You can be sure of healthy fish growth with TetraMin.

Fish growth has been proved to depend mainly on the quality of the food, not only on the frequency and quantity of feeding. Watch how fish fed on TetraMin grow; cheap fish food may even be hazardous to their life. Constant tests, using fish food from all over the world, have proved that TetraMin is the most nutritious flake food you can buy. Perhaps the healthy growth of fish is the secret of TetraMin's success?

TetraMin means longer life for your fish
Comments and Quotes

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

How Big?

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

Like Dad's Army, any group of animals contains the long, the short and the tall, and to make the 'Lotties' ('Lengths' for fish?) the yardstick for the others is not doing justice to the species, to say the least. 'Length reached in the wild state' is a magic formula for some people with the Ford car approach to fish lengths, but in fact fish in the wild are likely to be subject to factors causing even greater variation of measurements and hence alteration of the average size. Average length under best aquarium conditions in many instances might well prove to be above average length for the wild fish. Although there is no direct correlation between age and size where fish are concerned, since well-kept aquarium specimens of many types almost certainly attain greater ages than fish in their native waters, there is much greater likelihood of the tank fish achieving the best size within its capability. But we see no sense at all in preoccupation with size, particularly where development of that feature to an admired extent has involved some technique that is over and above usual fishkeeping practice. Come to think of it, on these grounds there could be a case for penalising some of the big "uns seen at shows.

Dr Earl S. Herald

IT is with regret that we report the death of the distinguished American aquarist and marine biologist Dr Earl S. Herald, Curator of the famous Steinhart Aquarium in San Francisco, a position he had held for many years. Earl Herald had been a particular asset to aquarium-keeping in the U.S.A., by his interest in writing about fishes for aquarists in books and American journals, especially in the now-defunct The Aquarium Journal. His book Living Fishes of the World was published in Britain in 1961. It is reported in the Salt Water Aquarium Magazine that Earl Herald died whilst underwater Scuba diving off Baja, California in search of a rare pipefish.
Spawning the Semi-tropical Medaka

By A. B. Britton

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

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

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

From the plants removed from the parents' tank, about 100 tiny babies hatched out more or less at once. With Liquifry and Tetramin Baby Food they thrived for a time and then began to die off. When nearly all had died I realised that the fine food could be suffocating them, especially in a small container. I also began to think they needed some heat, so by now our central heating was off for the summer. When nearly all of them had faded away I discovered two fairly big ones, much larger than any of the main batch, swimming about quite happily in a bucket that I use to dump snails in, kept over the gas-stove in the kitchen and therefore quite warm. I feed this semi-wild collection of snails only every week or so with a pinch of Tetramin so that the water has remained crystal-clear for years. This gave me the clue that the babies needed some heat and no Liquifry.

So when the next seventy or so hatched out I put them in a plastic bucket with heating up to 72°F, aeration, no Liquifry and fine hard-boiled egg yellow and Tetramin Baby Food four times a day. Nearly all survived. Now I have 35 with the parents and about 35 on their own with two X-ray fish, who had been bullied by tiger barbs and needed a refuge. Both tanks are heated up to 78° and the parents seem quite happy now at this temperature. I have had the young-only tank as high as 80°F once by mistake without any apparent signs of discomfort.

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

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

Continued on page 176.
KEEP IT CLEAN

with Polymer Wool
InterPet Polymer Filter Wool removes the fine particles without impeding water flow. It is a textured synthetic material and so no harmful glass slivers can enter the aquarium — or your fishes gills! InterPet Polymer Filter Wool does not disintegrate, and can be washed and re-used time and time again.

Recommended Retail Prices:
9p  2oz  4oz  1lb
33p  63p  £2.00

Interpet
for trouble-free fish keeping!

and Activated Carbon
InterPet Activated Filter Carbon is a bone carbon and therefore, heavier than water. It has a high absorptive factor for maximum performance. This is a top quality product and should not be confused with wood carbons which float and have poor absorptive performance.

Recommended Retail Prices:
4oz  1lb  2lb
14p  48p  94p

Both products are recommended for ALL air operated and power filters.

Curtis Road Industrial Site
Dorking RH4 1DP
Tel: Dorking 3202

"I saw your advertisement in PFM"
New PHILLIPS SUPERFOOD

The very latest scientific research into fish nutrition has revealed the exceptionally high vitamin needs of tropical fish.

Based on this research Phillips have produced SUPERFOOD—a completely new concept in fish foods.

Phillips SUPERFOOD supplies a desirable balance of 48% protein with carbohydrate, fat and essential minerals. But most important of all, Phillips SUPERFOOD is enriched and fortified to meet as closely as possible the specially high vitamin requirements of freshwater and marine tropicals, as now known.

More and more the hobby aquarist looks to Phillips for the finest fish foods. Now with the introduction of SUPERFOOD you have a luxury high-vitamin flaked food, at a realistic price, which you can use with confidence for all your tropical and marine fish.

Phillips SUPERFOOD provides:

VITAMINS
vitamin A
vitamin D
vitamin E
vitamin B1
vitamin B12
nicotinamide
pyridoxine

MINERALS
calcium
potassium
sodium
magnesium
iron

AMINO ACIDS
arginine
lysine
isoleucine

GUARANTEED ANALYSIS
Minimum crude protein 68%
Minimum crude fat 3%

INGREDIENTS
liver meal,
fish meal,
meat meal,
meal,
poultry,
high-protein wheat flour,
extra lean meat,
beef collagen,
dried milk,
dried blood,
dried yeast,
cold liver P.L.

Phillips Yeast Products Ltd., Park Royal Road, London, NW10 7JX

Please mention PFM when writing to advertisers
Scientifically advanced nutrition for tropical fish.

PHILLIPS SUPERFOOD

EXTRA HIGH VITAMIN FLAKED FOOD FOR ALL FRESHWATER TROPICALS AND LITTLE FISH

2½ oz 62p, 1¼ oz 36p, 6 oz £1.52, Trial Size 20p

"I saw your advertisement in PFM"
A REALLY FIRST CLASS RANGE OF
AQUARIUM PUMPS

Make sure your pump has the "Rosewood" guarantee

AQUA PULSE
Ideal for that small or medium tank
(very strong)
£1.52
incl. VAT

GLORY GPI
A precision pump with good output
(exceptionally quiet and fully adjustable)
£2.89
incl. VAT

GLORY G6
A twin outlet terrific output (robust and fully adjustable)
£4.52
incl. VAT

G8500
Four outlet. Ideal for multiple tank or fish house (a real power pump)
£11.93
incl. VAT

ALL BACKED BY FULL MAINTENANCE FACILITIES AND GUARANTEES
Eric Woods (Rosewood) Ltd.
WELLINGTON · TELFORD · SALOP

Please mention PFM when writing to advertisers
INKY SAYS

"If you visit us once, you will want to come again and again so remember the name!"

Just study this map and you can’t go wrong

HENDON AQUATICS

19 FINCHLEY LANE, NW4

Visit us any day of the week from 9.30 a.m. until 6.30 p.m., and by popular request our store is open every Sunday morning from 10 a.m. until 2 p.m.

You can reach me by telephoning 01-203 4829

We guarantee to offer you only top quality fish and plants, at prices you can afford to pay. We have over 50 large aquariums packed with all varieties of tropical fish, beautifully aquascaped with rocks and plants. You will find a complete range of aquariums, pumps, filters and other accessories including all live foods.

We also specialise in coldwater fish for aquaria and ponds, water pumps and plants. A large selection of fibre glass ponds always on show. Expert advice and personal service is given willingly to all customers.

"I saw your advertisement in PFM"
A Guide to Freshwater Aquarium Fishes
George Hervey and Jack Hems

This is an authoritative work of reference for the aquarist who already has some grasp of the fundamentals of aquarium management. It explains how to set up and stock an aquarium and describes a large range of aquatic plants and a still larger range of fishes. It advises on breeding, feeding and the diagnosis and treatment of diseases. 176 pages. 50 colour and 70 black-and-white photographs and diagrams.

From all good booksellers £2.75

In the event of difficulty, direct from Dept. SS Hamlyn House, 42 The Centre, Feltham, Middx, enclosing a cheque/PO for £3.00 which covers despatch and package costs.

The Hamlyn Group

Please mention PFM when writing to advertisers
Your fish will rise to POND PRIDE

Fish feed on the surface from this high protein, vitamin enriched, nutritionally balanced food in large pellet form.

With POND PRIDE you can watch your fish whilst they feed, note their feeding habits and even see small fry enthusiastically nibbling their way through the floating pellets.

Standard pack contains approximately 1,000 pellets — each pellet a single well balanced meal!

Obtainable in a range of containers from 28 to 3,000 grams (Mini Standard Maxi Breeders) from pet shops and garden suppliers everywhere. In case of difficulty write to:

COOPER NUTRITION PRODUCTS LTD
Speciality Division
Stepfield,
Witham Essex. CM8 3AB
Tel. Witham 3851

"I saw your advertisement in PFM"
Make sure your fish get their vitamins—even when they won’t eat.

Scientific investigation into the nutritional requirements of fish has emphasised their need for vitamins. For example, weight for weight, they need 4 times as much Vitamin B₁₂ as we do, 5 times as much nicotinic acid and 16 times as much Vitamin B₃.

Yet fish may be fussy about their food and refuse even the most appetising diet. When this happens try Phillips AQUAVITE.

Phillips AQUAVITE was developed to provide the essential food vitamins—even when fish are not actively feeding. Simply drop an Aquavit tablet into the tank. It’s water soluble and as it dissolves the vitamins are released into the water and absorbed by the fish. By freshwater fish over the gills; by marines in the water they continually swallow.

Phillips AQUAVITE promotes good health, fertility and colour brilliance. And it’s specially recom-mended when introducing new fish into marine aquaria. The vitamins in AQUAVITE not only help to keep the fish healthy, but also stimulate the appetite and so encourage the fish to take normal food.

Phillips AQUAVITE will not cloud the water. 50 Tablets 33p.

PHILLIPS YEAST PRODUCTS LTD,
PARK ROYAL, LONDON, NW10 7RL.
The Playful *Exodon paradoxus*

By BRAZ WALKER

Photograph by the author

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

One of the lesser known tetras, and certainly one of the most strikingly beautiful, is *Exodon paradoxus*. In form it is quite typical of the group, and is immediately recognisable to the initiated as a tetra. The body colour is bright yellow, especially above, and the tail is also yellow with reddish tips. The tip and middle portion of the dorsal are red, the ventrals are mostly bright red and the anterior part of the anal fin is orange to red. The sides are adorned with two large, jet-black spots, one just beneath the front dorsal rays just at midside and the other just at the root of the caudal fin or tail base. Connecting these two intense and striking spots is a bright silver band, which in reflected lights shines in iridescent hues that vary according to the quality and positioning of the light. In Nature, *Exodon paradoxus*, like many of its relatives, swims in very large schools, and in the aquarium it is quite active, moving almost ceaselessly. There is a malevolent playfulness about the creature which is reminiscent of Till Eulenspiegel, the character of German folklore and subject of the Richard Strauss tone poem of the same name (*Till Eulenspiegel’s lustige Streiche* or *Till Eulenspiegel’s Merry Pranks*). Strangely enough, the fate of *Exodon* is often not dissimilar to that of Till, whose practical joking at last led him to the gallows.

While hanging a fish is obviously an impractical idea, ‘hanging’ in this case may mean being relegated to an out-of-the-way aquarium where little harm can be committed, being given away or
otherwise disposed of for the welfare of the other fishes involved, for *Exodon*, despite its beauty, can at times be a relentless tormentor of other free swimming fishes, playfully chasing and nipping them, often until they are seriously damaged. Whereas the fishes which we know as tetras are characteristically equipped with teeth, this beautiful but often ill-mannered fish has better dental equipment than most and has some reluctance to use it in its prankish games.

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

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

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

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

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

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

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

**Spawning the Medaka**

continued from page 166

quite uninterested and was laying eggs the next day.

As the medaka inhabits paddy-fields it is probably a shallow-water fish and seems to keep rather to the surface, although it does forage on the bottom on occasion. This tendency to be at the top of the tank means that the medaka is probably not a good fish for public display aquaria. However it is a charming fish, with lime-green eyes when young, not in the least aggressive (except for my pompous matriarch) and very hardy. It is an odd thing that I haven't yet seen a really good picture of the golden medaka. The one in Hervey and Hems' *FRESHWATER TROPICAL AQUARIUM FISHES* I would not call a good likeness, completely missing the angularity of the profile, and the pointed beak, which is accentuated as the fish matures. Seen from the top and from a distance the juveniles look very attractive and similar to the real thing, and from the top the adult fish have a much more rounded look than in profile.

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

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

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

Points to Look For

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

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

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

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

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

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

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

Culling the Young

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

Of course, you may find some fish that show a particular feature very well; perhaps one has a good colour, an excellent caudal or body shape but fails in some other way. Keep this fish and...
use it to cross with another fish that is good in all respects other than the feature in which this particular fish excels. From the resultant young it should be possible to find a few that carry the good points of both parents.

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

**Obtaining Your Stock**

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

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

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

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

Finally, here is something to illustrate my belief in hard culturing. In the June issue of *FMM* I wrote of the two spawnings of lionheads which occurred during February. From around 1,000 fish regular sorting has reduced the number to just seven fish that I am prepared to keep for my own use, the others being sold to hobbyists interested in this variety of goldfish. The first fish changed colour at 12 weeks of age and this, if a male, will be bred back to its mother, who also made the colour change at around the same age. The remaining young should show an increased tendency to turn gold at an early age. The remaining six fish had all completed this change 4 weeks later.

**Holiday Time**

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

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

During your vacation, provided that the fish are in good health and have been well fed previously, the fish will live off their reserves of fat and be quite safe. In no case are they at risk. The food is abundant and others when there is a shortage. Most living creatures are built to survive these periods of hunger if they are not too prolonged. In fact, it is better to underfeed rather than give an excess of food.

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

**Pond Precautions**

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

If you have such a pool and it contains plants it would be a wise precaution to fill it to overflowing before leaving and then cover with a
Large masses of rushes and irises, such as these growing in a natural pond, can readily develop in small shallow garden ponds. They disperse a great deal of water in dry weather and can be responsible for the water-level falling so quickly that the pond owner might believe a leak has occurred.

Photo: J. ELIAS

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

Larger pools do not present the same problems and it is only necessary to make sure that the water level is high and then cover with Nelson or some similar type of netting to prevent depredations by cats or fish-catchng birds. Prevention is better than cure, and to arrive back from holiday to find that several of your best fish have provided a tasty meal for the neighbour’s feline ‘Tiddles’ is not the best way to end a vacation.

My own pool is kept covered with ½ in. mesh Terylene netting throughout the year and I have never yet lost a fish through anything but natural causes. There is an added advantage to keeping the pool covered: during the autumn wind-blow leaves of all but the smallest kind are prevented from falling into the pool and are easily removed from the netting. One contributory factor towards possible winter pollution of the pond is thereby avoided.

LETTER

To Be or Not to Be—Northern or British

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

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

2. We have not told clubs that they cannot show under northern rules if they are members of another federation—but the Northern Federation have.

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

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

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

Geo. T. LIDDLE

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

To exemplify what I mean, I would imagine that a Queen Anne type of aquarium cabinet in a penthouse flat containing G Plan furniture would make it an item of ridicule, and its occupants would never live it down even if its owners did. Even in the correct furnishing environment such a tank would need to be related very specifically to species one intends to keep. A heavy, ornate frame needs a compelling and vital foil by way of fish, and there are very many popular fishes which would, for one reason or another, fail completely under such conditions. The tinfoil barb is the sort of fish which would very distinctly succeed in a situation like this, whereas angelfish and discus might come off less well on account of their comparative lack of mobility. Marines, by and large, would hold their own by virtue of colour, activeness and size, but not everyone wants the worries of the saltwater world.

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

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

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

By RUDOLPH ZUKAL

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

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

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

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

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

In the photograph on the preceding page the male giant danio is the upper fish. On this page the pictures show pre-spawning and mating phases in the breeding of a pair of giant danios. During the rapid spawning the male is seen to 'hold' the female briefly with his curved caudal
and fast swimmers. They resemble the pearl danio a little in their colouring and, with correctly placed lighting, where it falls slantingly into the tank from front to back, their delicate colouring stands out beautifully. Since they are good jumpers it is very important to keep the aquarium well covered. They are not choosy feeders and take practically any type of food. But it goes without saying that they should be given a varied diet or they will not thrive or reach the desired size.

As I wanted to photograph the spawning I prepared a longish tank planted in a usual manner but with some fine-leaved plants laid in, as shown in the photograph. It is not necessary to use a sand base for the spawning, just small stones layered on the bottom, between which the eggs can fall. This preparation must be made because giant danios are very keen egg-eaters. I prepared the tank with tap water and raised the temperature to 75°F (24°C). From then on the procedure was much the same as that shown by *Brachydanio rerio* and other danias. After the chiseling of the female came the importuning, displaying, stimulating and so on. The actual egglaying takes place at great speed—the male wraps his caudal fin over the hind part of the female, the fish part, and the eggs fall on to the bottom. The eggs themselves are fairly large, slightly golden in colour, and several hundred are laid at a spawning.

The whole process lasts about 3 hours. As soon as the egglaying is completed the adult fish must be removed from the tank so that the eggs are not eaten.

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

---

**Meetings and Changes of Officers**

**BRITISH KILLIFISH ASSOCIATION.**

New membership secretary (Registrar): Mrs. K. B. Brown, Rushton, Elm Grove, Sunbury-on-Thames, Surrey. Secretary, Mr. W. F. F. Cummins.

**BRITISH MARINE AQUARIUMS ASSOCIATION.**


**NEW FOREST ASSOCIATION.**

Secretary, Mr. H. E. T. T. Woolf, 16 Auckland Avenue, Bracknell, Berkshire, Hants, W.12. Meetings: 1st Monday in month. The Community Centre, Bracknell, Hants.

**NEWBURGH & DAS.**

Meetings every 1st Monday, 7.30 p.m., The Town Hall, Newbury, Berks.

**NORTH STAFFS ASSOCIATION.**

New Secretary, Mr. E. T. C. Cozens, 51 Red Lane, Burton-on-Trent.

**THORNTON ASSOCIATION.**

Change of address of Secretary: Mr. D. R. W. Thorpe, 79 Mound Road, Morden, Surrey, M. D. R. Thorpe.

**UNIFIED ASSOCIATION.**

Concerning the Colours of Fishes

By IAN C. SELLICK

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

Do Fishes See Colours?

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

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

Production of 'Physical' Colour

Fish colours can be said to be physical rather than chemical when the physical nature of the surface is responsible for their production. They are due to one of four phenomena: interference, diffraction, scattering, or straightforward reflection. However, colours produced in this way may be modified by 'chemical' colours.

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

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

(b) Orientated silvery layers: The majority of silvery fishes possess, in addition to the s.a., layers of oriented reflecting platelets. These layers are always found outside the s.a. when both occur. The oriented layers are sometimes found immediately inside the skeleton of the scale, e.g. salmon; sometimes outside the skeleton of the scale, e.g. gudgeon; and sometimes deep in the integument and immediately external to the s.a. itself. The oriented reflecting platelets are sometimes confined to a single layer of cells, and sometimes, particularly on the flanks, they are contained in several superimposed layers of reflecting cells. There are considerable differences in the pattern of oriented layers in different fishes. In some fishes the entire surface is covered with oriented reflect-
The glass catfish, *Kryptopterus bicirrhos*, although without marked colour and almost transparent, this species shows a silvery covering (stratum argentum) to the internal organs.

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

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

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

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

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

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

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

Next month: Colour pigments and 'colour feeding'.
Quietening a Noisy Aerator

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

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

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

The remedy is simple! Purchase a new diaphragm—costing just a few pence—and fit it in place of the old one. However, be careful to note the order of rubber and metal washers sandwiching the old diaphragm when you disassemble it. Then gently remove the grime from the valve seats with a pointed matchstick—never use anything metal, which will damage the plastic. The top valve is usually easy to get to, the lower one is (in the pump shown) accessible from underneath after removing a rubber plug. Sometimes the whole valve block can be removed by loosening one central screw,
making routine servicing so much easier. Although valves are not subjected to the same abuse as the diaphragm, you might like to replace them, too, to make it a first-class job; but make sure you can get replacements before you remove the old ones, which are often glued in place. And remember to replace or clean the air filter if one is fitted, though all too often it is quite useless as unfiltered air can get in freely around the electric flex hole or between the pump body and base. With a little thought these problems could perhaps be cured by the hobbyist, or a filter fitted where none was before, to ensure maximum efficiency from the pump for lengthy periods.

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

(a) Put a clamp on the air line leading from the pump. Careful adjustment will often increase the back-pressure sufficiently to quieten the pump, without greatly reducing the total air output.

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

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

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

CLIFF HARRISON

Photographs by the author

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

Transatlantic Topics

By JIM KELLY

Fishing up his glass of beer, the American host shook it and indicated that there was nothing there for cultivating micro worms... Was I hearing things? Beer as a brew alone, I had heard of, but the only link between the drink and the hobby was surely for the consumption of the breeder, not the brewer. Visions of diaphonemic worms—masses pursued by alcoholic fry swam before my senses. ‘Seriously,’ he went on. ‘Next time you mix up a culture of micro worms mixing some beer with the crew—at last much longer than milk and is more beneficial than water... and the fish love ‘em this way. ‘I bet they do,’ was all I managed, ‘Will you have the same again?’

* * *

Most marine fishes have never been cheap in price in Britain, so it is only natural that those aquarists with a taste for salt in their tanks must copy their Florida cousins. When they want to stock an aquarium, citizens of the Sunshine State simply swim out to sea and catch them.

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

Around the many wharves and reeds is to be found the ‘chameleon’ sergeant major. He can change colour in an instant from a black-headed, yellow creature, to silver or all black. In the domestic set-up the S.M. needs plenty of elbow space, often marking out a particular territory as his own and chasing away any intruders, especially others of his kind.
The only thing that destroys my image of this idyllic haven for marine enthusiasts is the hole the Miami hotel accommodation left in my cheque book. Taking those expenses into account, fish aren’t so dear over here after all!

* * *

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

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

In the business of fish classification it would be a boon. Instead of ploughing through pages of references the researcher would simply obtain the requisite card, place it in the reader and the machine would automatically flash an enlargement of the required page on a screen. To keep it up-to-date all you have to do is to feed the machine with current information.

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

* * *

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

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

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

To emphasise the fact that many other aquarists consider these worms to be excellent food I quote Henry Kaufman, famous in America for his super guppies: ‘The difference between a guppy and a show fish champion is the use of tubifex worm in their diet.’

Now do you believe us?

* * *

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

For readers who dislike scientific names I suggest they consult Colin Roe’s A MANUAL OF AQUARIUM PLANTS, which both illustrates and describes each variety of these plants, I think that the similarity of the two is responsible for many aquatic stores innocently selling willow moss as suitable for the tropical aquarium. In most cases where this has happened the plant degenerates into a slimy mess. When willow moss does survive in tropical tanks it is usually in the form known as gracilis.

**Young Prizewinner**

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

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

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

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

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

By W. A. TOMEY
Photographs by the author

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

I don’t know why we are so keen on planting even the last bare patch of gravel in the tank, but just have the ‘feeling’, but yet one in which even the less-gifted aquarists can get pretty far, if they are only prepared to listen to their successful friends and to learn their lessons.

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

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

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

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

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

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

It is a remarkable thing these days that people have no time to spare, and in the hobby this results in many hobbyists choosing to have slow-
growing plants that require little maintenance. If you ask owners of ‘top aquaria’ how much time they devote to their tank a typical answer will be 3-4 hours per week, depending on tank size, but the time is given regularly, spread over the week. Just this regularity is the key of cultivation! To restore a run-away aquagarden, to bring it back to its original beauty, is difficult and costs much more time and effort.

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

**Middle groups:** Cryptocoryne petchii, a well-growing cryptocoryne, very variable in colour, reddish brown, bronze spotted etc, depending on place, soil, light, season etc. A plant with few demands, only the removal of too-long leaves in time and, especially with very dense growth, the removal of enough leaves for the plants to get ‘air’, otherwise they can be suffocated.

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

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

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

Behind the ‘ambulia’ there is another old-timer, *Ludwigia natans*, which is a fast grower, especially under strong light or with some daylight provided. It is not impossible that this *Ludwigia*,
with its red-green leaves, once having reached the surface of the water will take so much light away that the 'ambulia' will suffer. The experienced hobbyist foresees this event in time and takes steps to prevent this by 'topping' the ludwigia. In this way the water surface keeps open and light can reach 'ambulia' unobstructed. This requires a bit of insight, attention and trouble, but it is the price of a hobby!

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

**Picture 3.** In the centre of this photograph you see the large, very tender leaves of *Nymphaea lotus* var. *japonica*, a species of water lily imported from Japan. It has a beautiful reddish brown colour, giving a very contrasting effect in the surroundings of mainly green plants. A large specimen can be used as a solitary plant between groups of others. To obtain a plant of such size, with leaves of perhaps 3-4 in., the rhizome has to be placed where the plant can develop without hindrance from other plants.

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

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

**Picture 4.** This view shows a combination of long *Myriophyllum hippuroides* (rear), *Alternanthera reinecki* (middle) and *Miconanthemum micran-
themoides (front). Of these three species the reineckii requires least maintenance. In a healthy tank it grows steadily, but in no comparison to the really fast growers, and the plant can therefore be kept in one place for a pretty long time. However, in the long run this plant also will need to be cut and replanted.

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

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

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

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

What’s New?

Testing for Nitrites

NEW from Reliant Products (Basildon, Essex) distributed by C.J. Skilton Aquarist, Great Gable, Chase, Burt’s Green, Sandon, Chelmsford, CM2 7TR is the RELIANT NITRITE LEVEL TEST KIT. The kit contains a polythene bottle of indicator, a plastic phial and lid for holding the test sample of aquarium water and a ‘nitrite level’ coloration chart. Three drops of indicator in half the phial of aquarium water (either fresh or salt) will, the instructions explain, after one shake of the phial produce a coloration if nitrite is present (a shade of yellow) for comparison with the chart. The chart analysis of the test readings also gives suggestions on how to correct the reading if necessary. The makers claim for the indicator that it is non-carcinogenic, stable, and has more sensitivity giving a wider range of ‘nitrite level’ readings. Recommended price, £.50 + V.A.T.

L-Shaped Tank

AN out-of-the-ordinary aquarium design likely to be of particular interest to our North American readers is the L-shaped all-glass, polymeric-framed aquarium (O’Dell...
Manufacturing Inc., 1930 South
22nd Street, Saginaw, Michigan
U.S.A. A specially designed
32 in. high wrought-iron stand, also
L-shaped, has been designed to
hold this tank, which would obvi-
ously be useful in a corner position.
The tank has a one-piece top and
double-sealed, ground rounded
bottom polymeric framing that, the
manufacturer’s state, offers high
dimensional strength and stability
and is completely corrosion-resistant,
for use with salt or fresh water.
Other features incorporated into
this L-shaped tank are a floating
bottom, hidden water line, and
already doubt that the majority of new marinists will
follow the convention of opening their innings
with fish rather than chemicals. This is quite
understandable as the whole object of the exercise
is to keep fish, it is human to be impatient, and
fish look better than dissolved chemicals. It should
be noted that in many cases the seasoning process
can be telescoped from several weeks to several
days by introducing sand or gravel from a seasoned
source, but the actual period required for nitrates
to reach the safety concentration for the more
delicate species must depend on purely local factors.
Selection of the right type of starter fish need
not be the haphazard sort of affair it often is. All
too often beginners buy as many different and
highly coloured damsels and clowns as they can
afford and they so strain the finely balanced new
system by overcrowding that the fish succumb
individually or, worse still, collectively, to one
ailment or another, and there is little left to show
for one’s efforts. It may be the case that, despite
the reputation of a particular species for hardiness
under seasoning conditions, this cannot be relied
upon universally, and it sometimes happens that
you will discover that you have a ‘black spot’ for
a species which it will be difficult in practice to
overcome.

Exactly what factor of your local environment
might be lacking is anybody’s guess at this stage
of the art, and you will find it helpful to exchange
notes with others nearby, as water factors could
well account for a lot. For example, I have always
failed with dominos, which are supposed to do
splendidly under all conditions. My own prefer-
ance is for the yellow-tailed blue damselfish, the
damselfish and the cloudy damselfish, though the
Dascyllus
run them very close, especially D. aruanus.
The important thing in introducing starter
fish is to keep them alive, to get them feeding, and
to keep them feeding, as it is their excreta which
contribute towards the establishment and mainten-
ance of the colonies of micro-organisms in the
gravels on the floor of the tank, on which the success
of the entire filtration system depends. This
being so it is obviously wasteful to use more than,
say, three 2 in. fish in a 30 gallons tank during
its early days. One has to be patient once the
initial group of pioneers has taken up residence.
They should be left to settle down and to do their
work without undue strains, and if they appear to
set about their business normally, and to take
food, leave them alone. Feeding should be restric-
ted to clean live food, which is unlikely readily
to cause pollution even if rejected by the fish.
For this reason brine shrimps are ideal, particu-
larly as they often induce a difficult starter to
begin feeding. White worms are a good alternative
as they remain alive in salt water for much longer
than is commonly believed to be the case—often
up to 24 hours after introduction.

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

Not Often Seen
Can you tell me something about Cichlasoma carinatum? Is it a rare cichlid? There seems to be very little information about it available.

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

Constant Level Siphon
I want to arrange a ‘constant level siphon’ on a 48 in. tank that I intend to keep with slowly flowing water. Could I use the device shown in the diagram on p. 557 of the March issue of 1972 and if so do you know where this could be purchased?

The ‘constant level’ siphon shown in the diagram you mention is made up from straight tubing and elbows and would be quite suitable for your purpose. If the inflow to the tank is not great, the versatile system of tubes (1 cm.), joints and elbows sold as a set in the Nuova range could be used to make up the device. Obviously any outflow system must have piping of large enough diameter to cope with the rate of inflow or else the constant level will not be attained. The bottom of the overflow pipe inside the tank should be attached to the stem of a funnel with its opening covered with a grid of some kind, particularly if there are plants in the tank that could become detached and block the siphon.

‘Cockatoo’ Dwarfs
Can you please tell me if there are any special requirements that I should supply for Apistogramma ramsayi or A. aqua si?

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

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

The beginner fishkeeper, picking out the fishes for his first community tank, can seldom resist the sight of one or two angel fish, the size of top pieces, in the dealer’s tanks. It has been said that it is unkind of the dealer to allow the unsuspecting novice to choose this fish. In a 24 in. tank they are going to outpace any other fish in the community in growth and they are very likely to ‘fight’. There is no easy answer. Keep them in a large tank with plenty of plants where each can have its own territory or separate them. Best of all, the dealer who sold them to you may be prepared to buy them back and replace them with fishes that will not outgrow the tank.

Lighting Difficulties
What is the best lighting with fluorescent tubes for a 48 in. by 12 in. by 12 in. community tank? At present I use two 3 ft. fluorescent warm white tubes left on for about 10 hours daily, but although the water rapidly turns green, plants such as Vallisneria just fades away (although Amazon sword shows a little growth).

Unusually, the problem of the poor growth of the Vallisneria would seem to be that it is receiving too much light. It is extremely difficult to give a ruling about the amount of light required in any tank, but a reasonable guide to follow is that given in the Practical Aquarist’s Diary: Watts = 32 x length of tank (inches) x illumination time (hours)

This is for tungsten lighting; the wattage required for fluorescent lighting is arrived at by dividing the value obtained from the above formula by 4. Substituting the details you have given, 153 watts of tungsten or 38 watts fluorescent are required for 10 hours of illumination. But the wattage of a 36 in. fluorescent tube is 36 so the tank is receiving 60 watts. Working the formula backwards, if the 36 in. tubes are to be retained, then more than 6-7 hours of illumination need be given. With a tank 48 in. long, however, a much better result would probably be achieved if an 18 in. fluorescent tube were to be substituted for one of the 36 in. lengths and then both tubes kept on for 8-9 hours a day.

The continual greening of the water would indicate excessive lighting (and probably some overfeeding!), and the fact that the
Aqua GLOSSARY

No. 12

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

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

Brama (Old French): bream. Pronounced 'brah-mah'. The scientific name of the bream Abramis brama ('ah-rah-miss brah-mah') is in fact owes its generic name to a Nile fish known to the Greeks as abramis (no connection with the root brama used for the trivial name of the bream). The headstartler (Abramis microcephalus; 'abra-me-tree snick-toe-kuff-al-us') represents another fish where the genus name is based on the old Greek name, and abramis means 'little abramis', but with no relationship at all to the bream.

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

Pond Liner

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

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

Dolicho (Greek): long. Pronounced 'doll-ick-oh'. In the blue chin catfish Xenopa dolichoptera ('zen-no-kar-ah doll-ick-oh-ter-ah') the specific name means literally long fin (pter, Greek; wing, fin).

Versicolor (Latin): variegated, changing colour. Pronounced 'ver-see-color'. For example, Limia versicolor ('lim-mee-ah ver-see-col-oh').
FBAS Basic Show Class Letters: A, furnished aquaria and aquascape; B, Barb; C, characin; D, cichlid; E, labyrinth; F, egglaying toothcups; G, tropical catfish; H, Corydoras and Brocchis; J, rasbora; K, danio and W.C.M.M.; L, loach; M, a.o.s. tropical egglayers; N, pairs of fish; O, guppy male; P, guppy female; Q, swordtail; R, platy; S, mollie; T, a.o.s. livebearer; U, single-tailed goldfish; V, twintailed goldfish; W, a.o.s. coldwater; X, breeders' classes; Y, marine fish; Z, plants.

SHOW Secretary of HENDON & BORESMOUTH AS, Mr R. S. Thompson, reports, 'Over the past few months, the Hendon & Boresmouth AS have been marketing in a series of successful and light-hearted challenge matches or social gatherings with other societies. On 15th April the AS held a return match with old friends—Uxbridge. The table saw showed Hendon convincingly beaten by an Uxbridge team with strength in depth, Uxbridge scoring 91 points, Hendon 87.5. (1, Mr R. D. Ricketts, Uxbridge, 81; 2, Mr P. G. Ginger, Uxbridge, 80; 3, Mr R. S. Thompson, Hendon, 79). The quiz resulted in what might have been a dead heat, but dubious scoring and decisions by quizmaster Mr K. Purbrick made any decision unrealistic. A future warning for other clubs—Quizzes are not a veldo but the scientific name for dry rot! 17th May and the turn of Sudbury and East London A & P. Again some dubious adjudicating saw Hendon in their true position—last behind Sudbury and East London. No amount of fiddling could alter the results in the table saw however—Hendon 88.64; Sudbury 86.8; East London 86.1. Mr H. Watts, Hendon, 79; 2, Mr J. Smith, Sudbury, 78; 3, Mr R. Thompson, Hendon, 77. Hendon would like to thank everyone for their support and in particular Mr D. Lambourn and Mrs P. Baynton, the two judges.'

FOURTEEN FBAS-affiliated societies took part in the annual inter-club show organised by PEMAST AS on Spring Bank Holiday Sunday, and final placings were: Roehampton (22) winners of shield; Basingstoke (20); Portsmouth (15); Sudbury (14); Havant (11); Gosport (8); Kingston (7); Newbury (7); Southampton (5); Reading (4); Freelance (3); Brighton (3): Littlehampton (1) and New Forest (1). While the fish were being judged by FBAS judges Mr R. D. Esson, Mr P. Ginger and Mr I. Mathieson, the programme of films was shown, including the extremely interesting BBC Horizon 'Making a Natural History Film'. The Society look forward to welcoming many of their previous guests to their last 21st Open Show at the new venue of St Patrick's Hall, Winter Rd, Southsea, Portsmouth, 4th & 5th August. Schedules are available from the show secretaries: Mr J. Stillwell, 34 Salcombe Avenue, Coppins, Portsmouth, PO9 6LD.

NEW Secretary of the GOLDFISH SOCIETY OF GREAT BRITAIN is Mrs M. Daley, 163 South Park Road, Wimborne, London, SW19 8RX (phone: 01-410-4656).

JUDGES Mr I. Woods, Mr B. Peneggy and Mr H. Cooper had 409 entries to consider at the NORTHICH & DAN AND'S 55th Open Show. Major prize-winners were: Thorpe trophy, Best Fish in Show, B. & B. Booker (Morlom Bay); Russel Allan trophy, Best Livebearer, B. & C. White (Leigh); Best Breeder's trophy, best breeders' Exhibits, Mr & Mrs A. Thomas (Independent); Hyland trophy, Best Catfish, botzias, loach, Mrs D. T. Armour (Ellesmere Port); Harry Buckley trophy, best coldwater, L. & D. Thorne (Northwich); Interpret trophy, Society gaining most points, Northwich; King British trophy, Northwich member gaining most points, L. & D. Thorne. Remainder of results:

Guppy: 1, Mr B. Darby (Hyde, 75); 2, Mr P. Hall (Bunranna, 70); 3, C. & R. Darby (Northwich, 68). Swordtail: 1, Mr P. Walker (Northwich, 70); 2, Mr B. Darby (Hyde, 50); 3, Mr B. Knowles (Northwich, 52). mollie: 1, Mr R. R. Miall (Middlesbrough, 74); 2, Mr R. W. Carter (Chester, 76); 3, Mr R. Allerton (Gowerton, 59). Platy: 1, R. & C. White (Leigh, 73); 2, Mr W. D. Haddow (Hyde, 73); 3, Mr R. Knowles (Chester, 56). Small barbels: 1, Mr K. Wright (Sandysound, 72); 2, Mr R. W. Carter (Maidstone, 72); 3, Mr R. E. Payne (Sherwood, 72). Small catfish: 1, L. & D. Thorne (Chester, 76); 2, Mr R. W. Carter (Maidstone, 74); 3, Mr B. Summer (Sandysound, 74). Large catfish: 1, R. & B. Ficker (Morlom Bay, 86); 2, Mr B. Walker (Chester, 78 & 79). Fishermen: 1, Mr L. R. Price (Leigh, 73 & 76); 2, Mr R. Weston (Mersey, 60). Small aquariums: 1, Miss L. Gullane (Buxton, 73); 2, Mr A. Taylor (Mortlake, 73); 3, Mr J. Stadl, 60. Aquariums: 1, Mr P. S. Godden (Darlington, 74); 2, Mr G. Bull (Chester, 73); 3, Mr G. Bull (Chester, 73). Dwarf cichlids: 1, Mr W. D. Haddow (Chester, 79); 2, Miss J. Gullane (Chester, 79); 3, L. & D. Thorne (Chester). Cichlids: 1, Mr J. Stadl, 70; 2, Mr H. E. Goff (Chester, 79); 3, Mr J. Gullane (Chester, 79); 2, Mr G. Wilkinson (Chester, 79).

Dinos and minnows: 1, Mr P. Floyd (Northwich, 79); 2, Mr J. Licence (Chester, 79); 3, R. & B. Booker (Chester). Sharks: 1, Mr R. Harlow (Chester, 79); 2, Mrs D. T. Armur (Ellesmere Port, 78); 3, Mr R. Allerton (Gowerton, 79). Toothbears: 1, & 2, Mr T. Sinclair (Chester, 79); 3, R. & B. Booker (Chester). Fairy loaches: 1, Mr R. Allerton (Gowerton, 79); 2, Mr R. W. Carter (Chester, 76); 3, Mr R. E. Payne (Sherwood, 72). Fairy catfish: 1, R. & C. White (Leigh, 73); 2, Mr W. D. Haddow (Hyde, 73); 3, Mr R. Knowles (Chester, 56). Fairy guppies: 1, R. & C. White (Leigh, 73); 2, Mr W. D. Haddow (Hyde, 73); 3, Mr R. Knowles (Chester, 56). Fairy loaches: 1, Mr R. W. Carter (Chester, 76); 2, Mr R. E. Payne (Sherwood, 72). Fairy catfish: 1, R. & C. White (Leigh, 73); 2, Mr W. D. Haddow (Hyde, 73); 3, Mr R. Knowles (Chester, 56). Fairy guppies: 1, R. & C. White (Leigh, 73); 2, Mr W. D. Haddow (Hyde, 73); 3, Mr R. Knowles (Chester, 56).

MR DIXON, P.R.O. of REIGATE & REDHILL AS, reports on recent club activities: 'In April, Reigate & Redhill AS received a return visit from the Nomads of Caterham for an informal show. The Nomads were—labyniths, a.o.v livebearers, Corydoras and Brocchis and characins, and Nomads achieved a clear win over the home team. Unfortunately the intended programme of activities fell through, but both clubs had an enjoyable evening and got to know each other better over an abundant refreshments. At the following meeting, Mr I. Dixon and Mr S. Perman, also "Woodland Productions", provided a preview of their newly made slide and tape lecture 'Let's chat about Furnished Aquaria'. This was followed up at a later date by attempts from members to set up small furnished aquaria under the eye of our expert Mr B. Leach. Unfortunately there appeared to be something of a plant shortage, and the contents of some of the tanks were novel, aquatic wise, to say the least. It looks as if the...
Society could do with a bit of study  
on plant growing too! The latest  
meeting at the Anglian Inter-lub,  
with a comparatively new  
club, Haslemere, who arrived liter-  
ally by the coach load. Whilst  
out of town, Mr G. Park  
talked about the chemistry of water,  
and the two Societies had some  
interesting comparisons drawn on  
their differing water supplies. Show  
dishes were dwarf cichlids, neq  
carp, Corydoras & Brochis, and  
barbs. This time Reigate came out  
on top!'

A SPECIAL meeting for members  
and clubs of the BRITISH AQUARIISTS  
STUDY SOCIETY was held on  
Saturday, 26th June at the Breakers  
& Bar, Turners Hill, East Grinstead.  
Mr G. Park talked about the chemistry  
of water, and the two Societies had some  
interesting comparisons drawn on  
their differing water supplies. Show  
dishes were dwarf cichlids, neq  
carp, Corydoras & Brochis, and  
barbs. This time Reigate came out  
on top!

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

**Championship Class Show Results**

<table>
<thead>
<tr>
<th>Place</th>
<th>Name</th>
<th>Fish</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Croydon</td>
<td>Cb</td>
<td>Mr L. J. Brazier (Sudbury)</td>
</tr>
<tr>
<td>2nd</td>
<td>Riverside</td>
<td>Da</td>
<td>Mr John Batts (Ealing)</td>
</tr>
<tr>
<td>3rd</td>
<td>Corby</td>
<td>Db</td>
<td>Mr W. Wickham (Dudley)</td>
</tr>
<tr>
<td>4th</td>
<td>Southend, Leigh</td>
<td>Dc</td>
<td>Mr D. M. Dare (Independent)</td>
</tr>
<tr>
<td>5th</td>
<td>Vauxhall Motors</td>
<td>Ea</td>
<td>Mr A. Taylor (Sudbury)</td>
</tr>
<tr>
<td>6th</td>
<td>Half Moon</td>
<td>Eb</td>
<td>Mr R. B. Dunsdon (Stockton)</td>
</tr>
<tr>
<td>7th</td>
<td>Roehampton</td>
<td>Ee</td>
<td>Mr D. Lambourne (Roehampton)</td>
</tr>
<tr>
<td>8th</td>
<td>Independent</td>
<td>Eg</td>
<td>Mr D. R. Wright (Ealing)</td>
</tr>
<tr>
<td>9th</td>
<td>Port Talbot</td>
<td>Eh</td>
<td>Mr E. Earnshaw (Taunton)</td>
</tr>
<tr>
<td>10th</td>
<td>Medway</td>
<td>Eh</td>
<td>Mr J. Parker (N. Kent)</td>
</tr>
<tr>
<td>11th</td>
<td>Havant</td>
<td>Em</td>
<td>Mr R. Tiley (Basingstoke)</td>
</tr>
<tr>
<td>12th</td>
<td>Lantwit Major</td>
<td>En</td>
<td>Mr &amp; Mrs W. P. Johnson</td>
</tr>
<tr>
<td>13th</td>
<td>Uxbridge</td>
<td>Ec</td>
<td>Mr R. Newman (Uxbridge)</td>
</tr>
<tr>
<td>14th</td>
<td>Yeovil</td>
<td>Ec</td>
<td>Mr D. S. Langdon (Yeovil)</td>
</tr>
</tbody>
</table>

**Forthcoming Championship Class Shows**

- 4th-11th August: Portsmouth AS
- 5th August: Tonbridge AS
- 30th August: Northampton AS
- 2nd September: Bethnal Green AS
- 8th September: Reading-Didcot-Boxcane
- 9th September: Harlow AS
- 9th September: Newbury AS
- 13th September: Hounslow & Das
- 23rd September: Torbay AS
- 23rd September: North Kent AS
- 6th October: E. London A & PA
- 7th October: Ealing AS
- 28th October: Newcastle Guppy & L/BS

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

The first three lectures are now available and are: ‘“Non U” Goldfish’ by  
Ginger. Running times are approximately 45-60 minutes with a built-in  
interval for the traditional refreshments session. The programmes come  
complete with slides, tape and full instructions. The hiring fee is £2.00 to  
Federation-affiliated societies—rates to other societies available upon  
application. Bookings will be dealt with in strict rotation, and societies are  
especially asked to co-operate by the prompt return of programmes—there is  
probably another society waiting. A second choice of subject and date  
would be appreciated when booking is made.

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

The availability of new titles will be announced shortly and will include  
NEWS from HASTINGS & ST LEONARDS AS illustrates the varied and interesting activities members of a thriving club enjoy. Recent lectures on the club’s meeting nights at the Conservative Offices, Cornwallis Gardens, have included one by Mr. G. Pyke on beginning an aquarium that covered both the very latest tanks and the first types of all with slate bottoms and heating by Burco burners. Mr. G. Pyke lectured on fishes he had bred, and an interesting lecture by Dr. W. D. Stephen, who described his recent Far Eastern tour and developments in the hobby there, 23 members journeyed to Bexhill for an inter-club show with Tonbridge and Bexhill societies (which Tonbridge won with 19 points) and heard a talk by Mr. J. Burles of Mid-Sussex AS on native marine. Club member Mr. P. Stapley was very successful at the Littlehampton & Bognor AS Open Show, achieving a first for rainbow, second for cichlids and third for breeders team.

The Society has recently been delighted to meet two committee members from Hamilton & DAS, perhaps Mr. J. Andrews and Mr. D. MacPherson were able to accompany the club on their trip to Bexhill for the inter-club competition there to meet members of all three societies and exchange views and news.

560 ENTRIES were bunched from 21 different societies at the SOUTHEAST, LEIGH & DAS Open Show. Trophies were presented by the Pearly Queen of Farnborough as follows: Best Neotropical, trophy, Mr. J. Murphy; Best Junior exhibitor, T. Hodge; Club Championship trophy, Throckmorton AS; Best Coldwater Fish exhibition, Mr. R. Parker; Best Whitecloud, Mr. D. C. M. Storr; Best Breeder trophy, Mr. T. Wooley; Best In-show trophy, Mr. J. Thorne. Detailed results were:

A, 1, S. W. (SLADAS); 2, M. C. (SLADAS); 3, Mr. B. J. Booth; 4, Mr. K. A. Milward (Throcks); 5, Mr. E. T. Wall (Throcks); 6, Mr. G. D. Barker (Sladex); 7, Mr. W. A. Milward (Sladex); 8, Mr. E. T. Wall (Throcks); 9, Mrs. J. H. Barker (Sladex); 10, Mr. K. A. Milward (Throcks); 11, Mr. J. H. Barker (Sladex); 12, Mr. E. T. Wall (Throcks); 13, Mr. G. D. Barker (Sladex); 14, Mr. W. A. Milward (Sladex); 15, Mr. E. T. Wall (Throcks); 16, Mr. G. D. Barker (Sladex); 17, Mr. W. A. Milward (Sladex);

B, 1, M. C. (SLADAS); 2, S. W. (SLADAS); 3, Mr. B. J. Booth; 4, Mr. K. A. Milward (Throcks); 5, Mr. E. T. Wall (Throcks); 6, Mr. G. D. Barker (Sladex); 7, Mr. W. A. Milward (Sladex); 8, Mr. E. T. Wall (Throcks); 9, Mr. G. D. Barker (Sladex); 10, Mr. W. A. Milward (Sladex); 11, Mr. E. T. Wall (Throcks); 12, Mr. G. D. Barker (Sladex); 13, Mr. W. A. Milward (Sladex); 14, Mr. E. T. Wall (Throcks); 15, Mr. G. D. Barker (Sladex); 16, Mr. W. A. Milward (Sladex); 17, Mr. E. T. Wall (Throcks).

AUCTIONEER’s committee member Mr. K. Upton had plenty to auction at the BEDWORTH A & PS, but there was a new and big sale: To encourage more members to show fish in the show, there was an Open Show divided into two sections, A and B, with a Class B, and both with a Class A, with each Class A having more than three entries as impressive. Results were:


BEDWORTH AQUARIUM & POOL SOCIETY would like to exchange copies of newsletters with other societies at home and abroad. Interested club secretaries please contact: chairman Mr. J. S. Salisbury at 5 Caldecott Court, Foleshill, Coventry.

MID-SUSSEX AS report: ‘Mid-Sussex’ AS pride themselves on being forward-thinking and full of bright ideas. For some years now they have held an annual Fish Exhibition in which members display their hobby to the general public on a non-competitive basis. Chairman of the society, Mr. R. Johnson, maintains that this event does more to encourage interest in the hobby than all the Open Shows put together. An exalted claim, but thinking that there is more than a grain of truth in it. This year nearly 2,500 members of the public visited the Park Centre, Burgess Hill on Sunday 23rd May to see a wide range of aquarium displays. Support for this venture was so encouraging that the Exhibition Manager, Mr. S. Soper, looks forward to a 2-day exhibition next year. He says the ‘hall is already booked for Bank Holiday Sunday and Monday—all we have to do now is put on a bigger and better display, if that’s possible. The main item on this year’s exhibition was, of course, the introduction of the world’s first Crab Derby which attracted a great deal of attention from not only the local but also the national press. Perhaps the major publicity was when the crabs appeared on Channel 4’s Blue Peter; this preview event was won by Puddle Joker, a century old, and the 1960 run was featured on the Blues Peter team. In the main event of the day the tables were turned when Sidewalk won the first ever World Championship in Crab racing. The race was on over 1,000 units of crustaceans and is open to anyone bringing their own crabs.’

BEST fish in show at the BISHOPS CLEAVE AS Open Show was a Synodontis sp. entered by Mr. J. S. Salisbury of Bedworth AS. 319 fish were entered, and detailed results were:

Class 1: 1, Mr. G. V. Ludlow; 2, Mr. A. Jones; 3, Miss F. Green;
THE BRITISH KILLIFISH ASSOCIATION feel it may be helpful to club secretaries to know that the Association have the following Tape and Slide Shows available: 1. Top and Sixth Spanners; 2. Pest Diver; 3. Salt Spanner; 4. Ritusus species; 5. Killifish Egg Development; 6. Fish Farm Construction; 7. Trip to Ghana. These are available from: Services Secretary B.K.A., Mr. F. Boden, Highchurch, 12 Hill Street, Upper Gormal, Dudley, Worcestershire D.V.3. All correspondence regarding the above should be addressed to him; an a.s.a. would be appreciated.

H & DAS Barb Cup: Mr. J. Pollard (Kingston); H & DAS Charr Cup: Mr. K. Taylor (Havant); H & DAS Catfish Cup: Mr. R. M. Adams (Portsmouth); Mr. G. Prat (Havant); H & DAS Catfish Cup: Mr. K. Groves (Mid-Sussex). Kent Trophy Cup for best Rift Valley cichlid: Mr. L. Little (Bucknell), Peter Sparham Cup for best pair of fish: Mr. P. Watt (Havant), Norman Fisher Cup for best damselfish or WCMY; S. H. Farrish (Hounslow), H & M Cup for best labyrinth: Mr. S. Crawford (Havant). John Taylor Cup for best group. Overall results as follows:

A: 1st Mrs. D. Boles (Havant), 2nd Mrs. J. Vinson (Southampton), 3rd Mr. A. Marshall (Bunrading), 4th Mr. L. Little (Bucknell), 5th Mr. R. M. Adams (Portsmouth), 6th Mr. G. Prat (Havant), 7th Mr. B. Waters (Southampton), 8th Mr. R. Taylor, 9th Mr. J. Dickman, 10th Mr. J. Hughes (Bucknell), 11th Mr. R. Taylor, 12th Mr. J. Pollard, 13th Mr. J. Hughes, 14th Mr. R. Taylor, 15th Mr. A. Marshall (Bunrading), 16th Mr. R. Taylor, 17th Mr. J. Pollard, 18th Mr. R. Taylor, 19th Mr. A. Marshall (Bunrading), 20th Mr. R. Taylor, 21st Mr. J. Pollard, 22nd Mr. R. Taylor, 23rd Mr. A. Marshall (Bunrading), 24th Mr. R. Taylor, 25th Mr. J. Pollard, 26th Mr. R. Taylor, 27th Mr. A. Marshall (Bunrading), 28th Mr. R. Taylor, 29th Mr. J. Pollard, 30th Mr. R. Taylor.

HAVANT & DAS held its 3rd open show in the new old shop opposite the station. The exhibition was very strong and the judging took place on the 23rd of April. The winners were: Mr. R. Adams (Southbury), Dittman & Malpas Cup for best livebearer and H & DAS Cup for best coldwater fish; Mr. F. Willis (Portsmouth), John Taylor Cup for best breeder and Janet Birdfield Cup for best dwarf cichlid; Mr. E. Martin (Portsmouth), John Taylor Cup for best surfish and Vernon Hunt Cup for best twintailed goldfish; Mrs. J. Vincent (Southampton), H & DAS Barb Cup: Mr. J. Pollard (Kingston), H & DAS Charr Cup: Mr. K. Taylor (Havant), H & DAS Catfish Cup: Mr. R. M. Adams (Portsmouth), Mr. G. Prat (Havant), H & DAS Catfish Cup: Mr. K. Groves (Mid-Sussex). Kent Trophy Cup for best Rift Valley cichlid: Mr. L. Little (Bucknell), Peter Sparham Cup for best pair of fish: Mr. P. Watt (Havant), Norman Fisher Cup for best damselfish or WCMY; S. H. Farrish (Hounslow), H & M Cup for best labyrinth: Mr. S. Crawford (Havant). John Taylor Cup for best group. Overall results as follows:

A: 1st Mrs. D. Boles (Havant), 2nd Mrs. J. Vinson (Southampton), 3rd Mr. A. Marshall (Bunrading), 4th Mr. L. Little (Bucknell), 5th Mr. R. M. Adams (Portsmouth), 6th Mr. G. Prat (Havant), 7th Mr. B. Waters (Southampton), 8th Mr. R. Taylor, 9th Mr. J. Dickman, 10th Mr. J. Hughes (Bucknell), 11th Mr. R. Taylor, 12th Mr. J. Pollard, 13th Mr. J. Hughes, 14th Mr. R. Taylor, 15th Mr. A. Marshall (Bunrading), 16th Mr. R. Taylor, 17th Mr. J. Pollard, 18th Mr. R. Taylor, 19th Mr. A. Marshall (Bunrading), 20th Mr. R. Taylor, 21st Mr. J. Pollard, 22nd Mr. R. Taylor, 23rd Mr. A. Marshall (Bunrading), 24th Mr. R. Taylor, 25th Mr. J. Pollard, 26th Mr. R. Taylor, 27th Mr. A. Marshall (Bunrading), 28th Mr. R. Taylor, 29th Mr. J. Pollard, 30th Mr. R. Taylor.
In Brief...

At their June meeting Dorchester & Dales held a talk on 'Classes of Fish' by Mr A. Werth, followed by a talk on 'Fishing for Show' by Mr M. C. Brailsford. Both classes in the month's table show were won by Mr R. C. Christophers with an angel fish and a Plecostomus.

A large gathering of New Forest members at the Community Centre, Seepington, Harris discussed ways to increase Society membership and to generate more entries to the Gainsborough AS and most members admitted that they had learned a lot of new tricks to deal with this task. Winners of the monthly table show were: Large Characins, Mr & Mrs W. D. Gilling - small characins, Mr R. Varnay; Minnows and Danio, Mr & Mrs R. Harris; Master G. Gilling won all three classes in the junior section.

The Soper (Mid-Sussex AS) held a very successful talk on-breeding some of the more difficult fish in association with Brighton & Southern AS and set up a breeding tank for the junior members. Mr R. King won the table show classes for both Danio and minnows and babybowl judge, Mr C. West, Mid-Sussex AS.

The regular monthly meeting of Newbury & District was enlivened by an amusing but non-informative talk by Mr D. Jenkins of Broadwood. His advice on how to keep marauding gangs of cats away from fish ponds largely consisted of spreading a liberal supply of half bricks, and his comments on his neighbours' efforts to find out how the fisherman had his audience 'in stitches'.

A superb evening was the verdict on the interesting and informative quiz presented by Mr R. J. Pearson to members of Suffole A & PA.

Southend, Leigh & District held the second leg of the inter-club competition between Kent. Southend, Thurrock and Essex societies. Progressive totals (two legs...
MEMBERS of WEYMOUTH AS were given a helpful demonstration on how to keep a tank with maximum safety by Mr. B. Cornick of Dorchester in a talk on 'Safe Electrics'. Mr. G. Fitzgerald won the table show in the aquarium class and Mrs. P. Carter that for H.H. & C.

THE FIFTH ANNUAL EAST OF SCOTLAND CLUBS & SOCIETIES' SHOW was to be held in Aberdeen on Sunday, 26th August. The venue is the Music Hall, Union Street—a central and easily accessible point. Entries (25 classes) accepted from 11.00 a.m. to 1.30 p.m. Classes include breeders' tanks and Rift Valley cichlids (only members of East of Scotland Aquarium clubs or societies will be eligible to enter fish). Full details, schedules, entry forms, maps of Aberdeen, etc., are obtainable from Mr. G. Ross, 1 Gairnshiel Place, Aberdeen (phone Aberdeen 493946) or through the secretary of any East of Scotland club or society.

FIRST event on DERBY REGENT AS new calendar was at the Derby County Show where a successful exhibition of tropical fish was held. A highlight of the exhibition was a country cottage setting with plants and shrubs and a large pond filled with goldfish in front, with, as a final touch, a fountain in the centre.

TORBAY AS members have been doing well at open shows this season, notably at the Ilfracombe, Yeovil and Weymouth shows. Mr. J. Davis was judged to have the best coldwater fish at Ilfracombe. At the inter-club competition at Totnes, Torbay was represented with 21 points (1, Plymouth, 23; 2, Exeter, 94).

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

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

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

Dates for Your Diary

4th-11th August. PORTSMOUTH AS Open Show. St. Patrick's Hall, Winter Road, Southsea, Portsmouth. Setting up Saturday, 4th August; judging, 5th; open to the public, Monday, 6th to Saturday, 11th. Schedules: Mr. J. Stillwell, 34, Salcombe Avenue, Copnor, Portsmouth, Hants. PO5 6LD.

8th August. TONBRIDGE & DAS Open Show, Tonbridge School, Tonbridge, Kent. Schedules: Mr. I. T. Matheson, 33, Noremore Way, Five-Oak Green, Tonbridge, Kent.


11th August. NORTH STAFFS AS Open Show. The Newsham Castle Hotel, Waterfall Road, Coalbridge, Stoke-on-Trent. FNAS Rules. Details: Mr. K. Ankers, 4 Castle

Street, Chesterton, phone 739.54666, or Mr. J. B. Booth, 55 Beverley Drive, Bentleye, Stoke-on-Trent, Staffs.

11th-18th August. MIDLAND OPEN SHOW (MAPS). Bingley Hall, Broad Street, Birmingham, Details: Mr. T. G. Green, 46 Berrood Street, Winton Green, Birmingham, 18; phone 021-554 9064.

18th-19th August. HARWICH & DAS Open Show. The Queen's Hotel, Dovercourt, High Street, Harwich. Details: Mr. A. Green, 31 The Ridgeway, Dovercourt, Essex, COR1 4UJ.

19th August. BEDWORTH AS & PS Open Show. Nicholas Chamberlain School, Bullyingdon Lane, Bedworth. Details: Mr. J. Hudock, 7 Tamar Road, Bullyingdon, Warks.


20th August. NORTH STAFFS AS Open Show. The Newmarket Castle Hotel, Waterfall Road, Coalbridge, Stoke-on-Trent. FNAS Rules. Details: Mr. K. Ankers, 4 Castle

Street, Chesterton, phone 739.54666, or Mr. J. B. Booth, 55 Beverley Drive, Bentleye, Stoke-on-Trent, Staffs.

11th-18th August. MIDLAND OPEN SHOW (MAPS). Bingley Hall, Broad Street, Birmingham, Details: Mr. T. G. Green, 46 Berrood Street, Winton Green, Birmingham, 18; phone 021-554 9064.

18th-19th August. HARWICH & DAS Open Show. The Queen's Hotel, Dovercourt, High Street, Harwich. Details: Mr. A. Green, 31 The Ridgeway, Dovercourt, Essex, COR1 4UJ.

19th August. BEDWORTH AS & PS Open Show. Nicholas Chamberlain School, Bullyingdon Lane, Bedworth. Details: Mr. J. Hudock, 7 Tamar Road, Bullyingdon, Warks.

26th August, HUDDERSFIELD TPI Open Show. Paddock Owen Youth Club, Beech Street, Paddock, Huddersfield.

26th August, GREAT YARMOUTH TPI Open Show, Rossall Park, North Denes, Great Yarmouth. Details: Mr. P. G. Watson, Gt. Rossall Road, Great Yarmouth.

25th August, EAST OF SCOTLAND AQUARIST CLUBS & SOCIETIES Annual Open Show. Bridge Hall, Union Street, Aberdeen. Details: Mr. A. G. Wood, 3 Union Street, Aberdeen.

24th August, FLEETWOOD AS Open Show, Bridge Hall, Fleetwood, Lancashire. Details: Mr. H. W. Jones, 9 The Avenue, Fleetwood.

24th September, HUDDERSFIELD TPI Open Show. Paddock Owen Youth Club, Beech Street, Paddock, Huddersfield.

24th September, WESTON-SUPER-MARE & TFC Open Show, St James Hall, Orchard Street, Weston-super-Mare. Details: Mr. J. Clarke, St James, North Street, Cheddar.

24th September, GOSLO Open Show, The Pavilions Gardens, Bath, Bristol. Details: Mr. E. A. Spiller, 11 Lower South Road, St Leonard's-on-Sea, TN37 6Dl.

24th September, BUXTON & DAS Open Show. The Pavilion Gardens, Buxton. Details: Mr. W. E. Thomas, 8 Millers Lane, Buxton.

24th September, RHONDDA AS Open Show. Central Hall, Taffs Well, Rhondda. Details: Mr. M. Williams, 137 Top Taffs Well, Rhondda, Glam. Excellent cattle showing.

24th September, GOSLO 25th Anniversary Show. The Pavilion Gardens, Buxton.

24th September, TORAY AS Open Show, Torquay Youth Hall, Torquay. Details: Mr. J. R. Evans, 44 Friars Avenue, Talaton, Devon.

24th September, NEWBURY & DAS Open Show. Friars Market Place, Newbury. Details: Mr. G. Foster, 26 Julian Road, Newbury, Berks.

24th September, NUNEATON AS Open Show.

24th September, WALES & DAS Open Show, Owston Club, Owston,不对.

25th September, BRISTOL ANGLERS SOCIETY Open Show. Details: Mr. E. N. Badger, 14 Boness Road, Knowle, Bristol, BS3 1ES.

AMENDED show date for STONE AS: Their Open Show will be held on 23nd September, not 15th September as stated earlier. Schedules from Mr. K. W. Evans, 43 Friars Avenue, Walton, Stone.

London's Sixth Annual Exhibition of Fishkeeping

The AQUARIUM SHOW '73

Presented by the Federation of British Aquatic Societies
Friday 2nd November to Sunday 4th November at the Royal Horticultural Society's Old Hall, London S.W.1

Sponsored by PETFISH MONTHLY

Enquiries to: Show Organiser, PFM, 554 Garratt Lane, London SW17 0NY Phone 01-947 2005

HUCKNALL & BULWELL AS will now be holding their Annual Open Show on 23rd September and not 25th September as advertised owing to circumstances beyond their control. The Show will be held at Bulwell Youth Club, Cowley Road, Bulwell, Nottingham. Benching is from 10 a.m. to 5 p.m. Revised schedules can be obtained from Mr. J. Swallows, Show Secretary, 273 Wicklow Court, Hucknall, Nottingham.

26th September, CHESTERFIELD & DAS Open Show. Clay Cross Social Centre, Chesterfield Road, Clay Cross, Chesterfield, Derby. Entry 50 off魅力与精神. Adrian Moore & Son, 4 Adkins Avenue, Chesterfield, Vork. Details: Mr. G. A. Allen, 41 Adkins Avenue, Chesterfield, Vork.

26th September, NORTHAMPTON & DAS Open Show, The Old Hall, Northampton. Details: Mr. L. W. Crowder, 114 Arborfield Avenue, Northampton.

26th September, GOODERS-END AS Open Show. The St. John Ambulance Hall, Knottingley, Yorkshire.


6th October, EAST LONDON & PA Open Show. Forest Road, East Ham, London. Details: Mr. T. Sutherland, 21 Bivering Gardens, East Ham.

11th-12th October, FNAS BRITISH AQUARISTS FESTIVAL at Belle Vue Gardens, Manchester.

11th October, SHERWOOD AS Open Show. Thoresby Minors Welfare Hall, Edwinstowe, Mansfield, Notts. Details: Mr. R. A. Johnson, 17 St. James Avenue, Westhay, Mansfield, Notts. NG19 4YF.

11th October, DONCASTER & DAS Open Show. Doncaster Social Club, St. Mary’s Road, Doncaster. Details: Mr. N. D. Wood, 1165 Woodhouse Road, Notts. NG19 4YF.

Continued on page 204
used to
got
GUSSIE Fish Food Flakes

Now they get
Armitages

It's Armitages quality that you've been buying all along, under the brand name of Guussie. Now we've decided to come right out and call our fish food flakes by the name found on so many fine pet products — Armitages. Don't worry, the fish flakes are still the same balanced formulae of protein, including fish liver, insect eggs, aquatic plants, fish meat, fish roes and cod liver oil, and the same clean food that never clouds the water or blackens the gravel.

And we haven't fiddled with the sizes. There are still standard, large and 10 oz. drums for Cold Water Fish Food Flakes and standard, large, breeder size and 10 oz. for Tropical Fish. But there is one big difference you'll notice as soon as you pick up a new supply of Armitages. The drums are now plastic. Watertight, Mildew-proof. Lightweight. We couldn't make our product any better so we found a better way to package it.

Budding aquarists can still get *GUSSIE* Food, Ant Eggs and Daphnia for their goldfish.

ARMITAGE BROS. LTD. ARMITAGE HOUSE, COLWICK, NOTTINGHAM NG4 2BA Telephone: (0602) 241031

The firm that cares for your fish

"I saw your advertisement in PFM"
WINGATE of WINCHESTER
7 MARKET STREET
Tel 2406
for HEALTHY TROPICAL FRESHWATER AND MARINE FISH—and A COMPREHENSIVE STOCK OF AQUARIUMS AND ACCESSORIES. Main stockists of JUWEL and GEM aquariums.
Est. 1948


3rd November. GSGB Quarterly Meeting. Cooper Hall, Red Lion Square, Holborn, London, WCI, 8-30 p.m.

4th November. MIXEDEN TBF Open Show. Venue as of details later.

11th November. HARTEPOOL, AS
Open Show. Longford Hall, Barton Causeway, Darlington. Details Mr J. Warder, 40 Jubilee Road, Hartlepool, Co. Durham, TS26 8BW.

11th November. WALTHAMSTOW & DAB Open Show. Details to be announced.

17th November. BENDON CON- GREGATION (provisional date).

18th November. KINGSTON & DAG.
SOUTH PARK AQUATIC STUDY SOCIETY. Combined Open Show. V.E. Centre, Barnton Road, Kingston, Surrey.

October 20th. Salisbury. Mr D. J. Mackay, 76 Edgewer Road, New Milton, Hants.

November 20th. FRAS Assembly. Cooper Hall, Red Lion Square, Holborn, London, WC1, 8-30 p.m.

December. HORSFORTH AS 4th Open Show. New Civic Hall, Stanningley, Pudsey.

Classified ADVERTISEMENTS

AQUATIC SUPPLIERS

OVER 150 VARIETIES: tropical, marine and pond fish—for personal shoppers only. Kingsfishers, 30B Croydon Road, Beckenham, Kent. Phone 01-650 3716. Closed Wednesdays.

M.S. TROPICAL FISH (Maurice String-Aquarist). Church Road, Bishops Cleeve, Cheltenham, Glos. We have the finest selection of tropical marine in Gloucestershire; also a comprehensive selection of freshwater tropical fish, plants, and all other aquarium requirements. Phone 0245-267 3077. Open till 7.30 p.m. weekdays.

CLASSIFIED ADVERTISEMENTS
Rates: 4p per word (minimum charge 40p); Box no. 10p extra if required. Remittance with order to be sent to PetFish Monthly, 554 Garratt Lane, London, SW17 0NY.

RUSTPROOFED AQUARIUM, ornamental stands, glazing cement. Equipment manufacturers: A.A. Wellby, Barton, Ormskirk.

MISCELLANEOUS
BADGES. Every Society needs bright enamal badges. For best service and quality contact H. E. V. Coomes Ltd., 14-15 Frederick Street, Birmingham B1 3HE.


REPTILES

BOOKS
WANTED by collector. Copy of 'Vivarium and aquarium keeping for Amateurs' by A. E. Hodge. Older books on the hobby purchased for good prices. Box PF58.

BIND your copies of PetFish Monthly as you receive them. Binders E1.10(83) each post free from PetFish offices.

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


Tested and Tried Since 1956—the Original WINDMILL PREMIER BIOLOGICAL FILTER
VERBRO AQUARIUM PRODUCTS

ALL THE BEAUTY OF CONTEMPORARY STYLING

A striking new concept in Aquarium design. With
gracefully shaped angles and crystal clear glass panels.
Sensibly sealed on the inside to ensure unobtrusive
leak-free joints. Definitely different—at economical
prices

- Reasonably priced.
- Won’t rust, corrode or chip.
- Cleans with a wipe.
- Stands and covers TELECON
  COATED for extra protection.
- Crystal clear glass panels.
- Silicone rubber sealed.
- Ideal for marine fish and salt
  water aquariums.

Manufactured by: VERRINDER BROS.
42 Ladbrook Road, South Norwood, London, S.E.25 01-653 2784

"I saw your advertisement in PFM"
Aquatabs make feeding time fun to watch.

Aquatabs are a great idea. Press one on to the inside of your tank and at once you will see it begin to dissolve.

As if by magic, your fish will come swimming to it, eager to feed.

It's something that is great fun to watch. And good for them too.

Each Aquatab contains a balanced mixture of flaked and freeze-dried foods. Good things like roe, shrimp, liver, beef heart, spinach, lettuce, cod liver oil, milk powder, brewers' yeast and vitamins.

So they couldn't feel better.

And Aquatabs are a boon when you have to leave the feeding to someone else. It's easy to give the right amount of food with Aquatabs so you avoid trouble from overfeeding.

Ask for Aquatabs. 24 Tablets 14p.

Micky Aquarium
in NEALS NURSERY
Heathfield Road, London, SW18
Phone 01-874 2037

We have a large selection of Tropical and Coldwater Fish in stock.

NOW IN STOCK
MARINE FISH

Plus a big selection of tanks, plants, gravel and fish foods

Open 7 days a week
Weekdays and Saturdays 8.30—5.45
Sundays 9.0—4.45

BE CERTAIN YOUR TANK IS
EF(FISH)ENT
USE
DISEASOLVE
(MUCH MORE THAN AN ANTI-SEPTIC)
EFFECTIVE AGAINST VELVET FINROT, POPEYE AND BACTERIAL INFECTIONS OF THE GILLS

NOT FORGETTING
SCANKURE (for White Spot)
FLOURISH (for better plants)
AND
SNAILSGON

ALSO
SURESYNTH FILTER WOOL
(COMES IN THREE SIZES)

In case of supply difficulty write to:

CAGEX Accessories Ltd
UNIT 2
FARBURN INDUSTRIAL EST
FARBURN AVENUE
SLOUGH, BUCKS
Telephone: 33922 or 33944

Please mention PFM when writing to advertisers
HUTCHINSON

SALES UNITS

39/41 Wicker, Sheffield 3

New D.I.Y. Display Unit

Two standard sizes, to take six or eight tanks, 24" x 12" x 12" each, stand dimensions 84" high, 50" wide and 13" deep, the bottom tanks standing 6" from ground. The unit is made up from 1" square section Silver Steel built to take 6 or 8 - 24" x 12" x 12" tanks, or 1 - 48" x 12" x 12" tank on each shelf. These are of water repellent polyurethane marine ply. All the electrical wires are contained in a wooden channel on the back. A rubber socket outlet is provided for each tank, plus an extra socket on the top board for the pumps, which also contains the control switch for fitted lighting. All the convertagears are mounted on the top board and left open to keep cool (to comply with E.E.C. regulations). The appearance is also enhanced by the use of perspex panels which give easy access to the fish.

The prices for the units are:

MK1, 48/8/2412 open, 8 tanks, 4" legs, £100 delivered.
MK1, 48/8/2412 open, 6 tanks, 12" legs, £90 delivered.

Tanks and kits, either part or complete - extra as required, e.g.:

Unit No. 1 NU-GOLD tanks, heater stats thermometer, clips, tees, airline, clamps, filters, (box), wool, carbon, pumps for £70 complete.
Kit No. 2, as above with cheaper p/a P.V.C. coated tanks plus all the kit for tropical fish keeping £60 complete.
Six tank unit kits proportionately less in price.
All units delivered with electrical plugs, for easy installation.
Deluxe units still available.

Cut out this coupon & post now with 10p P.O. (Refundable on first purchase) for all lists.

Name

Address

Aquarist

“I saw your advertisement in PFM”
WINDMILL PRODUCTS
SUPER AIR REJECTOR Aquarium Cleaner
Amazing Cleaning Power and Telescopic Action

AQUARISTS
WALTER R. SMITH LTD.
39 TIB STREET, MANCHESTER M4 1LX
Telephone: 061-832 2961

Stockists of:
Gem, Juwel, Hyware and Gold Star Aquariums, etc.
Tropical, Coldwater and Tropical Marine Accessories.

TROPICAL FISH HOBBYIST MAGAZINES
Many Back issues available
commencing late 1959.
Up to December 1971 — 23p
Later issues — 25p
Prices EACH including postage.

Show room
16 Whittle Street,
off Tib Street

Trade enquiries welcomed.
Suppliers to Educational and Municipal Authorities.
CLOSED SUNDAY AND MONDAY THROUGHOUT THE YEAR

YOU WANT THE BEST
FISHES?
TROPICAL, FRESHWATER,
MARINES, PLANTS:
Direct from BREEDERS
Contact: GARDENIA AQUARIA
26 JALAN TERUBOK
SINGAPORE 20
Cables: Brutos

BARRINGTON
AQUA CENTRE
The Square, Barnstaple.
Devon’s leading suppliers of tropical fish, coldwater
fish, aquatic plants, cage birds of all types, books
and equipment.
Hours: Mon. 2.00 a.m. — 6.30 p.m.          PTA
Tues. 10.0 a.m. — 6.30 p.m.         MEMBER
Wed-Sat. 10.0 a.m. — 8.00 p.m.
Tel: Shop—Barnstaple 2203.  (Home: Hillcombe 2017)
Trade enquiries invited.  Props. Pat & Barry Crone.

WINDMILL BREEDING TRAP
The Trap with the Multiple Uses

"I saw your advertisement in PFM"
Make the diet balanced and varied.

Fish are quite human in one respect. They do like a varied diet. But it must be a balanced one.

The best way to make sure they get it is to give them the best food you can. And that means Phillips Fish Foods — the result of scientific research and comprehensive trials in experimental aquaria.

Leading aquarists and fish breeders know this. And they vary the diet with Phillips Flaked Fish Foods, Phillips Maxiflakes and Phillips Multifreeze.

Make sure your fish get these nourishing foods.

Phillips Flaked Fish Foods
A nutritious high-protein food containing liver, fish and meat meals, insects, crustaceans, vegetable matter, brewers' yeast, milk powder and cod liver oil. Rich in vitamins and minerals. 44% protein. Drum $1.35, 1 oz. 34¢, 6 oz. 57¢, 1 lb. $1.73.

Phillips Maxiflakes
Larger flakes for hand feeding the larger tropical fish. 1 oz. 34¢, 1 lb. $1.73.

Phillips Multifreeze
A 100% freeze-dried blend of seven nourishing foods for tropicals and marine fish. Drum 27¢.

Phillips Fish Foods — the best that cost less.
PHILLIPS YEAST PRODUCTS LIMITED, PARK ROYAL ROAD, LONDON NW10 3IX.

"I saw your advertisement in PFM"
To build themselves up for the winter, your pond fish need

Datam
POOL DIET Pellets
—the established brand
—NOW!!

Datam Pool Diet consists of high-protein pellets in assorted sizes to suit all grades of pond fish. Packed in large moisture-resistant drums. Because they are the best—make sure you have a good supply in NOW!

We need hardly remind you that Datam Pond Fish Food is the leading brand in its field—so much so that we can only just keep pace with the demand!

ASK YOUR FRIENDLY NEIGHBOURHOOD DATAM DEALER

Factors and
Trade enquiries: DATAM PRODUCTS
PRINCESS WORKS, STATION ROAD, BEESTON, NOTTS.
For the best in Aquatic Supplies

£460
Prize
Monies

£460
Prize
Monies

BRITISH AQUARISTS’ FESTIVAL
BELLE VUE, MANCHESTER, OCT 13TH–14TH 1973

Saturday 10 a.m. to 6 p.m.
Admission 35p, Children 22p

Sunday 10 a.m. to 4 p.m.
Includes B.A.F. Zoo and Gardens

Trophies for all Classes, 38 Major Awards, B.A.F. Lapel Badges
A & P Festival Prize Cards

The Aquarist and Pondkeeper
Champion of Champions £21 Best in Show £15.75
Society Stand Display 1st £50, 2nd £25, 3rd £15, 4th £10
Consolation to all unplaced Stands £5

Exhibitors over 50 miles radius of Belle Vue £10 consolation
Every class winner £1.50 when not awarded higher monies

Fleecy of Snack Bars and Restaurants Parking for Thousands of Cars and Chars

Organised by
THE FEDERATION OF NORTHERN AQUARIUM SOCIETIES
THE FEDERATION

ALL Enquiries to B.A.F. Organiser G. W. COOKE, Field Hill, Batley, Yorks

Please mention PFM when writing to advertisers
AUTO FEEDER
FOR CONTINUOUS HIGH PROTEIN FEEDING
—the easy way to Success
for less than 50p

This new idea solves the problem of what to do with your fish whilst you are away for a long weekend or on holiday. The AUTO FEEDER allows you to safely leave an average community tank of 35 fish for a week. For longer periods an economic refill can be easily fitted by someone with no idea about fish-keeping, thus preventing those holiday tragedies.

NO PARKING PROBLEMS AT:
CATFORD AQUARIA
72 BRADGATE ROAD
RUSHEY GREEN, S.E.6
Tropical and Coldwater Fish Ponds, etc.
Proprietor: K. N. WELLS member N.W.A.S.
Tel 01-690 3834 Open 6 days a week
Late night Friday—Open Sunday morning

The AQUARIUM SHOW 1973
Friday 2nd November to Sunday 4th November
Royal Horticultural Society's Old Hall, London SW1
TRADE DISPLAY SPACE AVAILABLE
Apply: Show Organiser
554 GARRATT LANE, LONDON SW17 0NY

The fish will know the best
When YOU put it to the test

VITALITY Conditioning Food: Forms a valuable supplement to all tropical fish as a conditioner providing good health and longer life. Conditions fish for breeding.

VITAWIL Staplefood: Represents the ideal basic food for all tropical fish. Highly nutritious and laboratory-tested, it is readily accepted by all species as a staple-diet.

ROSAWIL Colourfood: Excellent supplementary food for the promotion of colour and spawning condition of all tropical fish.

These foods are made exactly to the taste of your fish. Their unique formulae have absolutely no equal.

“I saw your advertisement in PFM!”
**UNIQUE BIOLOGICAL FILTER**

**FOR TROPICAL AND MARINE OR COLD WATER AQUARIAS**

*Fit it—Forget it!*

This filter, which will operate from a standard air pump, was designed especially to meet the exacting demands of the modern aquarist. The design of the base and the large bore air-lift (which can be fitted either end) give the high rate of filtration necessary even for marines.

Nothing but water can get beneath the flush fitting base once it has been installed and no further attention is necessary.

**OBTAINABLE FROM YOUR USUAL SUPPLIER NOW! (OR DIRECT—add 17p p&p)**

These three sizes, used singly or in multiples will fit the standard range of aquaria.

9” x 17” 98p including VAT

11” x 17” 106p

11” x 23” 109p

Manufactured in England by **ALGARDE** 401a Ripple Road, Barking, Essex

---

**DMO PRODUCTS**

**66 GEORGE STREET CROYDON, SURREY**

<table>
<thead>
<tr>
<th>FOOD</th>
<th>Our Price</th>
<th>Usual Price incl. V.A.T., incl. V.A.T., and P &amp; P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramin 8 oz.</td>
<td>£2.32</td>
<td>£2.12</td>
</tr>
<tr>
<td>Tetramin 2 lb.</td>
<td>£7.99</td>
<td>£7.19</td>
</tr>
<tr>
<td>Tetramin Lge. flake (12)</td>
<td>£8.34</td>
<td>£7.65</td>
</tr>
<tr>
<td>Phillips 1 lb. 2 oz.</td>
<td>£1.73</td>
<td>£1.66</td>
</tr>
<tr>
<td>Phillips Lge. flake</td>
<td>£1.58</td>
<td>£1.39</td>
</tr>
<tr>
<td>Phillips C/water</td>
<td>£1.58</td>
<td>£1.39</td>
</tr>
<tr>
<td>K.B. Vit-a-min 1 lb.</td>
<td>£2.42</td>
<td>£2.39</td>
</tr>
<tr>
<td>K.B. Vit-a-min 2 lb.</td>
<td>£4.46</td>
<td>£4.19</td>
</tr>
<tr>
<td>Pond Pride Breeder</td>
<td>£2.17</td>
<td>£2.06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AIR PUMPS</th>
<th>Our Price</th>
<th>Usual Price incl. V.A.T., incl. V.A.T., and P &amp; P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiger</td>
<td>£5.93</td>
<td>£5.58</td>
</tr>
<tr>
<td>Zooboko 300</td>
<td>£5.85</td>
<td>£5.39</td>
</tr>
<tr>
<td>Wise 120</td>
<td>£12.66</td>
<td>£11.99</td>
</tr>
<tr>
<td>Wise 300</td>
<td>£25.85</td>
<td>£23.99</td>
</tr>
</tbody>
</table>

Terms: Cash with order or C.O.D.

Satisfaction or money refunded.

Prices subject to alteration 1 month from date of publication.

---

**POWER FILTERS**

<table>
<thead>
<tr>
<th>Power</th>
<th>Our Price</th>
<th>Usual Price incl. V.A.T., incl. V.A.T., and P &amp; P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airstream Power</td>
<td>£8.17</td>
<td>£7.25</td>
</tr>
<tr>
<td>Nuova Turbinette</td>
<td>£17.07</td>
<td>£15.49</td>
</tr>
<tr>
<td>Nuova Turbo</td>
<td>£18.58</td>
<td>£16.94</td>
</tr>
<tr>
<td>Eheim 366</td>
<td>£20.65</td>
<td>£18.49</td>
</tr>
<tr>
<td>Eheim 368 C/ Water</td>
<td>£20.45</td>
<td>£18.32</td>
</tr>
<tr>
<td>Eheim 466</td>
<td>£22.96</td>
<td>£20.96</td>
</tr>
<tr>
<td>Dafion</td>
<td>£22.14</td>
<td>£19.58</td>
</tr>
</tbody>
</table>

**PONDS**

<table>
<thead>
<tr>
<th>Power</th>
<th>Our Price</th>
<th>Usual Price incl. V.A.T., incl. V.A.T., and P &amp; P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proops Pump</td>
<td>£10.40</td>
<td>£9.99</td>
</tr>
<tr>
<td>K.B. Pond Filter</td>
<td>£4.39</td>
<td>£3.99</td>
</tr>
<tr>
<td>Aqua Glow Lighting</td>
<td>£9.90</td>
<td>£9.99</td>
</tr>
</tbody>
</table>

**SUNDRIES**

<table>
<thead>
<tr>
<th>Power</th>
<th>Our Price</th>
<th>Usual Price incl. V.A.T., incl. V.A.T., and P &amp; P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozoneking Ozoneizer</td>
<td>£18.31</td>
<td>£13.85</td>
</tr>
<tr>
<td>Edick Ozoneizer</td>
<td>£18.93</td>
<td>£17.67</td>
</tr>
</tbody>
</table>

Please mention PFM when writing to advertisers.
BEND & EXTENSION AIR-LIFT for the ALGARDE UNDER-GRAVEL FILTER

Fits straight on to the existing air-lift tube of the filter.
Prevents splashing and staining of hoods and cover glasses.
Extends to height of 20 in. from filter base.
Forms an effective silencer on filters used without air stone.
Used with the outlet of bend at water level creates a current effect along top of water.
Bend can be lifted above water level if preferred. Height of lift dependent on air supply.
Does not prevent the use of an air stone.

Obtainable from your local Pet Store now, Price £2.50 + VAT 25p

If you wish to order by post send 33 pence (Cheque or P.O.) to cover Kit and Post and Packing.

ALGARDE, 401a RIPPLE ROAD BARKING, ESSEX.

MURKY GARDEN POND?
CLOUDY AQUARIUM?
DIRTY GOLD FISH BOWL?
WHITE SPOT TROUBLE?

Bioquatic Laboratories produce a unique range of quality aquatic products which effectively deal with these problems. If unobtainable in your area write direct and include 5p for post and packaging.

ACUREL®E will keep the water CLEAR in your garden pond. 2 oz. to treat approx. 500 gals. Retail 43p. 4 oz. to treat approx. 1000 gals. Retail 70p.

ACUREL®F will keep your aquarium CRYSTAL CLEAR and improve filter efficiency by over 500%. Retail 43p.

ACUREL®GOLD will keep your goldfish bowl CLEAN for many weeks without having to repeatedly change the water. Retail 25p.

ACUREL®O is a well established, reliable cure for WHITE SPOT fungus and algae. Use it regularly as a disinfectant and preventative. In capsule form for accurate easy to administer dosages. Retail 34p.

ACUREL products are chemically pure and if used as directed will not harm your fish, plants and live foods etc.

TRADE ENQUIRIES TO:
Bioquatic Laboratories
161 Rustlings Road.
SHEFFIELD S11 7AD

"I saw your advertisement in PFM"
Your Fish Need a Lift— the
WINDMILL BOOSTER AIR-LIFT

MIDLAND AQUARIUM & POOL SOCIETY

30th ANNUAL OPEN AQUATIC SHOW 1973
Including THE INTERNATIONAL HERPETOLOGICAL SOCIETY OPEN SHOW
15th-19th AUGUST
BINGLEY HALL BROAD STREET BIRMINGHAM

Admission: Adults 15p, children & O.A.P. 10p
Organised parties at reduced rates

20 Coldwater Classes • 26 Tropical Classes • Marine Tropicals
Decorative Aquaria • Class 50 • 32 Trophies • Trade Stands

Hours of Opening
Wednesday 2.30-10.00 p.m. Thursday 12.00-10.00 p.m.
Friday 12.00-10.00 p.m. Saturday 10.00-8.30 p.m.

BAR & BUFFET CAR PARK approx. 3 mins QUALITY RESTAURANTS IN VICINITY

For further details contact
HON. SEC. M.A.P.S. Mr. T. GRICE
Phone 021-554 9064 46 Perrott Street, Winson Green, Birmingham 18

NEW HAW AQUARIA
(BYFLEET 4932)
Tropical, Coldwater and Marine
All fish products
All glass tanks made to any size
Send S.A.E.
Open Mon-Sat. 9-6 p.m.
Friday 7-10 p.m. Closed Wed. 1-6 p.m.
27 THE BROADWAY,
NEW HAW,
WEYBRIDGE, S.

LODDON AQUARIA
32 Old Reading Road
Basingstoke, Hants
Specialist for TROPICAL MARINE & COLDWATER FISH,
LIVINGROCK, INVERTEBRATES
Live foods available
PLANTS & EQUIPMENT
Open:
Mon-Sat 9.30-5.30 Sun 10-1

WINDMILL Straightway
WINDMILL 4-Way
WINDMILL T-Piece
WINDMILL Clamp

AIR CONTROLS

Please mention PFM when writing to advertisers
H. TISBURY & SONS
SPICE PITTS FARM, CHURCH ROAD,
NOAK HILL, HAVERING, ESSEX
RM4 1LD
Phone Ingrebourne 41376
BREEDERS OF HIGH-CLASS FANCY GOLDFISH

VEILTAILS
This Season’s selected youngsters
are now ready

S.A.E. FOR ALL ENQUIRIES PLEASE. FISH SENT BY RAIL PLEASE ADD £1 CARRIAGE
Summer hours: Mon-Sat 9.30 a.m. to 8 p.m. Sun 10 a.m. to 6 p.m.
5 MINUTES BY CAR FROM GALLOWS CORNER ROUNDABOUT (A12)
By Public Transport from Romford Station no. 174 bus to door
VISITORS WELCOME

In our Showrooms at all times
A wide variety of rare and interesting specimens of tropical fish
Growing selection of Marine fish
Complete selection of Aquatic Equipment

Open Daily
9 a.m.-6 p.m. 9 a.m.-8 p.m. each Friday
Open Saturdays to 5.30 p.m.
Closed all day Sunday

keith barraclough AQUARIST LTD
568 GREAT HORTON ROAD, BRADFORD BD7 3HW, YORKSHIRE
Tel: Bradford 76241
STD 6274

“I saw your advertisement in PFM”
K. S. PRICE
ARNOLD'S YARD
OLD MARKET PLACE
ALTRINCHAM, CHESHIRE
Tel: 061-928 7957
(rear of the Unicorn Hotel)
AND
265 BURNAGE LANE
MANCHESTER 19
Tel: 061-432 5406
Manufacturers of Aquaria
Tropical, Marine and Coldwater Fish
Plants, Live Foods and Accessories
SPECIAL OFFER—AUGUST ONLY
for callers at either shop
Plastic-trimmed all-glass aquarium and cover glass
24 x 12 x 12 = £3.50
24 x 15 x 12 = £3.75
Send S.A.E. for our retail price list

AUTO FEEDING
FOR HOLIDAYS AND WEEKENDS
for less than 50p

With the new AUTO FEEDER
Liverine enable you to supplement the varied diet of dry and live foods with continuous high protein feeding throughout the day. Refills available at just over half the price of the original feeder, now enable you to achieve excellent growth results economically.

GILLWAY AQUATICS
14 THE PRECINCT, TAMWORTH, STAFFS. B79 7AE
Tel. TAM 65617

WHOLESALE-AQUARISTS

MAIN AGENTS FOR THE FABULOUS SERA RANGE OF FOODS (in our opinion the finest flake foods made).

MAIN AGENTS FOR ELITE FOOD— the acceptable non-flake food

OUR MARINE DEPARTMENT OPENS ON SATURDAY 25th AUGUST COME AND SEE IT

CASH AND CARRY DEPARTMENT FOR RETAILERS IS OPEN
TACHBROOK TROPICALS LTD
244 VAUXHALL BRIDGE ROAD LONDON S.W.1 Telephone 01-834 5179

For T.F.H. Hard- and Soft-cover Books. We Carry Full Range—Why not Visit Our Store or Use Our Postal Service

- Anabantids, Gouramis and Related Fishes £2.30
- A Guide to Freshwater Aquarium Fishes (Hervey & Hems) £2.75
- Goldfish and Koi in Your Home £3.45
- Goldfish Pools, Water Lilies & Tropical Fish £3.45
- Handbook of Tropical Aquarium Fish £2.26
- Innes: Exotic Aquarium Fish £1.90

- Caribbean Reef Fish £5.25
- Cichlid Handbook (Goldstein) £4.30
- Diseases of Fish (Bacterial) £3.25
- Diseases of Reptiles (Books II, III) £3.60
- Koi of the World £8.50
- Koi £4.50
- Home Aquarium £2.50
- Live Jewels (Fancy Carp) £4.50
- Livebearing Aquarium Fishes (Kurt Jacobs) £6.00
- Parasitology of Fishes £6.00
- Poisonous Marine Animals £3.25

- Tropical Aquarium Fishes Freshwater or Marine £2.50
- Exotic Fish Hard Cover £6.30
- Looseleaf £8.50
- Binder £2.05
- Marine Fish Looseleaf £8.50
- Binder £2.05
- Pacific Marine Fishes (Books I & II) £8.50
- £2.87
- Rasbora (Brittan) £4.30
- Sea Anemones £2.60
- £80p
- Spawning Problem Fishes Books I, II £1.25

Postal Charges for orders up to £1, 16p; £2. 35p;
up to £4, 30p; up to £6, 45p.
**SHIRLEY AQUATICS LTD**

**WATER PLANT NURSERIES AND FISH HATCHERIES**—Phone: 021-744 1300

Stratford Road, Monkspath, Shirley, Solihull, Warwickshire

<table>
<thead>
<tr>
<th>TROPICAL AQUARIUM PLANTS</th>
<th>Collection of Tropical Floating Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIAL OFFER</td>
<td>including Azolla (Fairy Moss), Salvinia,</td>
</tr>
<tr>
<td>Nicely growing Lace Plants</td>
<td>Pistia (Water Lettuce),</td>
</tr>
<tr>
<td>60p ea. 3 for £1.50</td>
<td>Ceratopteris (Floating Fern)</td>
</tr>
<tr>
<td>Post free</td>
<td>50p ea. Post free</td>
</tr>
</tbody>
</table>

| HI-FIN SUNSET PLATY     | Assortment of six different |
| VARIATUS                | Cryptocorynes              |
| Beautiful pairs £2.50   | £1.50 post paid            |
| pair Callers only       |                          |

| Large breeding pairs    | Limited number of Japanese Lionheads, |
| Japanese Comet-tailed Goldfish and Comet-tailed Shubunkins | Celestials, Orandas and Bubble Eyes |
| From £2.50 pair         | from £1 each                |
| Callers only            | Good stocks of Fantails, Moors, |
|                         | Telescopic Fantails, Shubunkins and |
|                         | Comet-Tailed Goldfish       |
|                         | From 25p each               |

| Beautiful plants of PONTEDERIA CORDATA | Pale pink WATER LILIES |
| (BLUE PICKEREL)                  | Flowering size £1 each     |
| 25p each. 3 for 50p. Callers only | If by post add 25p         |

**GOOD STOCK OF NISHIKI KOI (JAPANESE COLOURED CARP)**

**IN WONDERFUL ASSORTMENT OF COLOURS**

From 3"-12". From £1.50/£30 ACCORDING TO SIZE AND COLOUR.

*SPECIAL SPECIMEN FISH AT INDIVIDUAL PRICES BY NEGOTIATION*

**PLEASE NOTE**—All enquiries requiring a reply MUST be accompanied by S.A.E. Our premises are situated on the main, Stratford-Birmingham road, 2 miles from Birmingham, Micround "Town" Bus No. 150 from Saltash. Stratford, pass the door, sight as "The Crown". Monkspath.

**HOURS OF BUSINESS—NOVEMBER-MARCH 9 a.m.-5 p.m., APRIL-OCTOBER 9 a.m.-6 p.m.**

**CLOSED ALL DAY SUNDAY AND MONDAY**

**TERMS OF BUSINESS**—Cash with order please. Fish sent by rail. Tropical minimum order £7.50, deciduous container and carriage £1.50. Goldfish minimum order £5 plus 25p carriage. Plants by post (minimum order £5.00) please add 50p post and packing.

PRINTED BY ASLARD AND SON LTD, BARTHOLOMEW PRESS, DORKING