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Vol. 5 No. 5

September 1970

Subscription rates: £2 2s for 12 issues; £1 1s for 6 issues (U.S.A. and Canada \$5.50)

Editor: Anthony Evans

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PetFish Publications

Editorial and Advertising Offices

554 Garratt Lane
London, S.W.17
Telephone 01-947 2805

Comments and Quotes

- The Aquarium Show '70
- Goldfish react to pheromones

London Societies— there's a Show on Your Doorstep!

AT the AQUARIUM SHOWS of 1968 and 1969 the Society Tableaux formed the SHOW'S main feature. Tableaux will also be staged at this year's SHOW, open on Thursday 29th October to Sunday 1st November at the Royal Horticultural Society's Old Hall, Vincent Square, London S.W.1. It might have been expected that London Societies would provide most of the Tableaux. Not a bit of it. With a few notable exceptions the London-based participants were rather thin on the floor in 1969. No one seems to know exactly why this is. What are you hiding your efforts for, Londoners? Your Federation wants to see more of you participating in the SHOW. PFM knows full well you're not short of skill and ideas. Why not fly your banner at London's AQUARIUM SHOW this year? A completely new aspect is that Tableaux entrants will be doing their own judging to decide who gets the 1970 prizes. Some details are given on page 215 of this issue. Fuller information is in the schedules available to societies.

In the SHOW'S competitive fish classes, three extra classes have been added. These are for breeders' entries. Show schedules and entry forms are now ready and will be sent on request to the SHOW'S secretary, Mr Gerry Greenhalf, at PFM's address.

Goldfish Alarm State

DID you know that your goldfish has pheromones? You probably did but found the title a bit strange. A pheromone is a substance produced by the skin of a fish and it is thought that the release of one such substance into the water when skin damage occurs is responsible for the 'alarm reaction' then shown by other fish in the vicinity. The alarm reaction in goldfish, for example, is revealed by erratic, agitated and jerky movements of the fish with its fins held fully erect, and it may swim against objects or the sides of a small container when in this state. Biologists have shown that the alarm reaction can be made to take place in quiescent goldfish by adding an extract of goldfish skin to

their aquarium water. After the initial alarm signs the fish stays on the tank bottom, in a cluster with any other goldfish present, without swimming normally again for long periods if the substance is allowed to remain in the tank.

Recent work on the ability of goldfish to learn to avoid a situation which is uncomfortable for them has shown that in the presence of the goldfish pheromone their performance is improved. For example, they learn to swim out of an area in which mild electric shocks are given, just after a light is switched on, more quickly with the skin substance in the water than without it.

The group of workers reporting this from Denison University, Ohio, U.S.A. in NATURE, say that they are unable to explain the effect of the alarm pheromone on the avoidance conditioning in goldfish.



Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London S.W.17

Mr A. G. Jessopp — Tributes

IT is with deep regret that the Federation of British Aquatic Societies has to announce that its chairman, Mr A. G. Jessopp, passed away suddenly on 14th July after a short illness following a heart attack. He became vice-chairman of the Federation in December 1963 and chairman in December 1965 and was a member of the Council of the Federation and Judges and Standards Committee before that.

Ted's service to the Federation has been second to none and he was known throughout the country as a jovial, knowledgeable lecturer and a first-class judge. He officiated at many open shows and represented the Federation as a judge at the B.A.F. at Belle Vue and also at the Furnished Aquaria Competition at Bradford. He also took part in the negotiations that led to the agreement with the Goldfish Society of Great Britain, and was always seeking ways of making a close liaison with the Midland, Northern and Scottish Federations.

Ted Jessopp did a tremendous job for the F.B.A.S. and his high sense of humour often brought a measure of geniality into the most difficult situations. On behalf of all affiliated societies the Federation extends its deep sympathy to Mrs Jessopp and family in their sad loss.

F. C. TOMPKINS
Vice-chairman, F.B.A.S.
E. PYE
Secretary, F.B.A.S.

I FEEL sure that all the members of the F.B.A.S. will join me in sincere condolences to the family of our late chairman and friend Mr Ted Jessopp. He was held in high esteem—both as a man and as a friend by all who were fortunate enough to have known him.

His loss will not only be felt by us as members of the society, but by everybody connected with the world of aquarists.

He was known and respected as a judge, and was unequalled as a lecturer—when on such occasions he shared his vast knowledge with us all, and his passing is a great loss to everybody.
London, W.11

T. W. GLASS

MAY we express the sorrow we feel at the passing of Ted Jessopp. Ted and Betty Jessopp were two of our best friends; we spent our holidays together—one year they would make a tour of the South-West with us, the next we would go South-East with them. How greatly we enjoyed those holidays together. This year his son David is being married on 8th August and they were coming to us on the 10th August. We were looking forward to it.

His knowledge of fishes and of fishkeeping was unequalled. His system of card-indexing of fishes, whereby

he could instantly trace any article written about a fish. His work in the formation of rules for judging a furnished aquarium has been accepted largely. He saw a furnished aquarium as a work of art and proved he knew it to be so by winning the Furnished Aquarium Class as long ago as the late 1950s at the Olympia Exhibition, and followed it by winning a first in many other open shows.

He had a genial personality and humour that made his audience smile and at the same time drove home the point he was making. 'Ted'—the whole aquarist world, the British Federation and all your friends have suffered a loss that cannot be replaced. Goodbye, true friend.

DON AND GRACE CRONIN

Mr D. R. Cronin is the ex-secretary of Erith & D. A.S. and hon. president of Weston A.S.

ALL members of this Society were deeply shocked to hear of the sudden death of Mr A. G. Jessopp. All societies were well acquainted with 'Ted', as he was known to many aquarists, and his activities in the hobby were many.

Besides being chairman of the F.B.A.S., a position which he carried out admirably, his reputation both as a judge and lecturer were well respected, and his life-long experience of fishkeeping was readily available to all who asked.

Throughout a normal year he covered thousands of miles for the furtherance of this hobby and as a Show Secretary I know he was ever ready to help, unless his popularity had already meant the date was booked previously. He has left his mark on the hobby—and he will be sadly missed, but never forgotten, for the work he undertook on behalf of us all.

To his family in this time of sorrow we extend our deepest and sincere sympathies, and feel sure that all societies of the F.B.A.S. throughout the country would wish to join us in this tribute.

W. R. SHERWIN
Show secretary, Hendon & District A.S.

ON behalf of the Fancy Guppy Association may I express our deep regret on hearing of the untimely death of Ted Jessopp, chairman of the F.B.A.S.

Though some of our Sections were affiliated to the F.B.A.S., and knew of Ted's activities through that, many of us knew him from his untiring appearances at shows throughout the country. We would like to express our deepest sympathies to his widow and family.

Manchester

JIM KELLY
Chairman, F.G.A.

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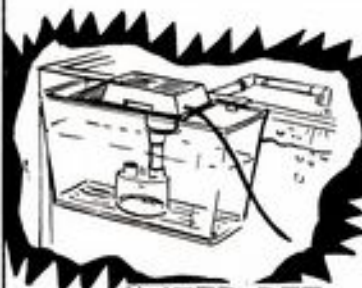
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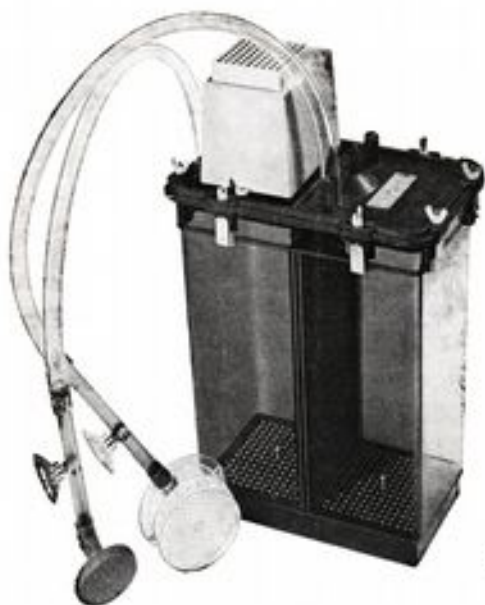


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Transatlantic TOPICS

By JIM KELLY

said about our pussy and his bowl of cream!

* * *

The members of the fair sex are supposed to be afraid of snakes but you would never have guessed it! Every shoe shop, handbag counter and accessory department is full of things made from snakeskin, real or imaginary. Even dresses and wall-paper are included.

This dislike of snakes is also supposed to apply to snakelike fish, but not for Peg Ingram, from the Middle West, whose fire eel (*Mastacembelus erythraeus*) provided herself and her family with lots of fun. True to his kind this eel would spend half its time buried in the gravel, only appearing when the aquarium was darkened. So complete was his withdrawal from the community that at first Peg thought her new purchase had jumped clean out of the tank!

Gradually, the fish became tame and one of his favourite 'party pieces' was to swim up the intake tube of the large external filter, do a couple of laps round the filter box and return to his gravel retreat back down the filter stem.

During one such performance he became carried away by his prowess and finished up on the floor. Lucky for him one of the family was present to rescue him from desiccation. Just to make sure it didn't happen again the pierced filter cap was replaced over the end of the siphon.

Alas! After a cleaning session many months later, the filter cap was accidentally left off and the fire eel perished, stuck up the tube. He had forgotten that he had put on a little weight since he last performed his party piece.

* * *

One of the many things I didn't know about insurance was that you can actually insure your club show for loss of profits due to bad weather! Now, by that I am not inferring that over here we stage our fish exhibitions in the open, but it is a thought, especially after having just endured one indoor event in the atmosphere of a Turkish Bath.

With very little to do and nowhere to go during the judging, the large crowd packed the hall until it resembled a sardine packer's picnic. As the air became more polluted with the exhalations of the human species, and as the temperature rose, so did the blood pressure of those anxiously watching the antics of the chap engaged in sticking the place tags on the various jars and tanks.

LETTERS

continued from page 194

Thank You

COULD I, through the medium of PETFISH MONTHLY, thank you and your team, all affiliated societies of the F.B.A.S., the Goldfish Society of Great Britain, the Fancy Guppy Association and members of S.P.A.(S).S. for their kindness and understanding in the recent death of my husband. There were so many flowers and messages of condolence that it is almost impossible to answer each one individually. I know your magazine reaches far

into the fishkeeping world and if you would publish my sincere thanks to all I would be most grateful.

Erik, Kent

BETTY R. JESSOP

Inflated Claims

IN the past few months, many of the members of the Club have made a comment to me about fish dealers and the way that some advertise their wares. Some advertise that they have hundreds of fish of many varieties always in stock, and hundreds of tanks to put them in. But when you arrive to buy some fish, you find a small room with just two or three tanks and only a few fish for sale. Aquarists would be advised to make enquiries about a dealer before travelling miles to buy fish. This kind of dealer is few, thank goodness.

D. ROGERS

Weymouth & D. A.S.

Keeping the Knife Fish



Xenomystus nigri (Günther)

By J. ELIAS

Photographs by
 RUDOLPH ZUKAL

THIS interesting aquarium fish is a real attraction in the freshwater tank. The shape of its body resembles a knife blade, hence its common name; it is greyish-brown in colour, somewhat lighter round the belly, and covered with tiny scales. Long, dark bands can sometimes be seen along the sides of its body. It has many small teeth and two short barbs on its upper jaw, and structurally it has some interesting features. Its belly is disposed very far forward and is situated just behind the head. The anal opening also lies far forward, under the pectoral fins which are small and hardly movable, and in *X. nigri* the dorsal fin is completely absent. The anal fin, however, which starts just behind the anal opening, runs the whole length of the rest of the fish and incorporates the caudal into one long fringe. The rippling movements of this fin enable the fish to swim both backwards and forwards and it is its sole propelling organ. Little is known about its propagation or differences of sex though it has been reported that, during the spawning process, the fish's grey background colour becomes suffused with red-brown, purple-red colour and that the anal fin becomes olive green.

In its natural waters, from the Nile to Liberia, the fish lives in shoals—only older specimens live a solitary existence and become attackers and unsociable fellows. They can grow up to some 8 in. or so. *X. nigri* lives not only in the rivers themselves but is also found in stagnant tributaries and in areas where river flooding takes place. Such waters are thickly overgrown with vegetation and, in

fact, these are ideal conditions for the fish—still water and innumerable hiding places. In such conditions, of course, the water is usually poor in oxygen and they can in fact take up atmospheric oxygen from the water surface and turn the swim-bladder to account for breathing. They are nocturnal fish, resting quietly during the day with their heads pointing obliquely downwards, swimming out to find their food with the twilight. This would consist, in Nature, of insects, larvae and also the older, larger specimens would eat smaller fishes.

Keeping them in aquaria presents no particular

problems. In our Exhibition at Brno we keep the fish at a temperature of 24-26°C in soft, slightly acid water. Otherwise the quality of the water is not critical in keeping these fish, as we have found from our own experience. They are hardy and, as we have found, not susceptible to any particular disease. They are not choosy over food and will take tubifex and bloodworms as well as other kinds of live food, though it is necessary to give them pretty large helpings. They will also eat dried food. In any event, they are so unique and interesting that they are certainly worthwhile keeping.

When Diseases Strike

DISEASES should be uncommon in established stock if one looks after one's fishes properly, but each aquarist will meet the odd fish disease at some time. There are specific books which deal solely with diseases of aquarium fishes, and common advice is to place in quarantine all newly acquired fish, for a period. Good though this advice is, many aquarists have only one or two tanks, and cannot quarantine their new fish.

Many aquarists, when they find a diseased fish in their tanks, rush off and buy a 'general cure', before they identify the disease. The diseased fish, and often all the fish in the aquarium, are treated with the 'cure'. The result may be that the diseased fish, and possibly some others, die—not from the disease, but from unsuitable treatment. It is necessary to find out what disease the infected fish has before a cure is tried. This information may possibly be obtained from books or from more experienced aquarists who live in the area. If the disease cannot be named, it is often better to leave the infected fish alone, as the fish may recover without any chemical aids. It may be isolated in a large jar, floated in the main aquarium, for observation.

There are now some good stock remedies available from dealers, and a dealer may be able to suggest the disease from which your fish is suffering and the appropriate cure. Unfortunately few fish medicines manufactured commercially show their contents on the package; if a course of treatment with it should fail to cure the fish, one is left wondering if another remedy should be tried, or if it is the same chemicals as were in the first 'cure'. As early treatment is essential for the curing of many fish diseases, any delay at the outset may result in the death of the fish before the 'cure' has time to work. If the first treatment does not cure the fish, and one tried another treatment, the combined effects of both may very well kill the fish. Manufacturers could help by stating what patent medicines contain, as with medicines for human consumption.

Some modern drugs, available only from veterinary surgeons, are effective against a range of fish diseases, and are useful if the disease cannot be specifically named. They are worth a try if the infected fish is a special one. The fish may be treated in a floating jar, but if a number of fish in the aquarium have the disease it may be better to treat the whole aquarium.

By W. ALEXANDER

Among the antibiotics, I have found chloromycetin to be effective against some virus and bacterial infections, and terramycin has cured velvet disease after other so-called 'cures' have failed. For velvet disease, which had infested a number of fish in the same aquarium, I treated the water at the rate of 500 mg. of terramycin per gallon. The antibiotic was in tablet form, and it took seven 500 mg. tablets to treat the 6½ gallons of water in my aquarium. The seven tablets, which I bought from my vet, cost 10s. The price rather shocked me, but the drug certainly 'shocked' the *Oodinium* parasite, which causes velvet disease: the fish were clear of the disease after 6 days in the solution at 80°F (27°C).

The drug was useful in that I was able to treat the whole planted aquarium without isolating the fish. The plants in the aquarium were not affected by the treatment at the time, but later a number of plants such as Amazon swords and giant hygrophylls produced new leaves which were very small and wrinkled, and pale yellowish-green in colour. Later new leaves are growing normally. One interesting side effect was that plants of *Cryptocoryne nevilli*, which kept small and grew very slowly in this tank, suddenly put on a rapid spurt of growth and produced large, healthy leaves.

The tank was lighted and filtered normally, through synthetic wool and with no activated charcoal. The only visible evidence that terramycin was in use was the deep amber colour that the water assumed. After 6 days, when all signs of the disease had gone, the water was replaced with fresh water.

Special compounds, though they are expensive, are well worth trying if specific diseases cannot be recognised and the infected fish are considered to be worth the cost. Your vet may not be an expert in the diseases of fish but he can supply a scheduled compound such as terramycin if you explain to him the purpose for which it is required. Remember that early treatment is essential, in many cases, if diseased fish are to be saved—so don't delay.



GUPPY

World

THE trouble with most fish breeders isn't so much their ignorance as knowing too many things that aren't so! This universal truth is more painfully so when it comes to their obtaining a fish different from the strains they are running.

If the hobbyist finds that the new fish possesses advantages over his existing varieties, he may then be tempted to perpetuate the new at the expense of the old. But what is the best way of setting about such a transformation? Here is usually where those old myths and fallacies lead him astray.

Should the new fish be available in sufficient numbers then it doesn't pose too many difficulties—but what if the new acquisition was just a single specimen? How should the fishkeeper tackle that?

One method I have used with success is to cross the male of the new strain with a female from the old; the hybrid females that result from this mating are then crossed again with the new male. Should the new fish be a female then one chooses a male from the old strain.

If you follow this method vigorously, using the fish from the newly introduced strain it should take but a few generations to complete the change over.

This breeding system is often used by other animal breeders and geneticists and is referred to by them as 'grading up' one's stock. Happy grading! Happy up-grading!



If you, dear reader, are one of the fortunate minority who possess a separate fish room, with storage galore, then read no more, this isn't for you. Rather it is for the majority of us who have to keep our drums of food and equipment in whatever

space the rest of the house allows. If your favourite drum of dried food is sharing a cupboard with household equipment then beware! The food can become polluted and contaminated by those apparently harmless fly sprays and furniture polish aerosols.

One regular reader of 'Guppy World' writes that she lost all her fish after feeding from a tin left next to an uncapped bottle of hair lacquer. One large business concern with an aquarium full of guppies in its reception lounge lost the lot over the week-end. An expert was called in

By PETER UNWIN

and he traced the source of the trouble to contamination by the vapours from a floor-covering detergent used by the office cleaner. Even those nice-smelling, impregnated 'fly papers' hung too near a tank can turn the water milky and poison the occupants.



Breeders of the broadtail guppy varieties are reporting that the dorsal fins on their stock are becoming broader and longer, most noticeable where intensive inbreeding had been carried on.

As most guppies abroad have sported similar fins for some years can we assume that the terrific exchange of stock that took place last year is already having its effect? The close breeding could fix and emphasise this trait and it would require but a few generations to make itself known.

If you are breeding for any variety guppy it doesn't matter, but if your final aim is to win a few pots then you will have to do something about checking this imported feature.

Gentlemen prefer blondes and so, apparently, do guppy breeders because at a recent conference of top experts efforts to oust this colour were defeated. They decided that, in future, the blond and cream colours were to be judged as albino but with a black eye.

The anti-blond brigade claimed that quite a number of poor gold guppies were being passed off as blonds, a subterfuge soon spotted by the judges.

The first gold guppies showed up simultaneously in the tanks of European aquarists in the twenties and spread to the New World, when they were described by Fred Stoye in the April, 1935 issue of *AQUARIUM* magazine. He made a reference to a Czechoslovakian who had produced a lighter version he christened 'blond'. Three years later scientists Haskins and Deuzba carried out intensive studies with these varieties, obtaining their fish from a fancier called Matsumo.

The genes for blond and gold were shown to be independently assorting, non-sex-linked characteristics, both Mendelian recessives on separate autosomes. The latter are the genes in the chromosome other than the pair governing sex.

Crossing gold with blond, they found that the first generation (all heterozygous) were wild grey in colour. When the guppies were crossed brother to sister ('full sibling' in the geneticists' parlance), the experimenters found the expected proportions of nine grey, three gold, three blond and one cream. The numbers of cream were slightly lower than the expected value because, they suggested, of the lethality of the combined genes.

SPEAKER this year at the Hendon Annual Congress organised by Hendon & D. A.S. is E. Roloff of West Germany, distinguished ichthyologist who was author of an article in *FFM* last month. Slides of new fish species and of areas of Sierra Leone visited by Herr Roloff for collection of fishes will be shown by the speaker. Tickets (6s adults, 3s juniors) are available from Mr R. Maynard, 90 Cotswold Gardens, London N.W.2. The Congress is to be held on 14th November at Whitefield Secondary Modern School, Claremont Road, Hendon, London N.W.2.



Before pumping out begins some of the larger fish can be netted and removed to temporary quarters. Others are caught and transferred as the operation proceeds.

THE smaller the garden pool the more often it needs cleaning out. This is a golden rule in pool-keeping and one easy to observe if the garden pool is a puddle. But to clear out and replenish my main pool takes a weekend to do, even though I have help from two of the boys. The job is done once yearly. Whether one cleans out a medium-sized or large pond in spring, as is so often recommended, or in early autumn is a matter of personal choice.

I consider late September to early October as the best time. In the spring months there are tadpoles aplenty and they would have to be rescued. Among the thick stand of oxygenating plants water crowfoot would be about to bloom and it would be a pity to disturb it. On the shelves kingcups would be in full splendour with golden club, bog bean and bog arum in bud. None of these would take kindly to being disturbed. A pool spring clean can also lead to a poor show of water lilies in the summer. What happens is that the moving of the plastic planting baskets causes mud to ooze out of the slatted sides and

The Best Time for Pond Cleaning

Photographs by the author

By BRIAN FURNER

Temporary accommodation for large pond fishes can be provided by lining an old galvanised bath or tank and filling it with clear pond water. Some of the pool plants (not those growing in mud) are also kept in the bath during the clean-out.



fresh soil has to be put in the baskets to replace what is lost. All of this disturbs the plants at a time when new growth is about to start.

Some years ago I had severe pollution in a pool which had been cleaned out in May and not in the autumn. There were no more than seven goldfish in the pool and they did not thin out the fry well. By late summer the pool teemed with small fish. Some were netted but most were left in the pool. In the following March there were ailing small fish on or near the surface and these were netted daily. Several recovered after having been placed in a tank. Many of them must have died in the pool and this caused the pollution which led to the death of two of the large goldfish. The remaining five were netted and housed elsewhere until the pool water was changed in April.

Emptying and Cleaning

I know that many pool owners curse their fish for eating so many eggs and fry but this thinning out is in fact of great help in preventing pool pollution. In a lake, a river or large natural pond fry do not remain where they hatch—as they are forced to do in a garden pool. There are also many predators in the wild to prevent any over-population which may lead to pollution.

My main pool is lined with butyl rubber, so there is no outlet to a sump. The water is therefore pumped out by a submersible Otter pump. Some of the larger fish are netted before pumping starts; others are netted during the operation. To prevent disturbance to the mulm the pump is not placed on the bottom of the pool but in a plastic bowl and the last 6 inches or so of water are not pumped out but are baled out in plastic pails. The pails are emptied into a nylon sieve, which catches any fry we may have missed and also snails and aquatic insects. The larger fish are housed temporarily in a polythene-lined zinc bath and the summer's youngsters placed in large tanks where they will spend the winter. Some of the pool plants are stood in baths of water; others are laid on the ground and covered with wet sacking.

A count is made of everything found. The boys find this exciting. Each has a notebook in which every 'find' is written and all the informa-

tion is copied later into my garden diary. I find washing the mulm through a sieve an unpleasant, smelly business. The boys seem to consider this job a good excuse for getting wet and filthy and shout their heads off when they come across a dragonfly or diving beetle larva.

When the pool is quite empty the liner is washed and scrubbed down. This produces more dirty water, which has to be baled out before refilling starts. In the meantime the irises have been thinned out and all other plants in baskets are checked to see what needs to be done. With spearwort, for example, the plant propagates itself rather like the strawberry and there are always runner plants which need cutting away. These and other surplus plants are shared with pool owners up and down the road. Fresh soil has to be added to most of the planting baskets. This is a time-consuming job. The large stones or shingle which prevent the fish from nosing into the soil have to be removed, the fresh soil added and the stones replaced after they have been washed.

The removal of all dead foliage is an easier, necessary job. I do not suffer much from blanket weed but any adhering to plants and baskets is removed, examined closely to see if any fry or insects lurk in it and then put on the compost heap. About half of the elodea, milfoil, hornwort and water crowfoot is also consigned to the compost heap.

Replanting is carried out during filling and I like to get as many plants in position as soon as I can so that there is less risk of soil disturbance when the baskets are positioned. Were I to wait until the pool were

filled before I planted so many baskets the water would be bound to take on the colour of mud! As soon as the pool is full of water the fish are introduced again and show no ill-effects at finding themselves in fresh mains water.

Feeding ceases around now so there will be no food residues which may lead to possible pollution. Any pieces of waste paper or fallen leaves blown from a nearby copse will be removed as soon as they are noticed in the pool.

Provided that a pool is at least 18 in. deep in the south of Britain and 24 in. deep elsewhere there is little chance of fish being frozen into winter ice. What can lead to the death of fish in winter is a build up of noxious gases beneath the ice. The gases arise from rotting vegetation where the pool is not cleaned out in the autumn. In my butyl rubber, Plastolene and Juralene lined pools there is always at least one-eighth inch of unfrozen water at the sides so that any gases could pass out easily. In a concrete pool a tennis ball is commonly recommended for maintaining a hole in the ice and also for preventing undue stress by freezing, expanding ice which can lead to the cracking of the concrete. I have experimented with tennis balls and I did not find them all that satisfactory with ice more than 1/2 inch thick. The sort of small plastic, inflated ring which children play with in a bath or pool proved better but had to be anchored to a brick at the bottom of the pool to prevent its being blown away by strong winds. The plastic ring was always moving slightly and this prevented ice from forming around it.



Requirements of Water Plants for Aquarium Growth

By Dr JOACHIM SCHULZE

Translation by F. MARSH

THE series of articles in *PETFISH MONTHLY* that have described our expedition in search of water plants through many interesting South American territories should conclude with a short consideration of the conditions required for the cultivation of water plants, particularly *Echinodorus*, in the aquarium. However interesting the ecological and systematic studies in the field may be, we should like hobbyists to profit from these. We go to Nature to learn how to produce the most favourable living conditions in our aquarium as well as to obtain beautiful new species and devise methods for their adaptation to aquarium cultivation. Complete imitation of Nature cannot, of course, be achieved and we can only hope to come somewhere near natural conditions in the plant-culture house. The great difficulty is to compensate for missing or inadequate factors throughout the whole cultivation complex of factors required for growth.

Let us begin with the bottom medium, which has been a problem as long as the hobby has existed. In Nature, most bases contain nutrient-rich clay, loam or earthy humus. The washed, uncompacted coarse-grained gravelly base that many aquarists prefer is almost never found as a water plant substratum under natural conditions. Such a river base would be thrown into such motion by the current that the plant roots would not be able to maintain their hold. It has been demonstrated experimentally that loam or clay in the base soil benefits the plants' growth. However, we need not jump to the conclusion that such a base is essential for good plant growth in the aquarium. If the other conditions are good and the water contains a sufficient amount of nutrient, which it generally does, a pleasing plant growth can be achieved.

Here in Germany there has been available for many years a gardening product consisting of a mixture of peat and clay. The aquarium trade has been accustomed to sieve off the soil content from the peat and mix the clean clay with the gravelly soil in the aquarium, using one part of clay to 10 parts of sand. Clay is here much more valuable than loam, which is not successful as a ballast material for the suggested sand mixture. I have constantly achieved an enormous improvement in growth, particularly with *Echinodorus* and *Cryptocoryne*, with this mixture. The makers of the mixture have now, at the request of aquarists, produced this clay commercially in a cleaner form for use in the aquarium. But there is a disadvantage with this material, as anyone would find who likes to change the plants around in his aquarium. Little particles of clay soon swirl upward to settle on the

leaves of the plants and must be removed as soon as possible.

After some experience with peat, I personally would not recommend its addition. Years of trials have always ended in failure. For a time all goes well, then gases form and putrefaction occurs in the base. If a larger proportion of peat is used in the bottom to counteract the formation of gases and promote ventilation, hardly anything at all was achieved. Many authors are in favour of using peat, for example Professor de Wit in Holland, whose beautiful plants he has cultivated in Wageningen I have been fortunate enough to see for myself. However, his water plants were grown predominantly emersed, or with only a very low water level, both in the greenhouse and in daylight.

On the question of lighting, the answer is very simple though this is in absolute contrast with the frequent and often contradictory pronouncements on it in interested circles. Electric light bulbs are no better than fluorescent tubes, and with the latter the colouring is of no account: plants can assimilate by light of any wavelength. However, the greatest possible amount of light must be provided. Often nowadays in the plant house fluorescent lighting is alternated with daylight and this does substantially improve the growth of plants. The expectations that one had of the Sylvania and Gro-lux fluorescent lighting when this form of lighting first came on to the market have not been fulfilled. They are now used as an extra source of light.

The most difficult factor of all is certainly water. In Nature we find completely soft water in which the variations in hardness mostly fall outside the limits discernible with simple methods of analysis, such as Duronost. In this natural water the total salt content, ascertainable chiefly through conductivity measurements, is also very low. With modern techniques of preparing aquarium water it is not necessary to be content to use the tapwater supplied at one's house. It is possible to condition the water. Unhappily it is still not possible to list any positive results of such endeavours. I have myself started many tests with demineralised water (ion exchange technique) with mainly negative results on the plant growth.

The so-called 'neutral exchange' water softening, by which only the hardness of the water is eliminated, and all the hardness-forming salts are changed into sodium carbonate, is useless or harmful. Reason for the failures probably lies in the impoverishment of the aquarium water's carbonic acid. Carbonic acid is the most important basic nourishment of green plants. Most methods

of replacing the carbonic acid taken from the water are hardly practicable. The simplest procedure is to be satisfied with a partial demineralisation. I have been able to get the best results with the tapwater available to me, which shows approximately 15° DH, with over two-thirds carbonate ('temporary') hardness. Acidification of the water by filtration through peat or the addition of peat extracts for growing plants is senseless and detrimental. We should learn the lesson from the black water biotopics in Nature, with their scanty and rigorously specialised plant growth (see 1974, February, 1970).

Addition of nutriment to the water should be contemplated with great care. Small amounts of fertiliser containing the main nutrient elements, nitrogen, potassium and phosphorus, in concentrations at the highest of 2-3 grams per 100 litres, given possibly only once a month or at each water change, have often proved beneficial. If, however, the tanks are fully stocked with fishes and thereby overloaded with nutriment, any further addition of nutriment or 'manuring' is pointless. On the contrary, frequent changes of water are then helpful.

A very frequent disorder of *Echinodorus* species is the so-called chlorosis. It is produced by acute lack of iron and shows itself by the leaves becoming white and later transparent. Often the new leaves then are smaller and at last the whole plant decays from the heart outwards. Chlorosis also occurred in *Vallisneria*, especially giant

vallis. For a long time one was powerless against it, but an excellent and guaranteed reliable remedy, a preparation which supplies iron to the water in a free form, has been introduced in Germany. The iron in the loams of the base soil or iron introduced by such means as placing a rusty nail in the tank may be sufficient but it is ineffectual because such iron does not go into solution. The preparation is called Fetrilon and was marketed to combat chlorosis in agriculture. A dose of 1.5 grams in 100 litres of water, repeated every 3-4 weeks, is used and works best in conjunction with a water change.

Favourable effects on plant life have recently been observed with the use of strong centrifugal pumps installed in large tanks for better clarification of the water. Perhaps the greater water movement produces a favourable dynamic factor which would have a natural parallel in the strong flow conditions of the natural water.

Our knowledge about the optimum culture conditions for water plants in aquaria has, until now, amounted to no more than a few empirical rules, because a systematic investigation of the large complexes of conditions has not been undertaken, the commercial interest not being great enough; but in future our efforts to keep our beautiful charges will not be doomed to disappointment. The pleasure derived from studying Nature and water plants always richly compensates for the vexations and setbacks.

GOING BRACKISH — 4

Postscript

By ROY PINKS

THREE months after setting up my 'revised' brackish tank I reviewed its performance, with particular emphasis on the way in which its inhabitants had conducted themselves. I had been given rather dismal reports about the brackish species as focal attractions; foremost amongst their alleged shortcomings were quarrelsome temperaments and excessive nervousness.

As regards the equipment I have few complaints, but the emergence of small outcrops of what appears to be rust on the Metaframe tank inclines me to the view that I would have been wiser to have invested in a plastic-coated version from another source. This rusting is especially regrettable when one considers that the salinity is extremely low, and it evokes little confidence in extending the experiment towards full marine concentrations. The Tran Star fluorescent control unit has also proved rather less than satisfactory in that it tends to buzz like an angry bee when first switched on and becomes extremely hot after several hours' use. Frequent attention has to be paid to the top of the aquarium frame and to surrounding fittings to remove encrusted salt deposits. It seems better to attend to this every few days in prefer-

ence to permitting larger build-ups, since the latter seem most difficult to eradicate totally.

In contrast to the foregoing equipment the inmates have been exemplary. There is one large scot and one half its size. They get along very well and I have never seen anything approaching bad temper on the part of either. They both have the habit of retiring behind the coral for much of the day and then assuming head-down positions, the one slightly higher in the water than the other, in a convenient upper corner of the tank just when the feeding session has been completed. The larger sometimes 'sees off' its small companion when it comes to investigating a particularly attractive piece of worm, but this is a habit which can hardly be said to be peculiar to the species. Both fish are in obvious excellent condition but show no significant tendency to put on size. There are no feuds with the other species, either.

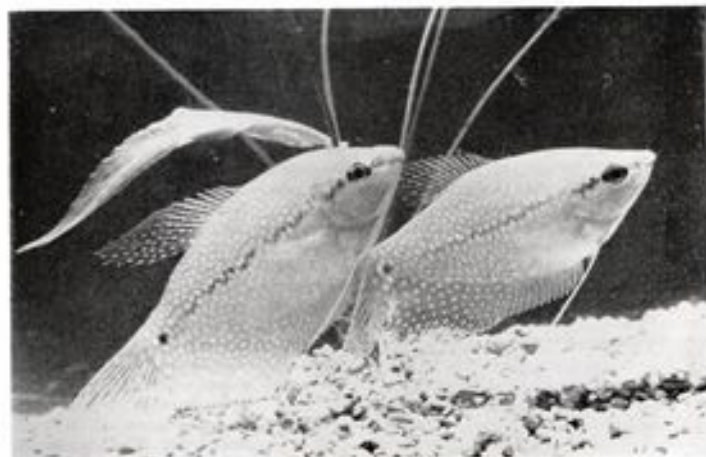
The bumblebees have continued to thrive and to give

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BREEDER'S NOTEBOOK

Care and Breeding of the Leeri Gourami

By J. LEE



Lace, pearl or leeri gourami (male left, female right)

THE pearl gourami (*Trichogaster leeri*), sometimes referred to as the leeri or mosaic gourami, is one of our most popular anabantids, and nearly all breeders seem to be attracted to this beautiful fish and want to try and breed it. It is not a difficult fish to spawn, provided, of course, that you have a definite and well-conditioned pair.

The species grows to about 4 to 5 in. in length and they are very docile and peaceful neighbors for any fish in a tank. Under poor conditions without much cover, they seem to mope away at the back of a tank or behind rocks, looking very shy and timid; but in a thickly planted aquarium, they will swim out into the open and are quite breathtaking in appearance, especially the male. He has a silvery mottled- or mosaic-marked body, a long, sweeping, pointed dorsal fin held erect on his back and a large fan-like anal fin tinted with blues and silver and a touch of violet. From under the mouth, extending right along the stomach, the fish can show a deep blood red. During spawning, the 'feelers' or pectoral appendages of the male become a deep orange-red right down to the tips. The female's body has the silvery tint of the male but not to the same extent. Her dorsal fin is smaller and round and she also has a smaller and rounded anal fin. Near breeding time the belly does show a very slight orange tinge.

My breeders were conditioned over several weeks on red daphnia, ghost larvae, tubifex and a few white worms and chopped earthworms until the female was

swollen with eggs. (Over the years of keeping leeris, I have occasionally used them to clean certain tanks of little crops of hydra brought in with the daphnia. Kept for a couple of days before this without food, leeris will clear a tank of hydra, and three-spot gouramis will perform the same service.) Because my breeding fish were so large, the male being a full 5 in. and the female about 4 to 4½ in., I decided to use a 30 in. by 12 in. by 12 in. angle-iron tank. This was well scrubbed and disinfected with potassium permanganate solution and then placed in a position where the sun's rays could shine into it.

The tank was planted with large *Vallisneria*, thick bunches of *Ludwigia* and *Elodea densa* at the ends, some small plants of four-leaved clover, with eight small Indian ferns and a quantity of *Riccia* (crystalwort) floating on the surface. I used aged tap water, to a depth of 20 in., to which I added three teaspoons of salt. A half-inch layer of deep brick-red sand (well boiled and washed) was used as compost. The last touch was a topping up, to the depth of another inch, with fresh tap water. The pH test showed round about neutral and the temperature was about 78°F.

The breeding pair were introduced to the spawning tank late at night and allowed to settle, and it took them a full week to do this. For a day or two they were very timid, hiding behind the flower pots in which I had placed the *Vallisneria*, but as they inspected their quarters over and over again they must finally have decided that everything looked all right. One nice sunny morning,

at about 9 o'clock, the male donned his dazzling breeding colours. You really have to see this to believe it. Underneath, from his mouth to his caudal, he was scarlet red and his appendages were deep orange-red right down to the tips. The mosaic pattern on his body seemed to stand right out as if it was printed on the sides. For a fairly large fish, this was one of the most beautiful sights I had ever seen in the aquarium.

He was now flashing around the female, displaying all his finnage and colour to her. Her attitude seemed to be a 'couldn't-care-less' one and her appearance was quite dull in comparison with his. After this had continued for a while, the male started to build a bubble nest amongst the Indian ferns and *Riccia* near the back of the tank, close to a flower pot. After a lot more chasing and showing off in front of the female, he gradually coaxed her under the nest where he wrapped himself right round her body in the embrace. With some trembling as the pair were side by side, she was induced to release a number of eggs. These were caught and blown into the bubble nest at the surface. Time and time again these actions were repeated until the female was spent.

As this species is peaceful, the female was left in the tank, and on no occasion was the male ever seen to bully his companion, only showing a slight aggression if she ventured too close, as all the time he was busy beneath the bubble nest. The temperature varied slightly from

78° to 80° F and the eggs hatched in 48 hours. From this spawning 800 fish were reared. I would estimate that there were about 1000 fry, but of course the weaklings were dying off. The female was removed 3 days after and the male one week after the spawning took place. He had proved a very good father.

Of course, as with all labyrinths, a glass cover should be placed tightly over the tank as cold air on the surface can cause a lot of losses in the developing young. This is because a special breathing organ (the labyrinth) is used by these fish to take atmospheric air at the water surface.

As with dwarf gouramis, three-spots and opaline gouramis, a good area of water surface is needed in raising tanks or large losses result because of overcrowding. The first food for baby pearls is green water containing a rich supply of small infusorians. The yolk of a hard-boiled egg sieved through cheese muslin is also suitable and on this diet they soon make progress until they are able to take brine shrimps and micro worms. Soon they take shape and begin to look like replicas of their parents.

A few hundred 1-in. fry in a large tank make a sparkling sight. In just over 18 months of breeding leeries with the magnificent pair I had then, I totalled about 5000 fish reared with success. Much of the success was due to the breeding stock but plenty of room and a large surface area is, in my opinion, the key to success in rearing the fry.

Postscript

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rather less trouble in so doing than almost any other fish I know. Their utter hardness, their attractive and unusual colouring, and their readiness to feed on any live food you care to toss in make them perfect for these brackish surroundings. Their diminutive quaintness and a lack of concern for what is going on around them give them a personal appeal which I find irresistible. So much so that I am now on the hunt for a few rhino-horn gobies to give further variation, but so far they have eluded me. The gobies are less kind to one another than perhaps we would have them, but I have observed many of the fights which go on and I have come to the conclusion that there's an awful lot of show in them and not too much malice. At any rate there never seem to be any torn fins or other bodily damage, so perhaps they have made war into a fine art and kept it that way.

I ended up with four monos, in descending order of size from about 3 inches. Having witnessed some of the bullying that goes on in unfurnished and quarantine tanks I was not too happy that Junior would ever quite hold his own against the biggest of the quartet. During the first few weeks a certain amount of chasing took place amongst the others, but the little fellow was virtually unmolested and it was either the second or third in size which finished as a trembling black phantom behind the rearmost coral hideout. More recently they have taken to schooling, and what a splendid sight this is. This is not

a continuous process, as they more often go their own ways, but quarrels seem very infrequent and only once does there seem to have been an attack on the tail end of one of them. There has been some growth but not much, and perhaps a combination of good feeding and salubrious conditions will enable me to achieve their 'dwarfing', which was my original aim, without any detriment to their health.

The fishes have thus behaved much more peacefully than I expected they would, and possibly a contributory factor has been the heavy concentration of coral which I introduced into the tank. I reasoned that fishes with reputations for moodiness like these would need lots of hiding places, such as are offered by the more open forms of coral, and in this respect the arrangement has passed its early tests. The bleaching of the corals has posed no particular problems. On the basis of my experience so far it would be a pity to let them go much beyond this because scruffy coral is about as attractive as dirty finger nails but much simpler to prevent.

I have been impressed by the cleanliness of the tank. It has no filter of any sort and muck has not so far gathered in sufficient quantity to necessitate its artificial removal. I have never fed with anything but live food and herring roe, none of which has much of a chance of going unnoticed with such excellent scavengers always ready to pounce on anything edible.

This is easily the most attractive and trouble-free tank I have experienced, alarming though the initial experiment turned out to be. It is interesting that I now have little desire to add fresh inmates—apart from those gobies—but simply to admire those which are there, and to watch them develop into first-class specimens. After years of fishkeeping I know that this can't be the end of the story, but it makes a very good beginning.



Personal COMMENT

by
ARPEE

I WAS busily peering into a tank in the local shop the other day when I heard a worried beginner unloading some of his worries on to one of the ever-helpful assistants. It so happened that the problem had electrical ramifications and as she is literally terrified even of torch batteries she nudged me into the conversation in the hope that I might offer some suggestions. It appeared that here was a beginner with a 2-day-old tank equipped with an outside thermostat, which never seemed to work when the overhead lights were on, and which seemed to have one layer of water at 85°F and another lower down at 60°F. What had he done wrong?

The answer, of course, was that he had done nothing wrong at all but deserved a bonus mark or two for being so observant and for bringing his problem back to the dealer. I advised him to get his pump going at the earliest opportunity, which would cause the warm water to mix with the cold, and to report back if the overall temperature failed to hold at about 75°F after a day or so of this treatment. If he had had no pump the introduction of a few vigorous fish would have brought about much the same state of affairs (and any uncharitable readers would add a touch of white spot for good measure!). But how important, really, is this question of temperature?

Certainly, the maintenance of temperatures between 70°F and 80°F is important for the well-being of most of the species we regard as being in the tropical class, but it is questionable whether the pegging of temperature at a single, spot-on point, such as 75°F is in any way meritorious. To me it simply means that you have an efficient thermostat and nothing more. There are scores of aquarists who will testify that rapid temperature changes do not cause white spot or anything else, and there are many others who will lay claim to topping up their tanks with cold water straight from the tap without any resultant ill-effects.

If you veer away for a moment from the artificial conditions in an aquarium and compare them with what happens in Nature you will find that very similar circumstances exist there, since warm water always lies above cold water, irrespective of the source of heat. You could conclude from this that, since Nature is selective and not benign, this stratification of water is one of the ways in which it sorts out the weak from the strong; the weaker fish would succumb to whatever perils derive from their being subjected to exposure to cold water. But is this really true? Because we have very many fish being so inspired by an inrush of cooler water that they straightaway enter into spawning preliminaries, sometimes after periods of long abstinence. Clearly, in such instances even considerable temperature changes



give rise to no sort of concern whatever. It will be no surprise therefore if the aquarist is simply advised to exercise moderation over the matter of temperature variations.

Whatever may be said to the contrary I very much doubt whether 5°F either way will make much difference to an average healthy fish, any more than the passage of *Homo sapiens* from a centrally heated room to the embrace of a freezing winter's day outside will cause him any harm. It makes a lot of difference if the fish has just suffered a two thousand mile trip in a joggling plastic bag, alongside several hundred others of its kind, some in advanced states of disease, or if the *Homo sapiens* is ancient and chronically unwell. In both cases every additional unit of shock does something to the system which further weakens it and subjects it to the microbial onslaught from without.

If you are moving your fish around from tank to tank in your own environment (disease-free, of course!), you can be fairly certain that differences of a few degrees will make little difference to healthy and established fish. The importation of fish from any other source should be regarded with the utmost suspicion, however, for the sake of being safe. You must then assume the worst: that they are all sickening for spot and goodness knows what else, and this means a 14 days quarantine and the equalisation of temperatures between the travelling container and the water into which they are to spend the next phase of their existence.

Whilst temperature variations don't actually scare me I tend to take few liberties when topping up my tanks. I borrow my wife's preserving pan and fill it from the rainwater tank, and then raise the temperature to a little short of that in the aquarium (about 2°F to 5°F) before transferring it in a glass jug. I let it roll in fairly swiftly, and if there is free swimming algae and daphnia present the fish have three treats in one. I am a 'moderate' therefore in this practice, but I have a feeling that if the most convincing case were assembled to demonstrate that you could add ice-cold water with complete impunity, we should still follow our traditional topping-up techniques. I would back this all the way, since when one is treating with natural things instinct is often more reliable than rationale.



It is often said that the cobbler's son is the poorest shod, and so it may well be with the ichthyologist. A visitor was recently trying to engage my five year old son in conversation and found it difficult going. Thinking that the fish were a safe bet to break the ice, he pointed to the biggest of our male angels and asked Michael what it was called. The answer 'Fred' was factually correct, but reflected an ignorance of scientific nomenclature which we can only hope will be remedied with the passage of time.

Readers' Queries Answered



Sensitive Orfe

I have just lost four large golden orfe in my pond. One of these was bought in 1967 and the remaining three in 1968. They grew large and ate well and got through the hot 1969 summer well although the pool has no waterfall or fountain. The pool was last emptied in the spring of last year and it is now overgrown with oxygenating plants of all kinds. Last week all four were found dead—the mouth of one was open. At first I suspected pollution but I would have thought that small 2-year-old goldfish would have suffered first. What would you suggest is the cause of these deaths?

Golden orfe are much more sensitive to changes in temperature and oxygen content of the water than are goldfish and carp. From the details supplied, it would seem that these sudden deaths, all at once, are only accountable for by some acute change of this sort. Poisoning or pollution seems to be out of the question as undoubtedly this would affect the goldfish, although given a mild pollution plus a sudden rise in water temperature the combined effects on fish such as orfe are always so much more disastrous. Respiratory difficulty is likely to have been the cause in view of the hot thunderly weather lately experienced in your part of the country.

Cuban Livebearer

Can you please tell me something about Girardinus metallicus? I have seen this in my local shop recently. Is it a new livebearer?

This fish is a very old-established species to the home aquarium, but it is not of great popularity these days as there are so very many more colourful livebearers to choose from. It originates in Cuba; males reach up to 2 in. in length and females 3 in. It is a peaceful and hardy fish and derives its name from the

metallic glint it throws off in reflected light, from the silvery bars that cross its body which are interspersed with darker markings. Small shining green dots are sprinkled round the eyes and on the gill covers. The dorsal fin of both male and female carries a black mark. The male's gonopodium is very long and ends in two points, the lower and longer one of which is slightly hooked.

The fish eat anything, though mosquito larvae are particularly acceptable. They prefer slightly hard water and breed regularly, though not in very great numbers. Some do have a tendency to eat the fry but if the parents are well fed and there are plenty of floating plants this problem should not arise.

Cloudy Pond

I built my fish pond in the garden a year ago. I lined the bottom with loam and on top of that used inverted turves in which I wedged the various plants. I gradually filled the pool over the next 2 weeks and after a further 3-4 weeks stocked it with goldfish, shubunkins, comets and golden orfe. After the fish had been in the pool for about 2 weeks the water became very cloudy where the fish had evidently stirred up the mud from the bottom. I was hoping this would clear but it did not. The plants are again showing but the water is still very cloudy. I am now wondering whether I should drain it off and lay about 3 in. sand over it all?

Our advice would be to postpone any decision to empty it. It would not necessarily remedy the cloudiness at once and if, as you say, the plants are now growing well and the fishes appear to be thriving, we think it very likely that your pond will clear, probably quite suddenly, of its own accord. A gentle flush through with a slowly running hose, so that there is no disturbance to the pond's bottom, could be beneficial

about this time. If you wish to hasten the natural process there is a very useful small pond filter now on the market.

Fouling the Breeding Trap

I find that the food I give to the occupants of my breeding trap collects on the bottom of it and I feel that this unclean food may be harmful to any fry that are born. I would like to remove the adult fish and occasionally clean the trap, but I believe netting these fish can cause premature births. Perhaps you can advise me how to clean the trap, if this is necessary.

Prevention rather than cure is the solution with breeding traps, and enormous care must be exercised when feeding their inmates. If dried food is used the merest sprinkling should be given and if this is eaten at once more added practically flake by flake or by the half-dozen grains. Better still, give only live *Daphnia* (and then only in quantities the fish are likely to consume). If the breeding trap is already fouled up, we would recommend placing an opened polythene bag in the water, with its opening beneath the water surface, gently tipping the breeding trap so that the occupants can only swim into the bag opening, and then quickly cleaning out the trap, while the fish are held safely in the bag. In this way the net need not be used at all.

THE BRITISH KOI KEEPERS' SOCIETY is now in the process of formation and Mr Ken Fawcett of Fantasy Pet Products Ltd outlines the proposals in the *Koi Newsletter* for July. All decisions, finance, policy etc. are to be handed over to an independent committee within one year of the Society's formation. Members will be able to exchange views through the issue of a regular Newsletter and initially, until such time as the organisation is handed over to the elected committee, one year's subscription (July 1970-June 30th 1971) will cost 5s. Mr Colin Roe and Mr Anthony Evans, co-authors of the book *KOI—FANCY CARE OF JAPAN*, have agreed to be honorary vice-presidents of the Society. Anyone interested in joining should write for information to: K. Fawcett, Fantasy Pet Products Ltd., 13 Natley Lane, Reigate, Surrey (phone Reigate 47305).

Breeding the Festive Cichlid



Left: male; right: female

Cichlasoma festivum (Heckel)

By RUDOLPH ZUKAL

Photographs by the author

Translated by F. MARGH

MANY aquarists frown at the mention of 'cichlids'. With festive cichlids, however, there is no need at all for such a reaction for here we are dealing with the exception to all we know of cichlids as gravel movers and attackers. It is true that this fish reaches a size of about 6 in., but it remains peace-loving and resembles the angel fish in character and requirements. It is in fact found in the same habitat as the angel, in the calm waters of the Amazon basin.

This beautiful cichlid was imported into Europe in 1908 under the name *Mesonauta insignis* Günther. I won't describe the fish in words because the photographs can do it much better. Sex differences are not difficult to recognise, not so much in the young adult fish, but more so with fish in their second year of life. The male is the more powerful fish, and his dorsal and anal fins are drawn out to points.

The festive cichlid has, up till now, been counted amongst the fish that are difficult to breed. I don't entirely accept this assessment of the species though I would not say that they were easy to breed. One thing is indisputable—as with all fish that one wishes to propagate, they must be studied and provided with the conditions that they require.

Festive cichlids should be kept in a largish tank (20-60 gallons) at a temperature of 72-76°F (22-24°C). There need be no hesitation about keeping them with other fish; as I have said, they are peace-loving and even somewhat nervous. Best of all, keep them with angels. For breeding purposes, the temperature should be raised to 79-82°F (26-28°C) and the parents should be at least 1 year old. Eggs are laid on stones that have been cleaned previously, or on firm surfaces such as plant leaves, just as we are familiar with from other cichlids (*Aequidens* and *Cichlasoma* species). A fairly large number of eggs is laid and 500 is not unusual. The brood hatches after about 48 hours. Both parents will usually tend the eggs and the fry are free-swimming on the sixth day.

It does often happen, however, that the parents eat the eggs or do not look after them. It is for



The female decides on a suitable spawning place—here a large flat stone. A plant leaf is in the way of preparatory operations and, watched by the male, the female tugs at the plant until it is broken.

this reason that festive cichlids are said to be difficult to breed. This is usually caused by one of two things: either the pair are not suited to each other, the male probably being of poor stock, or the fish have been disturbed and seize the eggs out of sheer nervousness. If the eggs are not carefully separated from one another by the parents' fin-movements they are affected by lack of oxygen in the water, dirt settles and fungus grows on them. This is what happened in the spawning photographed; it can often be prevented by removing

the stone or leaf on which the eggs have been laid to another tank (a small one is quite suitable) and putting an air stone in so that the fine air bubbles serve the same purpose as the fanning movements of the parents' fins. The fry grow quite quickly and will soon be feeding on fairly large live foods.

If you find that the eggs develop fungus, don't give up hope. Feed the fish well and repeat the breeding procedure after 4 weeks—and go on trying until the spawning does succeed. This is what makes our hobby such a fine one.



The selected spawning stone is thoroughly cleaned by the female, watched by the male who appears to get impatient and prods his partner from time to time. Exceptionally the male takes a turn at cleaning.

Eggs of the first spawning failed to develop and became white with fungus. Here the female is seen over the dead eggs on the stone



Guppy Types No. 3: The Robson

THE Robson male and female guppies, the only varieties ever to be named after their breeder, are somewhat of an enigma in the hobby for today the Robsons are as rare as the passenger pigeon.

This strain, built around the female, was produced by Mr R. Robson, from Highgate, London, in 1937. The female sported blue/black fins on a standard female roundtail outline. The male, having the same caudal as the roundtail, differed in that it sported a long, pointed dorsal. They were listed as a standard in 1938 with the recommendation that 'Robby' (as he was known to all), worked on them and lengthened the top fin.

With the outbreak of World War II, his fishkeeping came to a halt when he joined the Medical Corps, but immediately on his demob he started again and was rewarded in November, 1947, with the first Fellowship ever granted by the G.B.S. A fitting reward for his hard work and determination.

Though much inbreeding had gone into these fish, the female proved to be much larger than her sister standard. The jet black of the

fins was relieved by splotches of yellow in the caudal peduncle area; her body, basic grey in colour, was spotted with delicate shades of blue and green.

In the male Robson, the tail was coloured yellow, edged all round with a black line. The dorsal or top fin was white, a thin, dark line running along its length. It lacked any of the body spots observed on almost all other males at that time.



ROBSON

At first, everyone thought Mr Robson produced his fish by crossing the guppy with the black mollie, but this he denied. Many tried to find from the breeder how it was done but Robby's lips remained firmly shut. Whilst working as a decorator in May, 1948, Mr Robson fell to his death from some high scaffolding and the secret of the Robson guppies died with him.

Though many species of Robson guppies were about at the time of this

fatal accident, their owners failed to produce fry from them equal to the original parents and the type soon died out. The specialist hobby did all it could to encourage breeders to try for the Robson and for many years still included classes for these fish in their show schedules, but even their enthusiasm waned when no entries resulted.

I think that one of the contributing factors to the failure of breeders to find out why was the establishing of both a male and a female standard for Robsons. This encouraged newcomers to breed these two fish together and I am positive that was not how Mr Robson bred his unusual and magnificent guppies.

Even as late as the early fifties the cry that someone had bred them sent specialists scuttling all over Britain, but most of the claims were by well-meaning, if not well-informed, aquarists who had only a vague idea of what these guppies looked like.

Modern-day Standards lack these fish but we still live in the hopes that someone, someday, will once again confound the experts.

J.K.



THE THREE COUNTIES annual open show was staged on Sunday, 5th July and a total of 384 entries were benched. The Bracknell Cup for the highest number of points awarded to a society was won by the host club, High Wycombe, and the Turner trophy for the High Wycombe member receiving the greatest number of points was awarded to Mr R. G. Cox. Mr Cox was very successful also in winning both the Three Counties and the High Wycombe trophies for breeders livebearers and the Rundle Rose Bowl for the best livebearer. The best fish in the show was a *B. platunus* entered by Mr S. Cowell and with this fish he won the High Wycombe trophy for the best fish in the show and the Speedy Edmonds/Bill Lock Bowers trophy for the best barb. The Three Counties shield and the High Wycombe Committee trophy for best tropical breeders (egglayers) were awarded to Mr Charmouth St John, and the Three Counties trophy for the best breeding achievement went to Mr M. Strange for *P. schomburgki*. The Bovingdon trophy for coldwater breeders was won by Mr S. Tibble for twintails. Other trophy awards were: Basingstoke Cup for best characin, Mr T. Summers; Rundle Cup for the best anabantid, Mr R. Hicks; the Dicedot shield for the best cichlid, Mr B. Sargent; the Oxford Cup (independent tropical furnished aquarium), Mr D. Schramm; the Ann Seed Rosebowl for best goldfish, Mrs Ann Seed.

Detailed results were:

Barbs: 1, Mr S. Cowell (*B. platunus*, 81); 2 and 3, Mr C. Pike (blackie, 82, 81); **Characins:** 1, Mr T. Summers (*Mifoxius*, 79); 2, Mr J. Davidson (*Mifoxius*, 78); *Hemigrammus*, *Hemigrammus* and *Chorodius*: 1, Mr M. Strange (*H. pulcher*, 80); 2, Mr S. Cowell (*sepius*, 77); 3, Mrs O. Leslie (blackline tetra, 78); **Cichlids:** 1 and 2, Mr B. Sargent (*heteran*, 84; *ocor*, 81); 3, Mrs M. Nathwell (*Tilapia* spp., 83); **Labyrinth:** 1, Mr R. Hicks (blacklip, 81); 2, Mr F. Nordick (cumbal, 82); 3, Mr S. Cowell (*C. longipet*, 81); **A.A.S. tropical cutfish:** 1 and 2, Mr T. Summers (*Nyssa*, *gastosteanus*, 79); 3, *scholostem*, 77); 4, Mr D. Walls (*P. gracilis*); **Corydoras and Brokers:** 1, Mr J. Stamp (79); 2, Mr D. Armes (78); 3, Mr H. Thompson (*C. amez*, 78); **Rasbora:** 1, Mrs G. Carter (faint rasbora, 80); 2, Mr R. Hicks (*B. anabantus*, 78); 3, Mrs N. Jordan (*B. maculata*, 77); **Danio and minnow:** 1, Mr B. Dibbey (giant danio, 79); 2, Mr D. Patt (pearl danio, 78); 3, Mr M. Carter (*B. modesta*, 79); 4, Mr M. Carter (*B. makinoi*, 78); 5, Mr T. Butler (koi)

loach, 77); **A.A.S. tropical egglayers:** 1 and 2, Mr M. Strange (*P. schomburgki*, 82; ruddin shark, 79); 3, Mr P. Arnold (flying fox, 79); **Pair of fish:** 1, Mrs J. Garrod (Dumbo gourami, 80); 2, Mrs E. Rutland (*C. nigropinnis*, 79); 3, Mr C. Pike (checker barbs, 78); **Swordtails:** 1, 2 and 3, Mr B. G. Cox (green, albino, green, 79, 78, 77); **Platy:** 1, Mr B. Cook (topper, 80); 2, Mr D. Schramm (red wag, 79); 3, Mr C. Pike (yellow wag, 76); **A.A.S. livebearers:** 1, Mr M. Carter (trouty widows, 80); 2, Mr T. Butler (trouty widows, 79); 3, Mr and Mrs Abbot (speckled snail, 77); **Breeders egg-layers:** 1, Mr Charmouth St John (*C. anabantus*, 78); 2, Mr M. Strange (*P. schomburgki*, 79); 3, Mr L. Jordan (blue scara, 77); **Breeders livebearers:** 1, 2 and 3, Mr R. G. Cox (71, 68, 67);

A.A.S. coldwaters: 1 and 2, Mr D. Patt (cuttlebacks, 72, 68); 3, Mr D. Arkell (cutfish, 70); **Common goldfish, London shubunkins, comets:** 1, Mr L. Waller (78); 2, Mrs A. Seed (77); 3, Mr C. Burns (76); **Scaldfish:** 1, 2 and 3, Mrs A. Seed (78, 78, 74); **Twintails:** 1, Mr A. Smith (73); 2, Mr H. Jago (74); 3, Mr S. Tibble (72); **Globe-eyes etc.:** 1, Mrs A. Seed (Globehead, 67); **Breeders coldwater:** 1, Mr S. Tibble (troutish, 72); 2, Mr H. Jago (fantail, 72); 3, Mrs A. Seed (fantail, 71); **Fantail, moor, orandas:** 1, Mr S. Tibble (broadtail moor, 72); 2, Mrs A. Seed (fantail, 71); 3, Mr F. Radford (fantail, 70);

Club furnished, tropical High Wycombe, independent furnished, tropical: 1 and 2, Mr D. Schramm; **Club furnished, coldwater:** 1, Bracknell; 2, High Wycombe.

MID-SUSSEX A.S. warmly welcomed Mr F. C. Katritzky to their July meeting where he gave a most enlightening talk and slide show on tropical plants for the aquarium. This is one of the last lectures before retiring that Mr Katritzky, now 84, will be giving. In his retirement he hopes to visit as many Botanical Gardens throughout this country and overseas as possible to further his already extensive knowledge. In his talk Mr Katritzky suggested that all aquarium plants should be planted in shallow trays or half-pots filled with suitable potting material. This allows the plants to grow well without causing damage to the roots, which normally occurs when plants are moved about the aquarium. Mr Katritzky explained that hard water can be softened by leaving a quantity of *Eloides* in it. The 'hardness' can be then seen in the form of a deposit on the plant leaves.

Results of the table show were: **Show tanks:** 1, Mr C. P. Corbin; 2 and 3, Mr D. Soper. **Show jars:** 1, Mr R. Smith; 2, Mr D. Soper; 3, Mr N. Short. For any further information please contact secretary Mr J. Reeve, 36 Rumbolds Lane, Haywards Heath 3702 (evenings only).

AREBOROUGH & D.A.S. are in the pleasant position of having had new members join the Society at every meeting so far this year; total membership now stands at 88. At this year's 'Members Show', 77 entries were benched. The Congo tetra owned by Mr Roy Taylor was judged by Mr A. M. Deakin of

Workshop to be the best exhibit in the show. Class winners were:

Guppies, Mr H. Gardner, Barbs, Mr R. Taylor, Cichlids, Mr M. Dwyer, A.O.V. anabantid, Mr A. Cox, Catfish and loach, Mr and Mrs J. A. Whitley, A.O.V. livebearer, Mr B. Megson, Characins, Mr R. Taylor, Siamese fighters, Mr R. Taylor, Flying foxes and sharks, Mr G. Monk, A.O.V. Mr R. Taylor, Coldwater fish, Mr B. Megson, Novos a.v.: Master R. Johnson, Junior a.v.: Master P. Dwyer. Breeders livebearers, Mr H. Gardner. Breeders egglayers, J. and A. Stretton, A.S. pairs, Mr B. Megson. Furnished mini-jars, Mr B. Megson.

The Society is now busy preparing their stand for this year's B.A.F. and arranging an inter-society table show and social evening and a fashion show for members, wives and friends. Arrangements for this year's annual open show are also well in hand and schedules will be available from the secretary from September onwards. Interested aquarists who wish to become members will, upon request, receive from the secretary duplicated information about the Society's activities. Alternatively they will be welcome at any of the meetings, which are held on the first Thursday of each month at 8.0 p.m. in the Co-op. Hall, Guseley, nr Leeds. Secretary is Mr C. E. Walker, 28 West End Terrace, Guseley, nr Leeds, LS20 8LN.

A BLUE scara entered by Mr P. Payer received the best fish in the show award at the **CARDIFF A.S.** open show. Mr G. Gorwill achieved most points and Master Martin Wilkie received the James Callaghan Cup for the highest pointed fish entered by a Cardiff A.S. member. Details of the results are:

Guppies, male: 1, Mr C. Ham; 2, Mr J. Edwards; 3, Mr A. Ward. **Guppy, female:** 1 and 2, Mrs Pacey; 3, Mr and Mrs Baydon. **Mollies:** 1, Mr and Mrs Williams; 2, Mr E. Brooks; 3, Mr C. Barr. **Siamese:** 1, Mr B. Small; 2, Mr C. Pacey; 3, Mr D. Noble. **A.O.V. livebearers:** 1, Mr R. Hoare; 2, Mr B. Small; 3, Mr J. Powell. **Fighters:** 1, Mr S. Scudamore; 2, Mr and Mrs Baydon; 3, Mr and Mrs Harding. **Labyrinth:** 1, Mr B. Gorwill; 2, Mr E. Harding; 3, Mr D. Warramant. **Barbs under 2.5in.:** 1, Mr G. Churchill; 2 and 3, Mr D. Warramant. **A.O.V. barbs:** 1, Mr B. Gorwill; 2, Mr D. Warramant; 3, Mr B. Harding. **J. and H. characins:** 1, Mr H. Jones; 2, Mr and Mrs Harding; 3, Mr R. Wilson. **A.O.V. characins:** 1, Mr J. Turner; 2, Mr E. Brooks; 3, Mr R. Hoare. **Cichlids:** 1, Mr P. Payer; 2, Mr J. Turner; 3, Mr B. Gorwill. **Dwarf cichlids:** 1, Mr T. Haron; 2, Mr Brown; 3, Mr W. J. Allen. **Angels:** 1, Mr H. Humphreys; 2, Mr P. Sargent.

THE FIRST open show to be held by **BISHOPS CLEEVE A.S.** attracted 272 entries and the best fish in the show award was made to a *Corydoras* entered by Mr Williams

of Rubery, which achieved 86 points. Below are the details of the results:

Guppies, male: 1, Mr J. Wheeler (Trowbridge, 74); 2, Mrs I. Whitfield (Rubery, 71); 3, Atwood and Williams (Rubery, 66).
Guppies, female: 1, 2 and 3, Mr J. Wheeler (Trowbridge, 71); 76, 66; **Mollies:** 1, Mr M. H. Carter (Bodsworth, 73); 2, Mr C. Ham (Rhondda, 73); 3, Mr Williams (Rhondda, 74). **Swordtails:** 1, Mr R. F. Stevens (74); 2 and 3, Mr B. Stoll (Yate, 74); 74; **Fish:** 1, Mr J. Parker (Uxbridge, 71); 2, Mr G. R. Farber (Bristol, 71); 3, Mr F. Scriven (B. Cleve, 70).
Barbs: 1, Mr D. A. Warrmann (Cardiff, 81); 2 and 3, Mr F. J. Beard (Leamington, 81); 81; **Danios, minnows, rudds:** 1, Mr N. Furness (Rubery, 74); 2, Mr M. Samuels (Trowbridge, 72); 3, Mr R. A. Bennett (Yate, 73). **Betta, loaches, sharks, fish:** 2, Mr G. R. Farber (Bristol, 76); 3, Mr F. Beard (75); 3, Mr Williams (Rubery, 71). **H. H. and Cleve:** 1, Mr J. Wheeler (Trowbridge, 70); 2, Mr F. Pulman (Stockton, 78); 3, Mr M. Butcher (Trowbridge, 72). **A.O.V. characin:** 1, Atwood and Williams (Rubery, 82); 2, Mr R. Shakespear (Bodsworth, 82); 3, Mr Williams (Rubery, 79). **Dwarf cichlids, Apistogramma, Neoglyphis:** 1, Mr M. Butcher (Trowbridge, 70); 2, Mr F. Brain (76); 3, Mr P. Jenkins (Rhondda, 74). **Large cichlids, angels, Cichlasoma:** 1, Mr N. Doolley (B. Cleve, 71); 2, Mr M. Samuels (Trowbridge, 73); 3, Mr G. Mapled (Trowbridge, 74). **Siamese fighters:** 1, Mr B. F. Hirst (Covestry). **A.O.V. anabantids:** 1, Mr R. Shakespear (74); 2, Mr G. R. Farber (Bristol, 70); 3, Mr C. F. Pary (Rhondda, 72).
Corydoras catfish: 1 and 2, Mr Williams (Rubery, 86, 84); 3, Mr J. Wheeler (Trowbridge, 84). **A.O.V. catfish:** 1, Whitfield and Macey (Rubery, 86); 2, Mr F. Brown (81); 3, Mr F. Pulman (Stockton, 82). **A.O.V. tropical:** 1, Mr R. Shakespear (84); 2, Mr T. Davies (Rhondda, 78); 3, Mr L. Smith (Yate, 74).
Pairs: 1, Mr R. Shakespear (77); 2, Mr F. Brown (76); 3, Mr M. Butcher (78). **A.O.V. coldwater:** 1, Mr Stoll; 2, Mr A. Tattersoll (B. Cleve); 3, Mr Wood (Glasowater). **Breeders livebearers:** 1, Mr J. Wheeler; 2, Ann Davis; 3, Mr D. R. Stevens (B. Cleve). **Breeders egglayers:** 1, B. and F. Hirst (Covestry); 2, Mr J. Wheeler.
Catfish: 1, Mr G. Carter; 2, Mr Squibb; 3, Mr P. Jenkins. **A.O.V. catfish:** 1 and 2, Mr J. Turner; 3, Mr R. Gorwill. **Rashoras, danios and minnows:** 1 and 2, Mr R. W. Hill; 2, Mr D. Warrmann, Loaches, bettas: 1, Mr R. W. Hill; 2, Mr D. Noble; 3, Mr and Mrs Baylons. **Egglaying tooth-carp:** 1, Mr G. Carter; 2 and 3, Mr G. Churchill. **A.O.V. egg-layers:** 1, Mr J. Hamon; 2 and 3, Mr P. Plover.
Breeders, egg-layers: 1 and 2, Mr R. Gorwill; 3, Mr G. Churchill. **Breeders, livebearers:** 1, Mr R. Wilkie; 2, Mr R. W. Hill; 3, Mr D. Noble. **Sexed pairs:** 1, Mr R. Wilkie; 2, Mr B. Stoll; 3, Mr D. Warrmann. **Furnished jars:** 1, Mr J. Turner; 2, Mr T. Phillips; 3, Mr P. Harley. **Junior, egg-layers:** 1, M. Wilkie; 2, A. Ward; 3, H. Jones. **Junior, livebearers:** 1 and 2, M. Wilkie; 3, D. Plover.

THE BEST fish in the show, judged from 450 entries at the **ALFRETON & D. A.S.** open show, was a mollie entered by Mr J. Igoe of Sherwood. Details of the results are as follows:

Guppies: 1, Mr P. Duffy; 2 and 3, Mr S. Buchanan. **Platy:** 1, 2 and 3, Mr J. Lyall. **Swordtails:** 1, Mr W. Selby; 2, Mr D. Hartley; 3, Mr Godsbere. **Mollies:** 1, 2 and 3, Mr J. Igoe. **Barbs, snail:** 1, Mr J. Wright; 2, Mr and Mrs Cohen; 3, Miss Gerrard. **Loops:** 1, Mr S. Hill; 2, Mrs Hebert; 3, Mr J. Hepinstall. **Characins, snail:** 1, Mr M. Allop; 2, Miss Gerrard; 3, Mr J. Wright. **Loops:** 1, Mr J. A. Stiff; 2, Mr B. Hicks; 3, Mr D. Savell.

THE AQUARIUM SHOW 1970

AQUARIUM societies participating in the Society Tableaux and Furnished Aquaria section of the **AQUARIUM SHOW 1970** (Thursday 29th October to Sunday 1st November at the Royal Horticultural Society Old Hall, Vincent Square, London S.W.1) will be competing for awards of £25 (first), £15 (second) and £10 (third), and all entering societies receive £5 towards the expenses of their tableaux. Judging the Tableaux section this year will be done by a new procedure. Full details of the tableaux and entry forms can be obtained on application to the Show Organiser, The Aquarium Show 1970, 554 Garratt Lane, London S.W.17 (phone 01-947 2803).

Entry to the competitive classes for individual fishes (23 tropical classes, 3 coldwater classes) is open to all aquarists and a list of the classes and an entry form will be sent on request, from the above address.

Killifish: 1, Mr Booth; 2, Mr Stiff; 3, Mr D. Sewell. **Minnows and danios:** 1, Mr J. Hepinstall; 2, Mr R. Clarke; 3, Mr M. Allop. **Sharks and loaches:** 1, Mr J. Derris; 2, Mr R. Harlow; 3, Mr J. B. Eichen. **Rashoras:** 1, Miss Hill; 2, Miss Gerrard; 3, Mr D. Wang. **Dwarf cichlids:** 1, Mr J. Hepinstall; 2, Mr J. Derris; 3, Mr W. Selby. **Loops:** 1, Mr J. Wright; 2, Mr M. Cox; 3, Mr D. Sewell. **Angels:** 1 and 2, Mr D. Sewell; 3, Mr M. Allop.
Catfish: 1, Mr C. Cooper; 2, Mr J. Jordan; 3, Mr S. Buchanan. **Loaches:** 1, Mr J. R. Eichen; 2, Mr W. Morrell; 3, Mr E. Lyall. **Siamese fighters:** 1 and 2, Mr J. Fallows; 3, Mr and Mrs Cohen. **A.O.V. anabantids:** 1, Mr Hopkinson; 2, Mr R. Harlow; 3, Mr W. Merril. **A.O.V. tropical:** 1, Mr J. Hepinstall; 2, Mr J. Derris; 3, Mr E. C. Snodder.
Pairs, Egg-layers: 1, Mr Hans Kuhn; 2, Mr E. Igoe; 3, Mr M. Allop. **Livebearers:** 1, Mr Godsbere; 2, Mr S. Buchanan; 3, Mr P. Reynolds. **Junior, Egg-layers:** 1 and 2, G. Thickbroom; 3, A. Kaye. **Livebearers:** 1, Master Igoe; 2, Master Duffy; 3, J. Senior. **Goldfish and comets:** 1, Mr C. Asquith; 2 and 3, Mr E. Maloney. **Shubunkin and fancy goldfish:** 1, Mr C. Asquith; 2, Mr C. Hill; 3, Mr G. Thickbroom. **A.O.V. coldwater:** 1 and 2, Mr C. Hill; 3, Mr G. Thickbroom. **Breeders, Egg-layers:** 1, Mr Cuff; 2, Mr Hans Kuhn; 3, Mr J. Igoe. **Livebearers:** 1, Mr P. Duffy; 2, Mr P. Reynolds; 3, Mr and Mrs Cohen. **Novice:** 1, Miss Igoe; 2, Mr Booth; 3, Mr Power.

OUTSTANDING results of the LLANTWIT MAJOR A.S. open show reported last month are now available:

Corydoras and livebearers: 1, Mrs Williams; 2, Miss Jones; 3, Mr A. Robertson. **Junior, Egg-layers:** 1, Master D. Poyer; 2, Master R. Williams; 3, Master R. Gordon. **Livebearers:** 1, Master D. Poyer; 2, Miss P. Welch; 3, Master R. Williams. **Rashoras:** 1 and 2, Mr R. W. Hill; 3, Mr A. Lewis. **Danios and minnows:** 1, Mr Lamberick; 2, Mr N.

Llewellyn; 3, Mr F. Brown. **Loaches:** 1, Mr F. Brown; 2, Mr R. W. Hill; 3, Mr Parnford. **A.O.V. egg-layers:** 1 and 2, Mr P. Plover; 3, Mr W. Hill.
Pairs: 1, Mr Wilkie; 2, Mr R. Wilkie; 3, Mr R. Wigg. **Guppies, Male long tail:** 1, Mr R. S. Hours; 2, Mr Newnham; 3, Mr C. Mann. **Female:** 1, Mr Braston; 2, Mr D. Jones; 3, Mr C. M. Jones. **Swordtail:** 1, Mr Scudamore; 2, Mr T. Hodges; 3, Mr R. W. Hill. **Platy:** 1, Mrs Mitchell; 2 and 3, Mr A. Robertson. **Molly:** 1, Mr C. Mann; 2, Mr Scudamore; 3, Mrs M. Williams. **Breeders egg-layers:** 1, Mr Trowgold; 2, Mr Batesman; 3, Mr Churchill.

Mr R. Wigg has been awarded honorary life membership by Cardiff, Penarth and Rhondda aquarist societies and the scrolls and club badges were presented to him at the open show.

FOR the fifth year in succession the weather was exceptionally warm and sunny for the **SWILLINGTON A.S.** open show, enabling many exhibitors to sunbathe and eat their refreshments in the grounds of the school where the show was held. There were over 500 entries with exhibitors from more than 30 societies, eight independent entrants and many local non-fishkeeper visitors. Prizes were presented by Professor R. McN. Alexander of the Department of Zoology, University of Leeds. Competition for the 30 in.-high Duralife Trophy was even keener than last year with more than six very large and strong show teams competing for it. It was won by Castleford A.S. (23 points); 2, Dukeries, 16; 3, Sherwood, 13; joint 4, Alfreton, last year's winners, and Swillington, 11. A clown loach entered by Mr D. Jackson of Dukeries was judged to be the best exhibit in the show and Mr Jackson received a gold pin, the A.Y.A.S. Diploma and the L. Longfellow trophy for best catfish or loach. Miss J. Helm received the Swillington Ladies trophy for the lady with the highest pointed exhibit. Mr A. Hirst received the Coal Reef Aquaria trophy for the best breeders exhibit and Mr M. Allop received the Jessie Reynolds trophy for best pair of fish. Detailed results were:

Guppies: 1, Mr H. Gardner (Aireborough); 2, Mr S. Buchanan (Sherwood); 3, Mr L. Longfellow (Swillington). **Mollies:** 1 and 2, Mr J. Igoe (Sherwood); 3, Mr A. Douglas (Hall). **Platy:** 1, Mr Burton (Privatons); 2, Mr I. Hepinstall (Castleford); 3, Mr W. Cook (Doncaster). **Swordtails:** 1, Mrs Cohen (Castleford); 2, Mr D. Eickon (Swillington); 3, Mr and Mrs Stannup (Aireborough). **A.O.V. livebearers:** 1, Mr J. Blamires (Huddersfield); 2, Mr A. Hirst (Chapelown); 3, Mr J. A. Whitley (Aireborough).
Tooth-carp: 1, Mr B. Blackburn (Sherwood); 2, M. M. and A. Cowther (Swillington); 3, Mr J. Haly (Cleveland). **Fighters:** 1, Mr and Mrs Gates (Castleford); 2, Mr F. Penanby (Knottingly); 3, Mr Hutchinson (Dukeries). **A.O.V. anabantids:** 1, Mr J. Doolley (Huddersfield); 2, Mr Parvia (Hall); 3, Mr and Mrs Better (Castleford). **Corydoras:** 1, Mrs Springer (Swillington); 2, Mr A. S. Allison (York); 3, Mr and Mrs Grimshaw (Sunnybrow). **A.O.V. catfish and**

luch: 1, Mr D. Jackson (Dukeries); 2, Miss J. Helm (Horsforth); 3, Mr A. S. Allison (York).

Characins, Small: 1, Mr J. Derris (Dukeries); 2 and 3, Mr M. Ashop (Airestone). Large: 1, Mr D. Bousset (Dukeries); 2, Mr. and Mrs. Batten (Castleford); 3, Mr G. Tricklebrow (Castleford). Cichlids, Small: 1, Mr K. Willsham (Duram); 2, Mr J. Derris (Dukeries); 3, Mr J. A. Whitley (Airestone). Large: 1, Miss J. Helm (Horsforth); 2, Mrs Stringer (Swillington); 3, Mr M. Woodley (Dukeries). Barbs, small: 1 and 2, Mr J. Wright (Airestone); 3, Mrs Stringer. Large: 1, Mr M. Woodley; 2, Mr J. Shelton (Knottingly); 3, Mr D. South (Tadcaster). Sharks and foxes: 1, Mr A. Haver (Chapelown); 2, Mr J. Scall (Selby); 3, Mr W. Gibson (Huddersfield). Rubens, danios and minnows: 1, Mr J. Haly (Cleveland); 2, Mr M. Purvis (Hull); 3, Mr H. Clarke (Shearwood). A.o.v. tropical: 1, Mr E. Whitlock (Tadcaster); 2, Mrs Helm (Horsforth); 3, Mr J. Heptinstall (Castleford).

A.o. coldwater: 1, 2 and 3; Mr C. Asquith (Castleford). Pairs, Livebearers: 1 and 2, Mr H. Gardner (Airestone); 3, Mr J. Iape (Shearwood). Egg-layers: 1, Mr M. Ashop; 2, Mrs Cohen (Castleford); 3, Mr D. Bousset (South Leeds). Breeds, Livebearers: 1, Mr W. Gibson (Huddersfield); 2, Mrs Cohen; 3, Mr H. Gardner. Egg-layers: 1, Mr A. Hirst (Chapelown); 2, Mr E. Wells (Duncliffe); 3, Mr L. A. Darden (Grisely). Furnished jars: 1, Mr B. Magnus (Airestone); 2, Mr R. Shanks (Mount Pleasant); 3, Mr J. Robertson (Mount Pleasant).



At the Swillington A.S. open show Professor R. McN. Alexander (left) presented the prizes. Here the Duralife Trophy won by Castleford A.S. is being presented

In Brief . . .

... **CARDIFF A.S.** are holding a publicity evening on 20th October. A slide show, displays of equipment, tank set-ups etc. will be on display to the general public to interest them in the hobby. At the meeting on the 24th September members will be entertained by a slide show given by a representative from the British Killifish Association.

... **ALTHOUGH** the July meeting of **WEYMOUTH & D.A.S.**, held at the New Inn, Portland, was to be a social evening some very interesting aquatic discussions arose out of the questions and answers given to the quiz. The table show for a.o.v. tropical was won by Mr C. Carter (2 and 3, Mr P. Carter).

... **BELLE VUE A.S.** very much enjoyed the tape and slide show by Mr Jim Kelly that their chairman, Mr S. Taylor, presented at the July meeting. Mr Kelly spoke of the differences between the British and American attitudes to the hobby—the American being rather more commercially minded, but it was noted enviously that a 'local' American club show could entice 60,000 members of the public to attend! Mr G. Thompson judged the table show. Mrs Millar won in the senior class with an Egyptian mouth-breeder (2 and 3, Mrs Heap); Miss Millar was first in the junior class with an *Aptotoglossa aquatica* (2 and

3, Master Gee). Mr R. E. Legge, superintendent of Belle Vue Zoological Gardens and president of Belle Vue A.S., will give a talk on how to set up a furnished aquarium at the September meeting.

... **HEMEL HEMPSTEAD A.S.** have now been meeting in their new hall since the end of June and at the first meeting in the new venue an auction was held. A recent table show was judged by members of the club in groups and results were: Juniors furnished: 1, G. Trenwith; 2, D. Whiby, J. Whiby, Raabera; 1, Mr T. Craddock; 2, Mr E. Leavy. *Molliesia*: 1, Mr P. Tucker; 2, Mr and Mrs Collins; 3, Mr P. Tucker, Mr and Mrs Collins. Pianos: 1, Mr and Mrs Collins; 2, Mr I. Sellick; 3, Mr and Mrs Collins. Mr I. Sellick. Coldwater: 1, Mrs V. Leavy; 2 and 3, Mr E. Leavy.

... **WHITCHURCH & D.A.S.** held their first club table show at the Archibald Worthington Club at the end of June. Mr Prichard from Wrexham judged the show and awarded first place to Mr H. Harris (dwarf gourami, 90); 2, Mr J. Phillips; 3, Mr B. Humphries. Members have also enjoyed a trip to Chester Zoo Aquarium where there they were able to look behind the scenes at the filtration system etc.

... A GOOD attendance with some new faces made the July meeting of **CARSHALTON & D.A.S.** a successful evening. The judge/speaker Mr

Cyril Brown gave some lighthearted views of fishkeeping plus some invaluable and first-hand information on killifish illustrated by slides of his own fish. Table show winners were: *Corydoras* and *Brochis*, 1, Mr D. Pilgrim; 2, Mr C. Lamb; 3, Mr N. Tucker. *Botia* and loaches: 1, Mr I. Davies; 2, Mr C. Lamb; 3, Mr J. Dixon.

... **YEOVIL & D.A.S.** 'took a thrashing', reports treasurer Mr C. H. Bushell, at their inter-club show with **WESTON-SUPER MARE A.S.** when they were beaten by 83 points to 56. The 14 classes were judged by Mr T. Callow, Mr F. Grogan and Mr E. Short from Bath A.S. The quiz organised by Mr Hulbert was won by Mr K. Forward, Miss Forward being the junior winner.

... **WHEN** Mr Ken Nutt judged at **BRIGHTON & SOUTHERN A.S.**, members of the Society thought their vote of thanks well earned as Mr Nutt arrived to carry out his task in spite of the fact that his car had broken down on the way. Mr Mike Whittington took first place in the dwarf cichlid class with a *P. thosani* and Mr Paul Tee was placed first in the a.o.v. with a Jack Dempsey. When the club held its quarterly Bring and Buy Sale a good selection of quality stock disappeared rapidly to the accompaniment of ferocious financial bidding. Later in the month Mr Brian Baker of Uxbridge A.S. judged the annual

table show for breeders classes. First place in the livebearers class was awarded to Mr Vic Aldis (wagtail platys) and in the egglayer class to Mrs H. Maddison (keeri gouramis).

... **YATE & D.A.S.** were very pleased to welcome Mr Frank Pulman of Stockton-on-Tees to their July meeting. Mr Pulman is a catfish enthusiast. The programme consisted of a double slide show, one showing exotic marine fishes of the Great Barrier Reef and the other livebearers from Nature through to man's hybrids. Table show winners were: Furnished jars: 1, Mr R. Bishop; 2, Mr C. Webb; 3, Mr S. Green. Danios, rasboras, minnows (Open): 1 and 2, Mr D. Noble; 3, Mr K. Winters; (novice): 1 and 3, Mr D. Waters; 2, Mr R. Bennett.

... **SMETHWICK & D.A.S.** are now well established in their new club room at Arden Road School and have interesting fortnightly meetings on Wednesdays. Meetings scheduled are 29th July, 12th August, 26th August and so on up to 30th December.

... **MEMBERS OF NOTTINGHAM & D.A.S.** are disappointed at having to cancel their open show this year. Unfortunately the town's own celebrations of 500 years of its history has meant that every available hall has been booked. However, Mr B. Inman for the show committee assures us 'business as usual in 1971'.

... **COMPETITION** winners at **INDEPENDENT A.S.** have been: Fancy goldfish: 1, Mr T. Beaumont,

British native and foreign cold-water: 1 and 3, Mr J. Kettle; 2, Mr T. Beaumont. Frank Tomkins Challenge Cup: 1, Mr T. Kinsley; 2, Mr M. Harth; 3, Mr J. Kettle.

... **MEMBERS OF YORK & D.A.S.** have been very successful in two rounds of the Ingamell's Cup

competition during the summer. Twenty-nine members journeyed to Scarborough to accept the Scarborough A.S. challenge and took 29 of the first three places in 12 classes. In the Society's match with Hull, York were again successful. There were 101 entries and York won the match by 50 points to 15.

Dates for Your Diary

26th September. **F.R.A.S.** General Assembly, Conroy Hall, Red Lion Square, London W.C. 1.

26th September. **YATE & D.A.S.** Open Show, Christchurch Hall, North Street, Downend, Bristol. Details from Mr C. E. Stirkland, 20 Burgess Close, Chipping Sodbury, Bristol BS17 8EL.

26th September. **BETHNAL GREEN A.S.** Birthday Show.

26th-28th September. **MID-HERTS A.S.** Open Show (Hertfordshire Horticultural Society Show), Francis Bacon School, Denkes Drive, St Albans.

26th September. **WEYMOUTH & D.A.S.** Open Show. Details from Mr Hatton, 53 Bowdoin Street, Weymouth.

26th September. **CLEVELAND A.S.** 13th Open Show, British Legion Hall, West Gate, Guisborough, Yorks. Schedules from Mrs Ayres, 7 Donet Road, Guisborough, Yorks.

26th September. **MID-SUSSEX A.S.** Tropical Fish Exhibition, 10 a.m.-6 p.m. The Park Centre, Park Road, Burgess Hill, Sussex.

14th September. **HARWICH & D.A.S.** Annual Exhibition of Tropical Fishes at Queens Hotel, High Street, Dovercourt, Essex.

14th September. **HOUNSLOW & D.A.S.** Open Show, Hounslow Youth Centre, Cecil Road, Hounslow, Middlesex. Schedules from Mr D. J. Woodward, 24 Uxbridge Road, Harworth, Middlesex.

17th September. **BRIGHTON & SOUTHERN A.S.** 26th annual Open Show, Marston Centre, Marston Road, Hove, Sussex. Schedules from Mr Roy Browning, 24 Rowan Close, Portside, Brighton (Brighton 49911).

17th September. **WARRINGTON A.S.** Open Show, St Benedict Y.C. Bell Hall, Orford Lane, Warrington, F.N.A.S. Judges. Schedules from Mr J. Higham, 42 Hood Lane, Sarnley, Warrington (phone 25936).

17th September. **RADLETT SECTION OF THE FANCY GUPPY ASSOCIATION** Open Show, Scouts Hut, Boreham Wood, Herts.

26th September. **FOUR STAR A.S.** Open Show, Hemsworth High School, Station Road, Hemsworth. Details from Mr J. Rhodes, 105 Burnley Road, Hemsworth.

26th September. **STONE A.S.** Open Show, Walton Community Centre, Stone, Staffs. Schedules from Mr N. Flatt, 18a High Street, Stone, Staffs.

26th September. **OLDHAM & D.A.S.** Open Show, Music Room, Werneth Park, Oldham, Lancs, Breeding 12.30-2.15. (This is also an A.M.D.A.S. show.) Schedules from Mr J. C. Williams, 3 Queen Street, Shaw, Lancs.

26th September. **REIGATE & REDHILL A.S.** Open Show, Coleman Institute, Redhill, Surrey. Schedules from Mr J. Wood, 22 Rickman Hill, Coulsdon, Surrey CR3 1DN.

26th September. **RIVERSIDE A.S.** Open Show, St Ethelredus Church, Fulham Place Road, Fulham, London, S.W.6. All enquiries to Mr M. Goss: phone 01-738 6140.

26th September. **BRACKNELL A.S.** Open Show, Froxwood Community Centre.

27th September. **NORTHAMPTON & D.A.S.** Open Show. Schedules from Mr B. Edwards, 58 Dovecote Road, Roade, Northamptonshire.

27th September. **TORBAY A.S.** Open Show, Torquay Town Hall. Schedules from Mr L. Doubleday, 69A Newton Road, Torquay.

CONGRATULATIONS to the **AQUARIUM SOCIETY OF VICTORIA (Australia)**. Their problems in obtaining a permanent meeting place have been many and varied over the years and now after 13 years of planning and saving and tremendous effort on the part of the Building Committee, the Society's representatives have bid successfully at auction and purchased their own Club Rooms.

Meetings and Changes of Officers

AIREBOROUGH & D.A.S. Meetings: first Thursday of each month at 8.0 p.m. in the Co-op, Hall, Guiseley, nr Leeds. Secretary: Mr G. E. Walker, 2a West End Terrace, Guiseley, nr Leeds LS20 8LN.

CARDIFF A.S. Chairman: Mr R. S. Chard; vice-chairman, Mr H. Humphreys; treasurer, Mrs P. Harding; secretary, Mr G. Churchill (13 Montgomery Street, Roath

Park, Cardiff); librarian, Mr E. Townsend. Meetings (change of venue): Rupperra Arms, City Road, Cardiff.

SMETHWICK & D.A.S. Meetings: Fortnightly on Wednesdays (29th July, 12th August, 26th August etc.) at Arden Road School at 8.0 p.m. Details from secretary Mr W. Downes, 173 Arden Rd, Smethwick, Warley, Worcs.

The AQUARIUM SHOW 1970

29th OCT—1st NOV at the Royal Horticultural Society's Old Hall, London S.W.1

27th September. **STROUD & D. A.S.** Convention, Mid-Gloucestershire Technical College, Stroud. Lectures by Dr Cohen and Dr Belamy. Film Show. Enquiries to Miss J. Smith, The Prince of Wales, Cashes Green, Stroud, Glos.

27th September. **HUCKNALL & BULWELL A.S.** Open Show, Bulwell Youth Club, Coventry Road, Bulwell. Bunching 12-3 p.m. Family film show. Schedules from Mr M. Harrington, 5 Greenwood Vale, Hucknall, Notts.

2nd October. **EAST LONDON AQUARISTS AND FONDKEEPERS ASSOCIATION** Open Show, Kippax Road School, Barking, Essex.

4th October. **EALING & D. A.S.** Open Show, Northfields Community Centre, Northover Road, London, W.11. Doors open approx. 2.30 p.m. Refreshments. Enquiries to Mr T. B. Cooper, 7 Nerhouse Road, London, W.3.

10th-11th October. **BRITISH AQUARISTS FESTIVAL**, Belle Vue, Manchester. Saturday 10-8. Sunday 10-7. Schedules from Mr G. W. Cooke, Spring Grove, Field Hill, Batley, Yorks.

17th October. **G.S.G.B. CONVENTION** and Open Show, St Marks Church Rooms, Belgrave Gate, Leicester, at 2.30 p.m.

Details from Mrs P. Whittington, Pines Lodge, Ringley Park Avenue, Reigate, Surrey.

17th October. **BRENT A.S.** Open Show. Sydney Memorial Hall, High Road, Willesden, London, N.W.2. Details from Mr A. J. Raymond, 39 Inman Road, London, N.W.16.

18th October. **SHERWOOD A.S.** first Open Show, Ladybrook Community Centre, Ladybrook Lane, Mansfield, Notts. Schedules from Mr J. Egan, 25 Marple Avenue, Mansfield Woodhouse, Notts.

24th October. **KINGSTON & D. A.S.** Open Show. Schedules from Mr G. Greenhalf, 10 Garth Close, Morden, Surrey.

29th October-1st November. **THE AQUARIUM SHOW '70**, Royal Horticultural Society Old Hall, Vincent Square, London, S.W.1.

31st November. **ASSOCIATION OF YORKSHIRE AQUARIST SOCIETIES** 'Aquarist Fair', The Victoria Hall, Victoria Park, Keighley, York.

8th November. **HEYWOOD & D. A.S.** Open Show, Ambulance Hall, Bunsford Road, Heywood, Bunching 12 noon-2.0 p.m. Details from Mr A. Evans, Birnham Close, Unsworth, Nr Bury, Lancs.

14th November. **HENDON & D. A.S.** Annual Congress, Whitefield Secondary Modern School, Claremont Road, Hendon, London, N.W.2. Tickets (16 adults) from Mr R. Maynard, 50 Cornwell Gardens, London N.W.2.

29th November. **AIREBOROUGH & D. A.S.** Open Show, Greenacre Hall, Rowden. Schedules from Mr G. E. Walker, 21 West End Terrace, Guiseley, nr Leeds, LS20 8LX (45 classes, 48 plaques plus trophies).

6th December. **HORSFORTH A.S.** Open Show, Greenacre Hall, Rowden, nr Leeds. Bunching 12.30-2.30 p.m. Schedules from Miss J. Helm, 29 Wellington Road, Leeds LS12 1EE (phone Leeds 21024).

12th December. **F.R.A.S.** Annual General Meeting, Conway Hall, Red Lion Square, London, W.C.1.

1971

21st March 1971. **TOP TEN A.S.** Open Show, Huddersfield Town Hall.

27th April 1971. **BURY & D. A.S.** Open Show, Church House, The Wyke, Bury.

26th June. **SWILLINGTON A.S.** Open Show.

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- Hykro Plastic .. 6

FILTERS

- Windmill Premier Biological Filters (5) 18x10 in. .. 13 9
- (L) 24x12 in. .. 14 6
- Windmill Regent .. 11 0
- Windmill Consort .. 21 6
- Internal Corner Gro-Wel Bottom Bubble-up .. 11 3
- Hykro Jr. Bottom .. 5 0
- Hykro De Luxe .. 13 4
- Halvin Filterfast Jr. .. 34 6
- Halvin Filterfast Sen. .. 57 0
- Gro-Wel Bubble-up .. 43 7
- Champagne outside Super Bottom Filter .. 10 4
- Corner Bottom Filter .. 9 4
- Mini Bottom Filter .. 7 4

FILTRATION ACCESSORIES

- Datam glass wool 1 3, 2 6
- Datam glass silk .. 1 3
- Datam filter carbon 1 3, 2 6
- Datam Ag. peat .. 1 3
- Nylon Filter Medium .. 1 6
- Datam Filter Pads .. 1 6
- Incer-Pet Polymer wool .. 1 6
- Hornby's Clear-View .. 5 0
- New-Vista Glass Filter Wool .. 2 0
- Filter Carbon .. 2 0
- Tonic Salts .. 2 6
- Aquarium Peat .. 2 0
- Glass Wool Tissue .. 2 0
- "MSM" Man-made Fibre Wool .. 2 0
- Synch Nylon Wool 3/4 14-24-3 0
- Synch Carbon .. 3 0

CLEANING EQUIPMENT

- Windmill Air Rejector .. 11 0
- Windmill Super Air Rejector .. 17 0
- Windmill Hand Rejector .. 16 4
- Windmill Hand Rejector spare bags .. 1 8
- Windmill Air Rejector spare bags .. 1 8
- Windmill Hand Rejector spare bulbs .. 3 0
- Hykro 3-in-1 scraper .. 3 0
- Windmill Fishtail Syphon .. 2 2
- Eheim tubing per yd. .. 3 0
- Windmill Dip Tube 15 in. .. 3 9
- Hykro take-apart sediment remover 12 in. .. 3 9
- 15 in. .. 4 0
- Secca Tonge .. 6 4
- Planting Sticks .. 3 3
- Aristocrat Algae Scraper .. 3 6
- Hykro Algae Scraper .. 3 6
- Aquarium Kit (planter, scraper) .. 4 4

WHITEWORM CULTURE

- Small .. 5 0

HEATER HOLDERS

- Adjustable Heater Holder .. 2 3
- Heater Bracket .. 2 0
- Uno Uni-clip Heavy Moulded Plastics .. 1 4
- Spare Knob Suckers for heater holders .. 4 4

NETS

- Green Nylon nets: 3x2 1 6 4x3 2 0 5x4 2 6 6x5 3 0 9x7 5 0
- White Terylene nets: 3x2 2 6 4x3 3 0 5x4 3 6 6x5 4 0 9x7 6 3
- Brine Shrimp or Daphnia nets: 3x2 1 9 4x5 2 9 3x4 2 6 5x6 3 0
- Wooden handles 7x9 6 3

BREEDING TRAPS

- Windmill combined breeding and rear- ing .. 21 4
- Hykro 3-in-1 .. 7 0
- Reliant 3-in-1 .. 15 0
- Gro-Wel 5-way American .. 27 8
- Hykro fish breeders, fine and coarse .. 6 0

AQUAMASTIC

- 1 lb. tin 2 9+p. & p. 2 4
- 2 lb. tin 4 6+p. & p. 3 0
- 4 lb. tin 7 0+p. & p. 4 4
- 7 lb. tin 10 9+p. & p. 6 0
- 14 lb. tin 19 9+p. & p. 9 0

DUROGNOST

- Water hardness testing kit .. 20 0
- Spare tablets Pkts. of 10 Strength N.I. or N.S. 2 0
- Indicators each .. 6 0

COLORMETER P8

- pH testing kit .. 42 9

MISCELLANEOUS

- Hykro Aqua Sealer .. 2 4
- Hykro Leak Stopper .. 1 6
- Silicone sealer .. 19 6
- Hykro Brine Shrimp Hatcher .. 13 6
- Hykro pH tester .. 5 6

MIRACLE FOODS

- Miracle Fairy Shrimp .. 5 9
- Miracle Red Worms .. 5 9
- Miracle Gordon's Formula .. 5 3
- Miracle Red Worms .. 6 3
- Miracle Tubifex with Chlorella .. 4 9
- Miracle Daphnia .. 3 9
- Miracle mosquito larvae .. 5 9
- Miracle freeze-dried worms .. 3 0
- Miracle freeze-dried brine-shrimp .. 5 9
- Miracle Liver Treat .. 7 6
- Miracle Fish Nip .. 4 0
- Miracle Goldfish Treat .. 4 0
- Miracle Mosquito Larvae .. 5 9

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