was pleased to welcome a very large number of new faces. At the following meeting, again very well attended, an old friend from Mid-Sussex, Mr J. Burtles, gave a talk on botias and loaches, an instructive and well prepared lecture very much enjoyed by members. At the table show, too, a greatly increased number of entries were received for the annual Club Cup competitions. Winners were: Live Bearer Breeders Cup, Mr Davey; Egg Layers Breeders Cup, Mr K. Norris; Corydoras Cup and Fighter Cup, Mr J. Wood; Characin Class, Chris Thorpe. It is expected that now a new, pleasant and more permanent meeting place has been found at the East Surrey Spastics Society Hall, Frenches Road, Redhill, Surrey, the Society is set for an encouraging and interesting future.

WREXHAM TFS members had two very enjoyable evenings recently. At one, a talk on all-glass tank-making was given by Mr J. Pound and members were encouraged to try glass cutting themselves. After this a slide show on open shows and furnished aquaria was shown. At the second meeting, Mr R. Mathers gave a talk on breeding fighters, including foods and feeding, that turned out to be very witty and occasioned lots of laughter from members. The table show was won by Miss V. Jones with a cherry barb which was awarded 88 points (2 & 3, Mr R. Mathers, 87 and 86 points). Highest pointed junior was Master S. Lewis who received 82 points for a tiger barb. A bring-and-buy sale was also held that turned into a side-splitter; after which, to try and restore order, a slide quiz arranged by Mr C. Pritchard was held. This was won by Mr F. Oliver but this also turned out to be a laughter maker. All in all, members left with light hearts and aching sides.

RESULTS of the first table show in the **BIRMINGHAM SECTION** of the **FGA** Points Cup trophy competition, were: 1, Mr W. Ewart (Radford Semely, 19); 2, Vowles and Vinal (South London, 16); 3, Mr M. Delingpole (Alvechurch, 12); 4, Mr G. Fletcher (Pelsall, 11). At this meeting the major honours went to Mr M. Delingpole with best male; best opposite sex, Mr G. Steadman; best breeder, best in show to Mr T. Smith for a team of breeders pairs. P.R.O., Mr A. C. J. Truman, continues: 'It is always most pleasing when one of our newer club members wins a card award. This month, Mr R. Francis, who travelled from South Wales to be present at the table show, took third place in the delta

... NEXT meeting of **HARTLEPOOL AS** will be on 7th May, 8.0 p.m., the Travellers Rest Hotel. New members are most welcome.

class. This class is considered by many experts to be a most difficult section for the beginner to succeed in. On Sunday, 27th May, most of the leading guppy breeders in the country meet at Stechford, Birmingham, to compete in the FGA World International. We extend a warm welcome after 3 p.m. to all those enthusiasts who are interested in good standard shaped guppies and their beautiful colours. We meet on the fourth Sunday afternoon of each month at Gleebe Farm Community Centre, Stechford, Birmingham.

At the **ROTHERHAM & DAS** open show, Best Fish in the Show was an angel owned by E. Kirk & Sons of Grimsby AS. There were 880 entries and results are as follows:

Plants: 1, H. & M. Buxton (Sheffield); 2, Mr & Mrs Baker (Crosswell); 3, Mr P. A. Hove (Blitchley). Mosses: 1, Mr P. Baker (Welbeck, section winner); 2, Mr & Mrs Williamson (Cottingham); 3, Miss S. Clark (Aireborough). Swords: 1, Miss S. Clark; 2, Mr P. J. Whelan (Acrofton); 3, Mr C. Beckwith (Oldham). Guppies: 1 & 2, E. Kirk & Sons; 3, Mr L. Leadbeter (Huddersfield, see Livebearer); 4 & 5, Mr F. Southworth (Don Valley); 6, Mr J. N. Hall (Aireborough). Small fishes: 1, Mr & Mrs Wells (Doncaster); 2, Mr & Mrs Gillies (Doncaster); 3, Mr M. Richardson (York). Large fishes: 1, Mr & Mrs Cohen (Oyston, section winner); 2, Mr R. Jones (Huddersfield); 3, Mr D. Bewell (Sheffwood). Small characters: 1, Mr & D. Laycock (Sheffield); 2, Mr & Mrs Harris (Gainsborough); 3, Mr G. Gillespie (Castleford). Large characters: 1, Mr & Mrs Stanton (Sheffield, section winner); 2, Mr Thickson; 3, Mr S. Clark (Aireborough). at Tenthredin: 1, Mr N. Carr (Doncaster, section winner); 2, Mr & Mrs Smith (Sheffield); 3, Mr J. Walker (Rotherham). Swords & Mosses: 1, Mr Thickson, section winner; 2, Mr T. Smith (Sheffield); 3, Mr & Mrs Clarke (Aireborough). Cuckoos: 1, Mr P. Baker (Welbeck); 2 & 3, Mr P. A. Hove (Blitchley, see Carfish); 4, Mr & Mrs Kibington (Doncaster); 5, Mr C. Pugh (Sheffwood); 6, Mr T. Rodgers (Rotherham). Louches: 1, Mr H. Marshall (Oldham); 2, Mrs Walker (Crosswell); 3, Mr C. Beckwith (Oldham). Rasbora, section winner: 1, Mr & Mrs Wells (Doncaster, section winner); 2, Mr A. Moss (Huddersfield); 3, Mr T. Smith (Sheffield). Dwarf cichlids: 1 & 2, Mr L. Leadbeter (Huddersfield); 3, Mr P. A. Hove. Large cichlids: 1, Mr R. Neight (Rotherham); 2, Mr J. Farness (Castleford); 3, Mr D. L. Whitwell (Blackpool). Angels: 1, E. Kirk & Sons; 2, Mrs Harrison (Rotherham); 3, Mr & Mrs P. Hall (Crosswell). Fishbowls: 1, Mr Jackson (Worsley); 2, Mr & Mrs Hove (Grimsby); 3, Mr G. Gillespie (Castleford, see Anabantid); 4, Mr & Mrs P. Hove (Aireborough, section winner); 5, Mr & Mrs Cohen; 6, Mr J. Salisbury (Sheffwood, see Tropical); 7, Mr Thickson (section winner); 8, Mrs A. Barris (Castleford); 9, Mr H. Marshall.

Arowana and Arapaima at Home

THE lecture given by Dr David Scott of St Andrews University on the Bony Tongued Fishes of Asia and America provided a most entertaining afternoon for the many visitors and members of **THE BRITISH AQUARIST STUDY SOCIETY** when BASS held its first meeting of the year at the London Zoo. Dr Scott showed films of two expeditions made by himself with his family to Asia and South America, to collect and study the osteoglossids *Scleropages*, *Osteoglossum* (arowana) and *Arapaima*.

Dr Scott explained that his primary interest in the reproduction of fishes from the economic standpoint of fish-farming and in particular the part played by the pituitary gland had led him to look at the osteoglossids, species that produce very large eggs. Their night-time habits presented special problems in their capture, which in general could be effected only by native spear fishermen from boats. Members and guests at the meeting were able to visit the Aquarium and see behind the scenes.

MEMBERS and guests of **WALTHAMSTOW & DAS** greatly enjoyed a talk by Mr David Marlborough of the BIS on native freshwater fishes in aquaria. A social evening is planned for 16th May at the Grange Community Centre, Frederik Street, Walthamstow, London, E17 when members from other societies and guests will be welcomed.

Mr Ken Lee received the awards for best swordtail (double sword) and best shorttail (lyretail). Best male award, Mr George Steadman; best female, Mr Alf James; best breeders, Mr & Mrs Don Phillimore, who also received the award for the best exhibit.

Breeder livebearers: 1, Mr T. Douglas (Hull, section winner); 2, Mr A. Bellamy (N/S); 3, Mr G. Andrews (Hull). Breeder egglayers: 1, Mr & Mrs F. Buxton; 2, Mr & Mrs Gabe; 3, Mr D. J. Whittside. Fairy livebearers: 1, Mr G. Goodman (Oldham, section winner); 2, Mr J. Lyle (Sheffwood); 3, Mr J. Part (Blackburn). Paris egglayers: 1, Mr & Mrs Arvold (Gainsborough); 2, Mr D. Foster (Don Valley); 3, Mr & Mrs Harris (Gainsborough). Goldfish & comets: 1 & 2, Mr J. S. Hall (Sheffwood); 3 & 4, Mr J. R. Hall; 5, Mr Eddington (Rotherham). Fancy goldfish: 1 & 2, Mr J. S. Hall (section winner), see Goldwater; 3 & 4, Mr J. S. Hall; 5, Master C. Pratt (Bedworth). Mini-jaws: 1, Mr J. Robertson (Mount Pleasant); 2, Mr R. Haslow (Darby Road); 3, Mr & Mrs Gabe. Plants: 1 & 2, Mr Kibington (section winner, Doncaster).

HORSFORTH & DAS held its annual members' show in the Mechanics Institute, Town St., Horsforth. Will new members note that this was the last event to be held by the Society at this venue. The new headquarters will be The New Civic Hall, Stanningley Rd., Pudsey, and meetings will be in the Green Room the first Tuesday in each month. Members' show results were:

Barbs: 1, Mr C. Corra; 2, Mr P. J. Smith; catfish and loach: 1, Mr P. J. Smith; danies: 1, Mr C. Corra; 2, Mr M. Gornall; juniors: 1, Master Gornall; 2, Master Holdsworth; anabantids: 1, Mr C. Corra; 2, Mr J. Woods; 3, Mr P. J. Smith; cichlids: 1, Mr J. Woods; 2, Mr & Mrs Robertson; livebearers: 1, Mr Durr; 2, Mr Gornall; parrot: 1, Mr J. Woods; 2, Mr P. J. Smith; 3, Mrs J. Dickinson.

Best in Show was Mr J. Wood's marble angel. The entries were judged by Miss J. Helen.

THE Spring Open Show of the **EDMONTON SECTION** of the FGA attracted many members from Birmingham and beyond. There were 25 fine class trophies to be won plus three rose bowls and an extra prize for the best exhibit in the show—a Tom Tiffany oil painting of some value. Altogether, it is reported, it was a very enjoyable afternoon made successful by all the members of the Section who helped to run the various activities.

IT is reported by Mr J. Collins that **'HEMEL HEMPSTEAD AS** listened to a very interesting lecture about anaesthetising fish, given by one of our own club members, Mr A. Tuffs, and we would like to thank him for an enjoyable evening. Another good evening was the showing of the Jacques Cousteau film "World without Sun"; we invited people from several other clubs and would like to thank all those who attended for making our meeting successful. One of our members is cutting down on his stock so another meeting was spent suctioning some of this to club members. For information regarding the Society please contact Mr J. Collins at Hemel Hempstead 4449'.

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In Brief . . .

... YET another hazard to obtaining speakers at club meetings has been reported by the P.R.O. of **SOUTH-END, LEIGH & DAS**. When the Society were hosts to the East London, Thurrock and North Kent societies for the first round of the 1973 inter-club series, their visiting speaker, Mr Morris, was unable to attend 'as he was trapped at his place of work by an anti-social computer'. At the end of this round Thurrock had 27 points (Southend 14, N. Kent 6, East London 3). Best fish in the show was a *Corydoras* (81 pts) belonging to Mr P. O'Brian of Thurrock.

... 63 requests for application forms in the last couple of months have boosted the **BRITISH MARINE AQUARISTS' ASSOCIATION** membership to over 300.

... MR Roger Whittington of the GSGB recently imparted some of his extensive knowledge on the subject of preparing goldfish for the breeding season to the delighted members of **SOUTH PARK AQUATIC (STUDY) SOCIETY**. The table show for native and foreign fish was won by Mrs M. Dudley, who took 1st and 2nd with golden rudd and black-banded bass; Mr G.

Herring took 3rd, 4th and consolation cards with his golden medaka and two gudgeon. The May meeting (15th) will include a talk by Mr R. Dodkins on filtration and a table show for twintails.

... MR G. R. Catchpole of **COVENTRY POOL & AS** proposed a resolution at the Seminar held in January by Derby Regent AS that the governing body of the Seminar should request the **WATCH** Consumer's Advisory Service to conduct a series of comparative tests of air pumps and other aquarium equipment in view of 'their over-pricing and poor manufacture'. The resolution was seconded by Mr T. Parry, chairman of Loughborough & DAS, and passed for action.

... A SLIDE show and talk by Mr Ralph Tedds on anabantids provided members of **LEAMINGTON & DAS** with some very useful advice on breeding and sexing this species. The Society have also enjoyed a lecture by Mr Matthews about preparing fish for the show bench. Class winners at recent table shows have been: aov, Mr D. Hawkins (butterfly fish, 71 pts); guppies, Mrs D. Hawkins (72); characins, Mr T. Dobson (red-eyed tetra, 73); barbs, Mr B. Chittenden (rosy barb, 72).

... THE tank that won the **TORBAY AS** home furnished aquaria competition belonging to Mr Mitchellmore included a pair of thick-lips

that had a brood of young in one corner (2, Mr Sparks; 3, Mr Denning). Reports now reach us of one of the Society's 'Star' nights when Mr Leslie Jackman of the Aquarium, Harbour Side, Paignton, who also assists the Natural History Unit of the BBC at Bristol in making films of the sea shore, entertained members to a film night; this included a film about the first marine aquarist, Mr Henry Goss, who lived at Torquay about 130 years ago and under whose guidance the London Zoo started their Aquarium.

... 31 good entries at the March table show and discussion meeting held by **BRISTOL AS** (13 coldwater and 18 tropical) made the task of judge Mr E. Newman a difficult one. After the interval Mr Newman answered many questions about the hobby. Class winners were: guppies, Mr M. Howe; cichlids: 1, Mr E. Bowden; 2 & 3, Mr D. Saphier; characins: 1, Miss Morgan; 2, Mr E. Bowden; goldfish: 1 & 2, Mr W. Ham; 3, Mr S. Lloyd; orandas: 1 & 2, Mr S. Lloyd; fantails: 1, 2 & 3, Mr S. Lloyd.

... WHEN **NEWBURY & DAS** entertained **READING & DAS** to a 12-a-side a.v. plus breeders' team match the home side won by 15 points to 10. FBAS judge Mr Maurice Carter gave the following points: 1, Mr C. Dixon (N, 80); 2, Mr D. Eaton (R, 79); 3, Mr P.

Meetings and Changes of Officers

ASHINGTON & DAS. Secretary, Mr H. Kennard (8 Tosson Place, Ashington, Northumberland, NE63 9LG).

BOROUGH AS. Chairman, Mr P. Loughran; secretary, Mr E. Callaghan (4 South Hill Park, Booterstown Avenue, Blackrock, Co. Dublin; phone 880496); assistant, Miss J. Moran; treasurer, Mr D. Mayberry; P.R.O., Mr N. E. Larkin (12 Mather Rd North, Mount Merrion, Co. Dublin). New members always welcome. Meetings: 2nd Wednesday of month, 8.00 p.m., The Carney Arms Hotel.

BRADFORD & DAS. President, Mr W. Holmes; treasurer, Mr E. J. Brown; secretary, Mr J. Cavithra (74 Hastings Avenue, Bradford, BD5 9PP). Meetings: 1st Wednesday of month, 7.45 p.m., Unity Hall, Rawson Square, Bradford. Newcomers welcome to attend without being asked to join.

BRISTOL TFC. New secretary, Mr L. J. Hudd (64 Kingston Road, Southville, Bristol).

CORRINGHAM & DAS. New Society. Advertising officer, Mr D. Eaton (13 Carisbrook Drive, Corringham, Essex). Meetings: 1st and 3rd Wednesday of month, The Community Centre, Corringham Road, Stamford-le-Hope.

FANCY GUPPY ASSOCIATION, MANCHESTER SECTION. Meetings: 1st Sunday of month, 2.30 p.m., Longsight Hotel (rear entrance to Belle Vue), Manchester.

GOSPORT & DAS. New Secretary, Miss K. Howell (14 Long Drive, Rowley, Gosport, Hants.; phone Fareham 851663).

HORSFORTH AS. New name, **HORSFORTH & DISTRICT A.S.** New venue: The New Civic Hall, Stanningley Road, Pudsey. Secretary: Mr P. J. Smith (10 Wynford Rise, Leeds, 16; phone Leeds 675712). Meetings: the Green Room, 1st Tuesday in month, 8.00 p.m. New members welcome.

MIDLAND AQUARIUM AND POOL SOCIETY. Chairman, Mr A. Aldridge; chairman elect, Mr A. Roberts; secretary, Mr C. W. Davies (8 Redhill Road, West Heath, Birmingham, B31 3LD); treasurer, Mr S. Green; newsletter editor, Mrs J. Cooper (3 Yew Tree Road, Edgbaston, Birmingham). Meetings: 3rd Thursday of month, Room 5 at the Ladywood Community Centre, Ladywood Close, Ladywood, Birmingham. Visitors and new members always welcome.

PONTEFRAC T & DAS. Chairman, Mr B. Nock; secretary, Mr B. Stevens (72 Falcon Drive, Love Lane, Castleford, Yorks).

Meetings: 1st Wednesday in month, 8.00 p.m., Willow Park Hotel, Pontefract. New members welcome.

PRIVATEERS AS. President, Mr E. Bowers; vice president, Mr B. Merrill; treasurer, Mr R. Stein; public relations and equipment officer, Mr A. Payne; secretary, Mr F. W. Coles (18 South Hill Drive, Giltspur, Bingley, Yorks, BD16 3NR); show secretary, Mr R. Whitaker (4 Birklands Terrace, Shipley, Yorkshire).

REIGATE & REDHILL AS. President, Mr K. Fawcett; vice presidents, Mr B. Canacott and Mr B. Leach; chairman, Mr M. Uden; vice-chairman, Mr B. Young; secretary, Mr J. Wood (22 Rickman Hill, Coulsdon, Surrey). New venue, East Surrey Spastics Society Hall, Frenches Road, Redhill, Surrey.

THORNE AS. Chairman, Mr M. Curtis; treasurer, Mr H. Candow; secretary, Mr B. Banks (40 Warren Road, South Common, Thorne, Nr. Doncaster, Yorks, DN8 5PP). New venue: Green Top School, South Common, Thorne. Meetings, Thursdays, 7.30 p.m.

UNBRIDGE & DAS. New venue: Brookside Pavilion, Brookside Road, Hazen, Middlesex, from Wednesday 11th April and thereafter on alternate Wednesdays at 8.00 p.m. New members welcome.

WREXHAM TROPICAL FISH SOCIETY. Meetings: second and last Thursday each month, Fellowship Hall, Bradley Road, Wrexham.

Lagg (N, 78). Breeders' team: Mr C. Dixon (N, 78); Mr A. Green (N, 77). A light-hearted quiz held during the judging resulted in a further, if rather more dubious win for Newbury.

... **AT BILLINGHAM AS** March meetings show results were: sharks and labios: 1, Mr A. Crossley; 2 & 3, Mr & Mrs Anderson; catfish & loaches: 1, Mr Q. Watt; 2 & 3, Mr J. Ryan.

... **MR P. Moorhouse** of Huddersfield gave an interesting lecture on 'Keeping Marine Fish' to **KEIGHLEY AS**, and showed films of various marine fish spawning. Mr L. Jackson won in the fish of the month (cichlids) class. Other class winners were: nov, Mr J. Bottomley; novice nov, Mr J. Ibbotson; junior nov, Master A. Hollingsworth.

... A **SLIDE** show on cichlids was the main event of the March meeting of **WEYMOUTH AS** and 44 members and two new members were also able to see again the slides of last year's open show. Both the nov catfish, and *Corydoras* & *Breithia* classes in the table show (judge, Mr A. Cox) were led by Mr K. Forrester.

... **TABLE** show class winners among **STOCKTON AS** members have been: catfish: 1 & 2, Mr K. Connolly; 3, Mr A. Saunders; nov/nov, 1, 2 & 3, Mr Q. Watt.

... **CHANGE** of date for **THORNE AS** Open Show. Owing to a clash of dates Thorne AS have decided to change their date from 1st July to 2nd September.

... '**CORYDORAS** Catfish' was the title of the lecture given by Mr B. Corwell to **BRISTOL TROPICAL FISH CLUB**. Also held was the first of this year's table shows, the class being catfish & loaches and the winners: Mr N. Gray (Open) and Mr K. Gray (Novice).

... **MEMBERS** of **BRIGHTON & SOUTHERN AS** greatly enjoyed a talk and slide show given by Dr Neville Carrington about his recent visit to the Far East. Mr C. West (FRAS) judged the table show: D: 1 & 3, Mr & Mrs Feek; 2, Mr & Mrs Corbin. Db: 1, Mr H. Maddison; 2, Mr & Mrs Feek; 3, Mr & Mrs Corbin.

... A **TALK** by Mr P. Hempson on setting up a marine aquarium provided **WISBECH & DAS** members with much helpful information. Table show winners were: 1, Mr Moss (salfin millie); 2, Mr Edwards (madras cichlid); 3, Mr Goodale (golden barb). Club members themselves provided the interest at the next meeting when at very short notice the scheduled lecture was

cancelled. Mr Edwards stepped in and gave a talk about cichlids. Mr Handley gave a talk on gouramis and Mrs Hooks gave a short talk on breeding egg-laying toothcarps. The winners on the cichlid bench show were: 1 & 2, Mr Handley; 3, Mr Moss.

... 28 keen fishkeepers met at the Community Centre, Stanford-le-Hope on Friday, 9th March to form the **CORRINGHAM & DAS**. Club meetings are held at the Community Centre, Corringham Road, Stanford-le-Hope on the 1st and 3rd Wednes-

day in the month. The club will welcome any keen aquarist or persons just wishing to learn with them about the fascinating hobby of fishkeeping.

... **BOROUGH AS** (Co. Dublin) held a hugely successful raffle of equipment and fish at their AGM to celebrate their first birthday. At the March meeting, as well as the usual drinks, chat, swap, buy and sell, a quiz slide show was held and members had to identify the slides/fish, and the winner received a medal.

Dates for Your Diary

5th May. **ROEHAMPTON AS**. Open Show. Roehampton Bora Club, Holybourne Avenue, Alton West Estate, Roehampton, London, SW14. Details: Mr D. Lamborne, 7 Whaler Court, Plough Road, London, SW11 1AX; phone 07-223 4938.

6th May. **MIDLAND ASSOCIATION OF AQUARISTS SOCIETIES** Inter-Society Show. Direction Manser Park. Details: Mrs D. A. Roberts, 28 Charles Road, Solihull, Warks B31 1TS.

6th May. **OSRAM AS** Open Show. Osram Recreation Hall, Refuge Street, Show, Oldham, Lancs.

12th May. **PORT TALBOT & DAS** Open Show. YMCA, Port Talbot. Show secretary: Mr A. E. B. Emrys, 1 Cross Street, Valletta, Port Talbot, Glamorgan, SA11 1AZ.

12th May. **GLOUCESTER AS** and Open Show. Gloucester Education and Leisure Centre, Paternock Road, Gloucester. Schedules: Mr M. Irocia, 114 Melbourn Street, Gloucester from February on.

13th May. **CROYDON AS** Open Show. Sir Phillip Games Recreation Centre, Moorland Avenue, Croydon, Surrey. Schedules: Mr D. Smith, 3 Handland Way, Wallington, Surrey.

13th May. **CORBY & DAS** Open Show. Corby Civic Centre, FRAS rules. Schedules: Mr A. Slow, 176 King Street, Kettering, Northants.

13th May. **DERBY REGENT AS** Open Show. Sherwood Foresters Recreation Centre (Normanton Barracks), Gossaston Road (A5114) Derby, RAC registered. Show secretary: Mr R. G. Harlow, 280 Mansfield Road, Derby; phone 44322.

17th-18th May. **SECOND NATIONAL WELSH** Open Show. The Central Hall, Tonypandy, Rhondda. Booking 17th May 12.30 p.m. to 12.30 p.m., 18th May. Details: Mr M. Williams, 222 Top Trebanog, Trebanog, Rhondda, Glamorgan.

19th May. **SOUTHEND, LEIGH & DAS** Open Show. St Clements Hall, Rectory Green, Leigh-on-Sea. Schedules from Mr D. C. M. Durnett, 172 Trinity Road, Southend-on-Sea, Essex; phone Southend 612376.

20th May. **KETTERING AS** Open Show. St John's Ambulance Centre, Fuller Street, Kettering. Booking: 11.00-2.00 p.m., FRAS rules. Schedules: Mr R. Vickers, 141 St John's Road, Kettering, Northants.

20th May. **MERSEYSIDE AS** Open Show. British Legion Hall, Crammond Avenue, Liverpool. Details: Mr Brian Hall, 122A Houghsidge Way, Catted Farm, Liverpool L26.

20th May. **YEOVIL & DAS** Open Show. The School Hall, Church Street, Martock, nr Yeovil. Schedules: Mr M. Hulbert, 62 Meadow Road, Yeovil, Somerset.

26th-27th May. **TOTTENHAM & DAS** Open Show. Old Drill Hall, High Road, Tottenham, London, N17. Schedules: Mr K. Nutt, 99 The Avenue, Tottenham, London, N17.

27th May. **MID-SUSSEX AS** Annual Fishkeeping Exhibition. (Non-competitive.) The Park Centre, Burgess Hill, Sussex.

27th May. **MIDDLETON & DAS** Open Show. Details: Mr R. Forsyth, 61 Sandy Lane, Middleton, nr. Manchester.

27th May. **WEYMOUTH AS** Open Show. Small Sidney Hall, Weymouth. Details: Mr A. C. Worth, 67 Queens Avenue, Dorchester.

27th May. **FANCY GUPPY ASSOCIATION WORLD INTERNATIONAL**. Globe Farm Community Centre, Stockford, Birmingham. Open to public: 12.00 p.m. Schedules: Mr D. R. Beaumont, 17 Peddars Close, Woodrow South, Redditch, Warks.

27th May. **BOSTON AS** Open Show. Blackhears Theatre, Boston. Schedules: Mr S. Noble, 175 Wood Farm Road, Boston, Lincs.

2nd June. **FRAS** Assembly. Conway Hall, Red Lion Square, London, WC1, 2.30 p.m.

2nd June. **BRISTOL AERO AS** Open Show. Wesleyan Church Hall, Brunel Hill, St George, Bristol. Schedules: Mr G. A. Sprake, 134 Yew Tree Drive, Kingswood, Bristol, BS21 4UF (phone: 635998).

2nd June. **ACCRINGTON AS** Open Show. St John's Ambulance Drill Hall, Bull Bridge, Accrington. Schedules: Mr S. Walsh, 123 Lammack Road, Blackburn, Lancs.

2nd June. **LOUGHBOROUGH & DAS** Open Show. The Sports Centre, Grandy Street, Loughborough. Schedules: Mr L. Purdy, 12 Cleveland Road, Loughborough, LE11 2SP; phone Loughborough 51712.

2nd June. **BOURNEMOUTH AS** Open Show. Kinon Community Centre, Fellama Park, Bournemouth. Details: Mr J. V. Jeffrey, 30 Breamer Avenue, Southbourne, Bournemouth, BH6 4JP.

2nd June. **SUDBURY AQUATIC CLUB** First Open Show. St Andrew's Church Hall, Harrow Road, Wensley, Middlesex. Schedules: Mr L. Brazier, 56 Ormsby Way, Kewton, Middlesex.

9th June. **HAVANT & DAS** 3rd Open Show, St George's Hall, Waterlooville. Details: Mr V. B. Hunt, Craglan, 120 London Road, Witley, 10, Portsmouth, Hants.

9th June. **VAUXHALL MOTORS** AS Open Show. Details: Mr A. Philps, 13 Hildesbach Road, Luton, Beds.

9th June. **LLANTWIT MAJOR** AS Open Show. Show secretary: Mr J. Edwards. Glanrafon Mill Park, Llanidloes, Cwmbridge, Glam.

10th June. **HIGH WYCOMBE** AS Open Show, The Lane End Village Hall. Details later.

10th June. **GKN FOND & AS** Open Show. GKN Cantons, Salisbury Street, Durham, Staffs. Details: Mr Roy Rowley, 125 Wolverhampton Street, Dursley, Staffs.

10th June. **LINCOLN & DAS** Open Show, Drill Hall, Broadgate, Lincoln. Details: Mr H. Johns, 44 Scarce Street, Lincoln (phone: 22111).

10th June. **CHELMSLEY** AS Open Show. Details: Mr B. J. Hooley, 2 Lanesdale Close, Colindale, Birmingham B40 7DS.

10th June. **BISHOPS CLEEVE** AS Open Show. T.A. Centre, Arle Road, Cheltenham, Glos. Schedule: Mrs J. Hordley, 44 Barton Street, Cheltenham, Glos.

10th June. **SALISBURY & DAS** Open Show, The City Hall, Fisherton Street, Salisbury.

10th June. **NORTHWICH & DAS** Open Show, Hartford Secondary Boys School, Chester Road, Hartford, Northwich, Cheshire. Mrs D. J. Thomas, 28 Winton Road, Wintford, Cheshire, phone Wintford 1286.

10th June. **FANCY GUPPY ASSOCIATION, LANCASTER SECTION** Open Show, Giggles Inn, Moss Lane, Lancaster. Details: Mr J. F. Park, 1 Bridge Street, Bala, Lancaster.

10th June. **FREELANCE** AS Open Show. Amersham Community Centre, Dunlop Street, London, S.E.27. Details: Mr J. Sorey, 72 Richmond House, Lane Street, Borough, S.E.1.

10th June. **SWILLINGTON** AS Open Show, John Swainson School, 66 Barwick Road, Leeds 14. Show secretary: Mr K. Stanley, 20 Goodwood Avenue, Keppel, 10 Leeds, Yorks.

10th June. **DUNSMOW & DAS** Open Show, Fookes Memorial Hall, Green Dunsdown, Essex. Details: Mr D. McMurrie, 77 Chapel Road, Harro, 10 Brentford, Essex.

10th June. **DUDLEY & DAS** First Open Show. Blind Institute, Wolverhampton Road East, Sedgley, Dudley. Judging by FRAS Rules. Schedule 4th to Mr M. A. Hickman, Crad-Lea, 20 Ludbrook Grove, Lower Gornal, Dudley, DY1 2LT, Worcs.

10th June. **GOSFORD & DAS** 7th Open Show, Seabrook Community Centre, Seabrook, Hants. FRAS Rules. Details:

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10th June. **ALFRETON & DAS** Open Show, Adult Education Centre, Albion Hall, Alfreton. Details: Mr B. Hickling, Parkview, 13 Copples Drive, Eastwood, NG16 2PA (phone: Langley 541 1224).

10th-10th June. **BRISTOL TFC** Open Show, Congregational Hall, Brindford Road, Bristol. Schedule: Mr V. A. Coggins, 28 Lougham Road, Southville, Bristol.

10th June. **BASINGTORE & DAS** Open Show, Carnival Hall, Basingstoke. Schedule: Mr B. Rich, 61 Pickers Road, Basingstoke, Hants.

10th July. **CHELMSLEY** AS Open Show. Details: Mr B. J. Hooley, 2 Lanesdale Close, Colindale, Birmingham B40 7DS.

10th July. **EXETER & DAS** Open Show, Kenford Village Hall, Kenford, nr Exeter. Details: Mr A. J. Wainwright, 28 Mar Street, Exeter, EX4 2LL.

10th July. **BORHAMWOOD & DAS** 1st Aquarists and Fishkeepers Aquaria Festival. Schedule: Mr D. J. Crockett, 24 Milton Drive, Borehamwood, Herts, WD8 2BB.

10th July. **GNGB** Quarterly Meeting. Curvey Hall, Red Lion Square, Holburn, London, 2.30 p.m.

10th-10th July. **BOMFORD & BEACON-TREE** AS Open Show, (Dispersed Team Open Show) Central Park, Dingham, Essex. Details: Mr D. G. Kerr, 74 Lovewood Drive, Collier Row, Romford, Essex, RM2 2QF, phone Romford 97604.

10th July. **BILLINGHAM** AS Open Show. Amended Date. Billingham Community Centre, Billingham Town Centre. Schedule (10th-10th): Mr J. Arroll, 24 Hatfield Place, Peterlee, Co. Durham (phone 4181) or Mr A. Crowder, 32 Blackwell Road, Billingham.

10th July. **OLDHAM & DAS** Open Show, Werneth Park, Oldham. Schedule (10th-10th): Mr E. Birchwood, 10 Inverness Avenue, Bickers, Manchester 9.

10th-10th August. **PORTSMOUTH** AS Open Show, St Patrick's Hall, Water Road, Southampton, Portsmouth. Setting up Saturday 4th August; judging 10h; open to the public Monday 10h to Saturday 12th. Schedule: Mr J. Stoddell, 24 Salcombe Avenue, Copnor, Portsmouth, Hants, PO2 6LD.

10th August. **TONBRIDGE & DAS** Open Show, Tonbridge School, Tonbridge, Kent. Schedule: Mr J. T. Matheson, 11 Northing Way, Five-Oak Green, Tonbridge, Kent.

10th August. **BLACKPOOL & FYLDE** AS Open Show, The Northbrook Castle Hotel, Northbrook, nr Blackpool.

10th August. **NORTH STAFFS** AS Open Show, Coleridge Drill Hall, Waterloo Road, Coleridge, Stoke-on-Trent, F.N.A.S. Rules. Details: Mr K. Arkley, 4 Castle Street, Chatterton, phone 720 86400, or Mr L. B. Booth, 275 Beverley Drive, Burnley, BB10 2JY, phone 221-124 2074.

10th-10th August. **MIDLAND OPEN SHOW (MAPS)** Bagley Hall, Broad Street, Birmingham. Details: Mr T. Green, 40 Fern Street, Witton Green, Birmingham, 15, phone 221-124 2074.

10th-10th August. **HARWICH & DAS** Open Show, The Queens Hotel, Domesday, High Street, Harwich. Details: Mr A. Gentry, 14 The Ridgeway, Domesday, Essex, CO12 4AU.

10th August. **STROUD & DAS** Open Show, Technical College, Stroud Road, Stroud. Schedule: Mrs D. Cole, Aquarist, The Hill, Stroudville, Stroud, Glos, GL8 2JH (phone: Stroud 4394).

10th August. **HUDDESFIELD TFC** Open Show. Details to follow.

10th August. **FLEETWOOD** AS first Open Show, Fleetwood Grammar School. Details: Mr N. West, 428 Montebary Road, Fleetwood, phone FWD 1072.

10th September. **FRAS** Assembly, Curvey Hall, Red Lion Square, London, WC1, 4.30 p.m.

10th September. **THORNE** AS Open Show. Details: Mr B. Banks, 41 Warren Road, South Common, Thorne, Doncaster.

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22nd September, **BETHNAL GREEN AS** Open Show, Bethnal Green Institute, 229 Bethnal Green Road, London, E.2. P.B.55 Supreme Clomplimentary Trophy Class for large characials. Schedules: Mrs. N. Hill Lodge, 195 Ashburton Avenue, Seven Kings, Essex, Essex IG2 9L (phone: 01-992 2279).

22nd September, **LUCAS AQUARIUM & POOL SOCIETY** Open Show, Spring Road, Birmingham. Schedules: Mr. R. Thomas, 11 Alston Road, Nottmill, Works.

8th September, Combined **BRACKNELL AS, DIDCOT AS & READING & DAS** Open Show, White Knights, Bracknell Road, Reading. Details: Mr. John Hower, 4 Rickmans Close, Woodley, Berks. (phone: Reading 666977).

9th September, **HARLOWAS** Open Show, Maer House, Harlow. Schedules: Mr. S. Jordan, 48 Whitewatts, Harlow, Essex.

9th September, **NEWBURY & DAS** Open Show. Details later.

9th September, **NUNEATON AS** Open Show. Details later.

12th-14th September, **BRISTOL AQUARISTS SOCIETY** Open Show. Details: Mr. E. N. Bowden, 12 Stroudleigh Walk, Knowle, Bristol, BS4 1BL.

14th September, **MID-HERTS AS** Open Show. Details later.

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

15th September, **HOUNSLOW & DAS** Open Show, The Youth Centre, Carl Road, Hounslow, Middlesex. Schedules: Mr. H. Pratt, 23 Woodlawn Drive, Feltham, Middlesex (phone: 01-884 9923).

16th September, **KTONE AS** Open Show. Full details later.

16th September, **BUNTON & DAS** Open Show, The Pavilion Gardens, Bunton. Schedules: Mr. A. Holland, 3 Midland Terrace, New Mills, via Stockport, Cheshire.

22nd September, **TORRAY AS** Open Show, Torquay Town Hall. Details to follow.

24th September, **HUCKNALL & BULWELL AS** Open Show, Bulwell Youth Club, Coventry Road, Bulwell, Nottingham. Booking, 12 noon-2.00 p.m. Schedules: Mr. J. Spalding, 273 Widdow Court, Bulford, Nottingham.

24th September, **CHESTERFIELD & DAS** Open Show, Clar Cross Social Centre, Chesterfield Road, Clay Cross, nr. Chesterfield, Derby. Entry 20 off M1, follow signs 4 miles to Show, opposite village on M1. Booking: 12 noon-2.15 p.m. Schedules: Mr. D. Stone, 217 North Wingfield Road, Grassmoor, Chesterfield, Derby, S24 2ER (phone: Staveley 4775).

24th September, **NORTHAMPTON & DAS** Open Show, The Drill Hall, Northampton. Schedules: Mr. G. Allart, 30 Chibson Avenue, Northampton.

4th October, **EAST LONDON A & FA** Open Breeder Show. Schedules: Mr. F. Vicker, 13 Inna Way, Collier Row, Romford, Essex.

7th October, **HENCKLEY & DAS** Open Show, Henthfield High School, Belle Vue Road, East Shilton, Leicestershire. Details: Mr. T. Saunders, 29 Bunting Drive, Laxey.

13th-14th October, **FNAB BRITISH AQUARISTS FESTIVAL** at Belle Vue Gardens, Manchester.

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

2nd-4th November, London's Sixth Annual Exhibition of Fishkeeping: **THE AQUARIUM SHOW '77** at the Royal Horticultural Society's Old Hall, Vincent Square, London SW1. Responses to Show Organiser: P.F.M., 154 Gerrard Lane, London SW17 6NV.

2nd November, **GSGB Quarterly Meeting**, Conway Hall, Red Lion Square, Holborn, London, WC1, 4.30 p.m.

4th November, **MIXENDEN TFS** Open Show. Venue and details later.

17th November, 1977 **HENDON CONGRESS** (provisional date).

17th November, **KINGSTON & DAS SOUTH PARK AQUATIC STUDY SOCIETY** combined Open Show, T.A. Centre, Burlington Road, Kingston, Surrey. Schedules: Mr. D. J. Mackay, 170 St Moore Road, New Malden, Surrey (phone: 01-872 0521; night, 01-942 9933).

1st December, **FRAS Assembly**, Conway Hall, Red Lion Square London WC1, 4.30 p.m.

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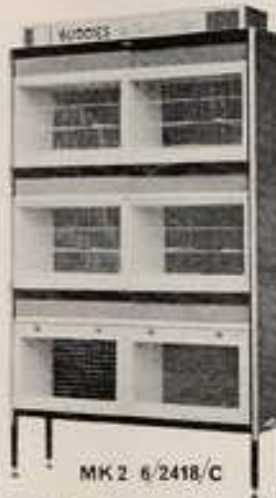
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FBAS Show Fish Guides and Technical Information. Booklets nos. 1, 2 and 3, 24 pages each; 18p each post free. P.F. Publications, 554 Garratt Lane, London SW17 0NY.

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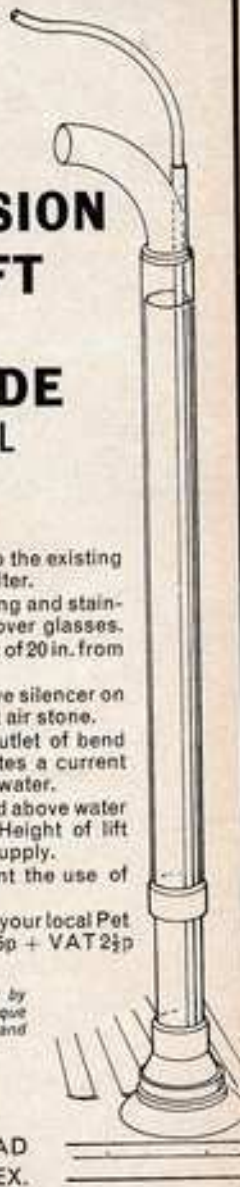
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