

OCTOBER 1975

25p

Pet **Fish**

PRACTICAL FISHKEEPING MONTHLY



Contents include:

Acara Breeding

Air-Pump Test Report

Colour in Guppies

Japanese Hospital for Sick Fishes

American Sunfishes

Blind Cave Characin Spawning

Marine Butterflies

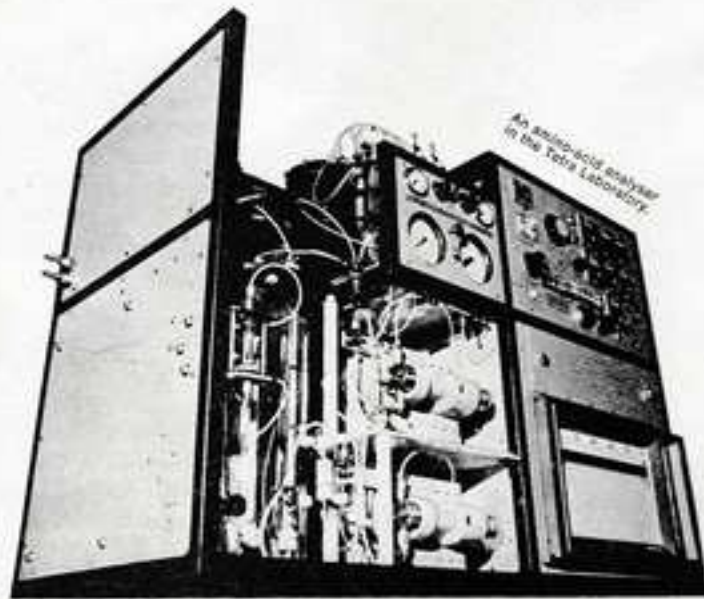
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Comments and Quotes

● Guide for users of coastal scenic areas

Coastal Code

THE exodus to the seaside of all those who could manage it during the long, hot summer must have delighted the human inhabitants of the coastal resorts but may have had a very different effect on the myriad of those other, largely unseen and often unthought of, dwellers in those areas—the indigenous fauna and flora. Bearing in mind the increased pressure being exerted on the wild life of the shores and shallow seas, the Natural Environment Research Council have printed and published THE COASTAL CODE "so that we can all enjoy our natural inheritance and leave it unspoiled for others"—"which in our ignorance we may inadvertently destroy".

Our attention was drawn to this by its publication in the Bulletin of the British Ichthyological Society (secretary: Mr D. Marlborough, 60 Newfields, Welwyn Garden City, Herts) and it contains such sound advice that we think it should gain as wide an audience as possible. The Code is shown below.

Disturbance may mean death

The coast is home for many plants and animals and they may be destroyed by our careless actions.

DO NOT subject easily damaged habitats (e.g. saltmarshes, sand dunes and cliff tops) to unnecessary trampling.

DO NOT move rocks unnecessarily, as some of the most delicate and susceptible forms of marine life occur on the under sides of stable rocks and boulders.

DO NOT frighten seals, sea birds or saltmarsh waders as this can affect their breeding cycles and expose their young to predators.

DO NOT spear fish in areas of special interest to conservationists or in the vicinity of other water users. Excessive spearfishing in limited areas can make fish shy and deplete some species.

DO NOT spill detergents, paint, solvents or fuel from boats as these can kill marine life.

MODERATE YOUR SPEED—the wash from a fast boat can destroy saltmarsh banks and swamp nests in estuaries.

SPREAD THE AREA FROM WHICH YOU COLLECT BAIT—bait digging by anglers in limited areas can disturb the local fauna. Always back fill holes as they may be a danger to others.

TAKE NOTES AND PHOTOGRAPHS — NOT SPECIMENS. Collections of plants and animals should be kept to a minimum. Whenever possible leave them for others to enjoy.

DO NOT collect species that appear to be scarce.

LIVE MOLLUSCS AND CRUSTACEANS rarely need to be collected as souvenirs—dead shells can usually be found.

DO NOT collect sedentary organisms such as sea fans as these take many years to grow to adult size.

DO NOT pull up seaweeds unless there is a special reason.

SHELLFISH such as crabs and lobsters take several years to grow to maturity; over-collecting in an area soon depletes the stocks. There are national regulations (e.g. 4½ in. shell width for edible crabs and 9 in. overall length for lobsters) that are aimed at conserving shellfish stocks. Fines can be imposed for not observing these regulations, details of which can be obtained from local sea fisheries committees.

RESTRICT COLLECTION of sea urchins, as they are slow growing and their depletion in an area causes an increase in the growth of seaweeds.

MAKE YOUR VISIT INSTRUCTIVE AND PRODUCTIVE BUT NOT DESTRUCTIVE. Teachers and naturalists

have a special responsibility and should plan field trips carefully with conservation in mind.

TEACHERS AND INSTRUCTORS SHOULD MAKE SURE THE PEOPLE IN THEIR CARE know how to treat the shore and shallow sea and what constitutes "good conduct".

DEMONSTRATE MATERIAL WITHOUT MOVING IT. Often a photograph will serve—if something needs identifying take only the smallest piece for that purpose. Remember "gardening" around objects to be photographed can expose them to danger.

DO NOT mark animals without expert advice. In careless hands marking can kill or expose animals to predators.

DO NOT take repetitive samples from the same locality without advice from experts.

WHEN RECORDING at sites of special scientific interest or nature reserves, send a copy of your results to the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, or the nearest Marine Biological Station.

OBSERVE BYE-LAWS AND BE CONSIDERATE TO OTHERS. National Trust property or Country Parks may have regulations to protect the wildlife. Special care should be taken when visiting these and other areas where the study of the conservation of nature is one of the objectives.

(Copies of this Coastal Code may be obtained from the Natural Environment Research Council, Alhambra House, 27-33 Charing Cross Road, London WC2H 0AX—s.a.s. please.)



LETTERS



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

Aquaria in the Public Eye

AFTER reading your comments in the August issue of PFM, I feel I must back up your remarks regarding ill-kept aquariums on public view. Our company, Harveys Fins & Wings, have been trading in the West End of London for nearly 2 years, and we have been called upon to service a large number of aquariums in this area. These include tanks in a number of public places, such as hotels, doctors' and dentists' waiting rooms, and the foyers of several company offices. The majority of these tanks are generally neglected, due to the owners being very busy professional people, and the fact that there has been no (or very few) reliable traders to whom they could turn for advice or help with regard to servicing.

No aquarist, whether professional or hobbyist, likes to see a badly displayed aquarium. I feel that the main reason

for people getting bad results when they have decided to 'go marine' is purely and simply—lack of advice. Another point—the introduction of fish from different seas invites diseases which their resistance is unable to cope with. If all the fish in one tank were from one area or even one sea, I feel this would perhaps double or even treble their chance of living.

This is one reason why in recent months we have set up a Contract and Service Division (Aquarium Services Ltd.) The managing director of this company (Mr R. Battenburg) tells me that the vast majority of tanks are purchased from dealers merely to enhance the premises. When the set-up aquarium needs servicing, the owners lack the time or inclination. From this time on, interest in the aquarium is lost, and it rapidly becomes an eyesore. This is where we are pleased to come in,

Continued on page 261

Check your fish for vitamin deficiency.

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Swollen gills? Often an indication of a deficiency of nicotinic acid in the fishes diet.

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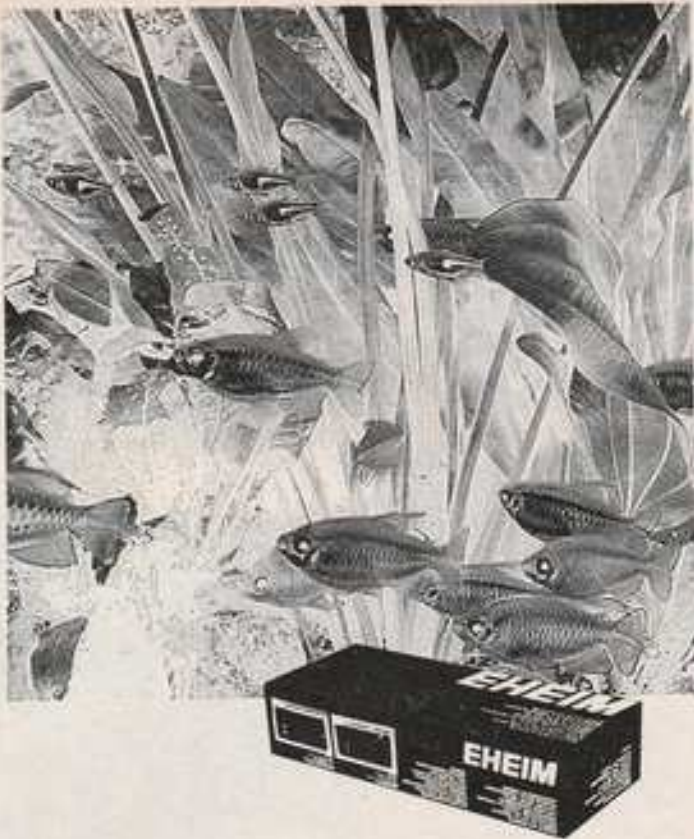


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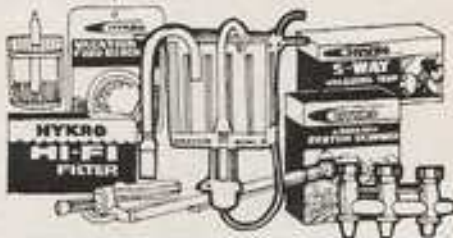
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LETTERS

continued from page 254

and we now offer a first-class installation and maintenance service to these people. I think that you will agree this can only help our hobby and trade to survive, as it so deserves to.

The state of affairs mentioned in the second part of your comments annoys me greatly, as when one is selling a small fish, which will eventually get bigger, it is not very difficult to ask your buyer whether he knows he has purchased a baby monster. Cases of this continually crop up, due to some traders being more interested in money than fish!

ALLAN C. BILLINGTON

*H.F.W. Branch Manager (Selfridges Ltd.)
London, W.1*

New Electrical Regulations

YOU are no doubt aware that the Department of Prices and Consumer Protection intended to introduce new electrical regulations and that these would come into effect on 1st September. This would have been very embarrassing for the aquarium trade, due to the very short notice given.

I am glad to report that, following representations made by a delegation of M.P.s led by our M.P., Sir George Sinclair, implementation of the new regulations has been delayed so that it is now legal to sell existing appliances until 1st October 1976.

In the meantime, we intend to stick to the spirit of the new regulations by selling only units which have been modified in a way intended to comply with the regulation, i.e. so that it is not possible to reach live electrical parts without first using some sort of tool.

J. N. CARRINGTON

*Managing Director, Interpet
Dorking, Surrey*

Simplifying the Job

IN reply to the comments made by Mrs V. Braintree in the 'Letters' section in the August issue, may I point out that if such a person, who was unable to wire up the equipment, were to visit a decent aquatic shop, she would most likely find that the owner would wire everything up for her so that all she had to do on arriving home would be to add water and then switch on.

Owners of respectable aquatic shops, I am sure, are more interested in the furthering of the hobby, which means helping beginners, than exploiting fish just for the profits.

M. W. JONES

*Director, Eve's Pet Shop Ltd.
West Bromwich, Staffs.*

Aquarium on Public View

In last month's Letters, Mr G. A. Tompkins wrote about the marine tank in his office near St Paul's in London. Cliff Harrison has visited Mr Tompkins and photographed him and his eye-catching office marine tank.



Capt. L. C. Betts

THE death of Captain L. C. Betts, M.B.E., on 11th August 1975 in his early seventies, has taken from the leadership of the British aquarists' hobby an outstanding and well-known personality whose work, especially for the fancy goldfish-keepers, has made a lasting impact. As early as 1936 he was writing articles for *WATER LIFE* and two booklets in the *WATER LIFE* series published in 1937 and 1938 were from his pen. During the 1939-1946 war he seemed to become involved in many difficult campaigns, but in the last phase when the Germans were driven from Belgium he managed to keep a few goldfish in his quarters! After the war he became very well known as a writer, speaker, breeder and judge of goldfish.

When the FBAS was resuscitated, 'Goldfish Betts' was there to help. When pet traders re-organised, he was a good advisor and acted as chairman of the Aquatic Traders Association. But the project closest to his heart was to form a society for goldfish fanciers and to raise the quality of the fish bred. Len Betts' close association with the late Dr Robert J. Affleck led to the formation of the Goldfish Society of Great Britain. Bob, who proved to be the foremost British ichthyologist specialising in research into the anatomy, embryology, genetics, diseases and general raising and feeding of goldfish, although a writer and teacher, was introvert. The partnership with the extrovert, ebullient Len was the perfect balance. Len was the man to whip up enthusiasm, gain recruits and loyalty by sheer personality. He was very sociable and lectured to clubs, judging many cold-water shows.

The GSGB was founded in 1948 with Captain Betts as chairman. Subsequently he became vice-president and then president. After studying large numbers of goldfish lent by GSGB members, the Society was ready in 1950 to produce its first goldfish Standards booklet. To the scientific knowledge provided by Bob Affleck, Len was able to add his outstanding knowledge of ideal fish and the judging thereof. The basic principles enunciated in the first



A photograph taken in 1967 of Captain Betts arranging award cards after judging at a GSGB convention

set of GSGB Standards have stood the test of time through two revisions up to 1972.

Len at the time was a Port of London Authority river officer, especially concerned with anti-pollution measures in the tidal waters of the Thames. He cajoled and genially bullied offenders into conforming with the spirit of the regulations. Much additional progress has been made with the cleansing of the Thames since he retired, but due credit should be given to his work in those early days. His job called for a knowledge of the oxygen and general chemical as well as bacterial content of water and, of course, of the treatment of sewage effluent. This led him to become a leading advocate of biological filtration for aquaria and ponds.

He was full of drive, imagination and initiative. An example was his idea that GSGB members should lend good showy fancy goldfish for stocking one of the pools in the Festival of Britain Exhibition, with a stipulation that a notice should be displayed indicating the GSGB participation. Len, of course, could pop in during the day during one of his trips up the Thames

in order to keep an eye on the fish and to feed them. Came the closing of the Exhibition, when Len and I attended on the stipulated day to collect our fish and to return them to the GSGB owners. There was consternation when we found that the pool was empty and the fish sold to a dealer! Fortunately Len had a contract with the Festival Authorities to indemnify us substantially for the loss of these "high quality pedigree fish". The compensation was a welcome addition to GSGB funds in those early days.

In 1950 he wrote: "We are leading no crusade unless it be an appreciation of the goldfish as a fish and the necessity for knowledge if we are to progress. So let Tolerance, Friendship and Good Humour be our watchwords". He would like that to be his message to his successors, the present-day goldfish enthusiasts.

MORRIS CLUSE

President, Goldfish Society of Great Britain

GSGB Presidential Address 1963

Extracts from an Address by Capt. L. C. Betts, as president of the Goldfish Society of Great Britain, to members at the GSGB Convention 1963

It all started 15 years ago when I inserted an advertisement in the Aquatic press, asking parties interested in goldfish keeping to contact me. After a false start, a nucleus of 12 got down to deciding the lines a Goldfish Society should take. Simplicity and freedom from rules and regulations, to be the keynote. Serious study at home was the objective as opposed to numerous meetings and uninformed talks. The meetings were limited to comparing notes and this routine has persisted ever since. As promiscuous crossing of the varieties was the order of the day, it was decided to fix standards for the basic variations found in goldfish, and to fix rigorous standards to protect them against further deterioration.

In the 15 years the Society has been in being, the record of achievement has been substantial, as witness the evidence. For example, so called 'calico' fishes were found to represent two distinct scale groups, one the matt group which would breed 100% true to its group, and nacreous which would only breed 50% true. If 100% nacreous is required it is necessary to mate metallic to matt.

The Society led the way in exposing the disadvantages of a planted aquarium and the advantages of biological filtration in lieu. They provided adequate proof that goldfish lived happy and more healthy in water that was pumped, over water that was without circulation.

Perhaps the most important development was that of the hand spawning technique, which gave greater control over matings and quicker results in establishing improved strains. Much work has been done on parasitical infections, so that whereas thousands of goldfish died each year from flukes, now death by flukes is a rare occurrence. Whereas formerly fungus disease killed thousands of fishes each winter, this also is a rare occurrence. It is true that new diseases appear from time to time, but usually these are brought in by imported fishes and are generally brought quickly under control.

We live in an age of speed and multiplicity of interests. Goldfish keeping has to be shared with other activities, and if it is to survive it must be streamlined to give maximum results for minimum effort. Efficient management of the fish house means better results, and more time to enjoy them. Efficient management will not be achieved when based on outdated shibboleths. Does anyone doubt that, given the opportunity and facility, hand spawning is superior to natural spawning? That circulated pond water in aquaria is better than the so-called 'balanced' aquarium water? If there is a doubt it should be thrashed out, if not, it should be part of the Society policy to say so, as a statement of fact.

The ultimate success or failure of the Goldfish Society rests, as always, on these basic truths:

- (1) The Society is greater than its membership, either individually or collectively.

- (2) It is no better or no worse, than each individual member would have it be.
- (3) Its existence is for the benefit of the goldfish in general, and each member in particular.
- (4) Its strength lies in its appreciation for the truth, and not in its gratification of the individual.
- (5) It is not in itself a philosophy, but through its agency its members can gain strength by absorbing knowledge and enjoying good fellowship.

Schwarzer Air-Pumps on the Test Bench: First BASS Report

In the May, 1975 issue of PFM the preliminary report of the Research Committee of the British Aquarists Study Society (chairman, J. A. DAWES, B.A., F.Z.S., F.L.S., L.I.Biol.; secretary, D. COOK, C. Tech. (CEI), M.I.M.I.) on standardisation tests on air-pumps was published. Tests of a selection of Schwarzer pumps, kindly supplied by John Allan Aquariums Ltd., of Bury St. Edmunds, have now been completed and are reported here.

AS outlined in our preliminary report, each pump was tested consecutively for 28 days under the standard conditions laid down in our original specification, the same apparatus being used throughout (PFM, May). The quantitative results obtained are shown in the accompanying graphs. Several subjective assessments were also made, mainly concerning adjustability, number of diffuser stones operated etc., about which more will be said.

The overall aim of the tests was to obtain a reasonable measure of those aspects that would be useful to the prospective purchaser of an air-pump in making the correct choice for his requirements and in making objective comparisons with other pumps. The latter can obviously only be done if these other pumps have been tested under the same conditions and to some reproducible standards, preferably to those standards laid down in our tests. Should a pump be offered that has not been tested to the same standards, then one must draw one's own conclusions.

The four models tested constitute a range of pumps with outputs from circa 800 ml/minute to 3750 ml/minute. The summary graph shows that they all proved reliable for the duration of the test with some small variations in output which, in normal use, would pass un-noticed. As expected, the biggest pump showed the

biggest fluctuations and the smallest one, the smallest fluctuations. In spite of the relatively larger fluctuations of the biggest pump (SP 402 SLR), in real terms, they constitute at most, a mere 4% deviation from the average flow rate. These minor deviations are, in reality, insignificant for a pump of this strength and should not put anybody off buying such a pump.

The separate graph for the smallest pump (SP 103 SM) is included to show that, as far as we can determine from our tests, outflow is totally unaffected by either temperature or barometric pressure. This may well be the case with most makes of pump but we are of course unable to state this categorically until we carry out the same tests on these other makes.

Noise-levels were measured on the following arbitrary scale: 1, Very quiet. 2, Quiet. 3, Acceptable. 4, Noisy. 5, Very noisy. The smallest pump (SP 103 SM) was noisy at full output, but could be quietened by a small amount of throttling back, probably equal to the resistance that it would encounter if used with an air-stone. The other three were all quiet, the largest (SP 402 SLR) being very quiet at first but becoming audible, but still quiet, during the course of the test.

All pumps can be readily adjusted without going through the usual procedure of having to half-dismantle the pump in the process. They all possess an external

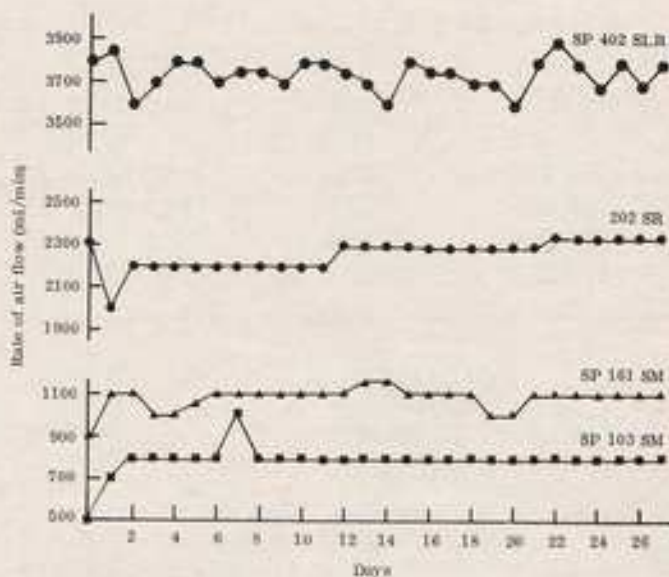
knob for the purpose. The two smallest pumps incorporate mechanical adjustment while the two largest rely on electrical adjustment.

Coming back to the question of number of diffuser stones operated, two pumps were tested in the following way. Manifolded 1-inch square stones of the (now) old-fashioned white texture were used in

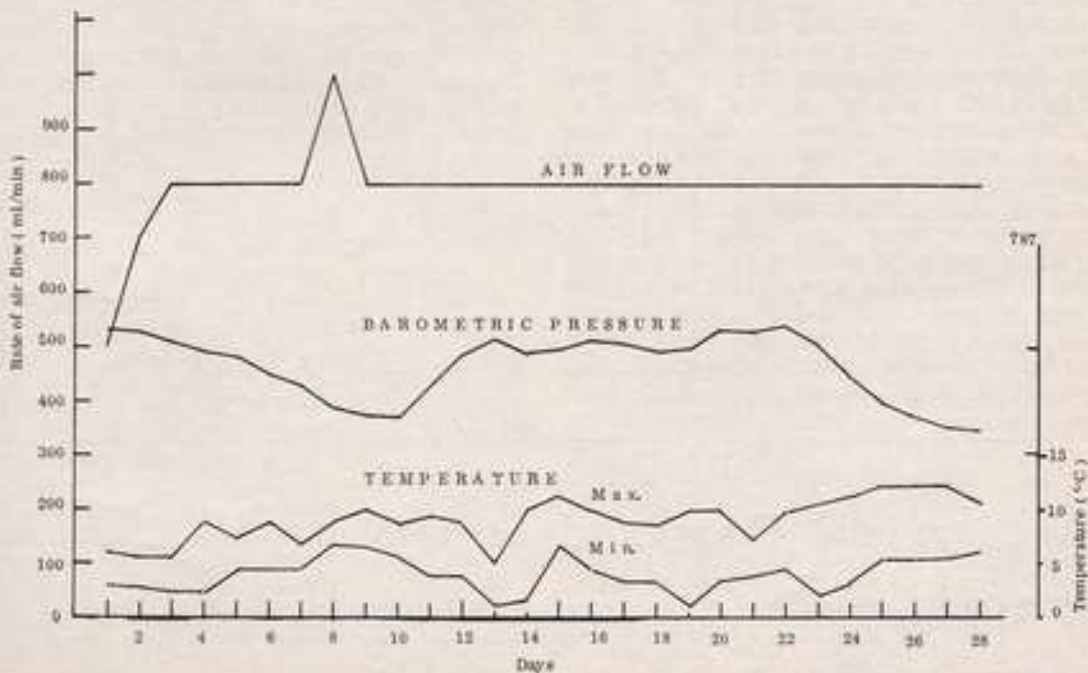
12 inches depth of water. All stones used were brand new and previously unused.

The smallest pump just comfortably operated two stones while the next size up (SP 161 SM) would operate four, provided that the pressures were balanced by the use of control valves. With all four unrestricted, three stones worked well and the fourth passed only the occasional

Right: summary graphs of performances of the four Schwarzer pump models



Below: detailed analysis of conditions and daily performance recorded for the Schwarzer pump model SP103 SM



FOR THE COLDWATER SPECIALIST

The American Sunfishes

By FRANK ORME

FOR the coldwater fish-keeper who seeks something different from fancy goldfish the fishes of the north American family Centrarchidae might provide the answer. These are the sunfishes, a somewhat pugnacious group that is closely related to the perches. In their home waters they are as abundant as the stickleback is in this country, especially in the rivers and ponds of the eastern U.S.A.

Often brilliantly coloured, these active carnivorous fishes can equal some tropical fishes in eye-catching coloration. Many of the species will interbreed and this has given rise to a number of various wild hybrids that differ greatly from their parents. During breeding, pits are dug, in cichlid fashion, which are vigorously defended against all intruders. Shallow water, with a maximum depth of 12 inches, seems to be preferred. It often pays to place a shallow layer of well-washed peat beneath the aquarium gravel, as this will provide the slightly acid conditions which they enjoy in their natural water. Make sure, however, that it is sufficiently covered with gravel to prevent the fish disturbing it.

Normally, a 24in. by 12in. by 12in. tank will be adequate for a pair of sunfish. Plant it in the usual way, ensuring that sufficient density is provided to afford a refuge should one of the fish require a respite from its quarrelsome mate. Sexes in some species are hard to differentiate unless the pair is in breeding condition. Spawning will prove the sexes, at which time they can be noted.

After preparing the pit, or nest, to his satisfaction, the male sunfish will search for the female, who will have spent her time keeping out of his way to avoid being harmed. Having found his intended mate he will commence to court her by shivering and showing off before her. After a time she will show her willingness to

accept him by swimming to the breeding site, to which he will escort her. Hovering side by side, over the nest, with abdomens almost touching, they will deposit and fertilise the eggs. When spawning is completed the eggs will be constantly guarded and the young raised with care. Hatching can take place in around 48 hours. Food for the fry must be live: newly hatched brine shrimps followed by screened daphnia will be found suitable.

The adults themselves are carnivorous and can rarely be persuaded to accept prepared food. Every effort should be made to satisfy their appetite for live food if they are to thrive and remain in good health. White worms, small earthworms, bloodworms, daphnia, mosquito larvae etc. are all eagerly taken and eaten with relish. It will also be found that any small water beetles that may accidentally find their way into the tank will be quickly snapped up. Some sunfish will even kill and eat any snails that may be sharing their home.

Although not really suitable for the outdoor pool, they need no special treatment and will live happily in the coldwater tank provided that it is not allowed to fall much below 45°F. Care should also be taken to see that fish sharing the same quarters are matched in size to avoid excessive bullying and possible losses. Remember the nature of these fish, for the inoffensive goldfish, for instance, would soon be in trouble with a sunfish in their tank!

A number of different varieties of sunfish are known but the following are probably the most popular.

Elassoma evergladei: the pigmy sunfish, which is a native of the region from North Carolina down to Florida. An extremely hardy fish that grows to an adult size of 1½ inches. Two similar species, *E. zonatum* and *E. akefen-*

Continued on page 270

A Cichlid for the Enthusiast



Aequidens portalegrensis

THE aquarist — and by this term I mean the real enthusiast — is really like the stamp collector. He is always wanting something new. He goes into the aquatic shop time and again with the same question on his lips — 'Do you have anything new?'. One may want to brag about owning something unusual; another wants to try to breed a novelty so that he can dedicate himself to yet another problem fish. I gladly admit that I do myself belong to this group and although I have my preferences for some particular species, I am always trying to acquire something new so that I can prove my skill and justify my patience. And that is why, in the autumn of 1973, I acquired from my friend, Herr Hecker, in East Germany, a beautiful pair of these large, but peaceful, cichlids.

The fish withstood the fairly long journey well except for some damaged scales. They were very shy and for the first few days lived hidden away in the 25 gallon (125 litres) tank prepared for them. But I could see that the female had burrowed into the sand from sheer terror and had I not happened to notice it and released her she would certainly have died of shock. It is

By **RUDOLPH ZUKAL**

Photographs by the author

Translated by **F. MARSH**

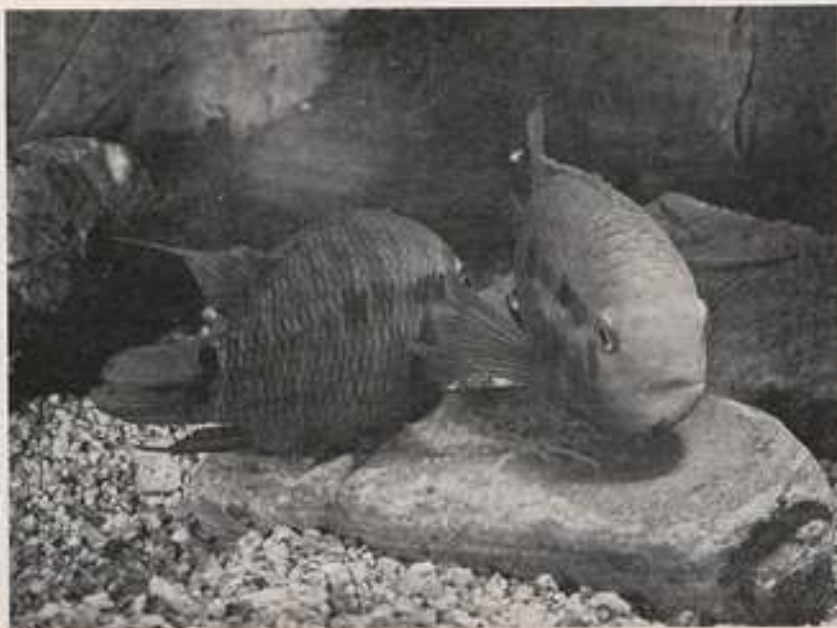
In the picture on the facing page the male of the pair is to the right. This picture shows the female depositing her eggs on a flat stone while the male hovers near and weaves his way around the stone



not always easy to transport older fish and acclimatise them quickly. There is always a risk entailed and it is much easier to take young fish and rear these. But now to our cichlids.

These fish were not being bred very much in my part of the world at that time.

They are fairly large creatures, which reach a size of 10 in. (25 cm.) in their home territory in southern Brazil and Bolivia. My adult fish were 4 in. and 4½ in. (10 and 12 cm.), the male being the larger fish. Sex differences were not recognisable at first sight, although the



Here, the male is beginning to fertilise the eggs laid by the female. Sometimes the pair act at the same instant in depositing ova and fertilising. A rough star pattern is formed by the lines of eggs laid on the stone

female had a somewhat fuller belly. More than anything I was interested in the reasons why we hadn't been keeping and breeding them up to this time, because they'd been imported into Europe from 1913 onwards. It only took a few weeks to find the answer — no exception to the family temperament, these cichlids dug busily in the gravel, made numbers of holes and didn't particularly improve the plants either! However, because they were relatively well behaved during the first few weeks I devoted a lot of attention to them — and it paid off. The holes were prepared as preliminaries to spawning, to be ready for the young, though the actual spawning would take place on a firm surface — as it happened, a flat stone.

As I have already mentioned I kept the pair in a fairly large tank at a water temperature of 70°F (26°C), in neutral, slightly alkaline, tap water at a pH of 7.2 and 18° DH. A large quantity of tubifex worms were not only devoured but a fair quantity were spoiled as, after the fish had swallowed them, the bitten-through worms were just spat out again and all of this produced a sort of 'smokescreen' of red fluid. To cope with this I had to provide much stronger aeration.

The preparation for the actual spawning was made by the fish over a period of several days. Once the site had been chosen the female cleaned it carefully and after about 5 hours the fish spawned. In the space of 2 hours about 500 eggs were

laid and these were looked after by both parents. I am afraid I have to report that this was an unsuccessful spawning. To my great disappointment the eggs had disappeared by the following day; probably the fish were disturbed by something and ate the eggs. This happens with many species, of course. But then, although I was unlucky this time, next time, for the fish spawn several times a year, I thought it would work out.

Now to come back to my preliminary statement. It could appear as if it were a fault for aquarists to acquire something new. Not at all! This is the way we guarantee the keeping and breeding of many species, and cichlids, although they are not always 'house-trained', should not be excepted as they form a beautiful inclusion for our aquaria. *A. portalegrensis* are largely annoying 'grubbers' before and during the spawning period, and so their tank must contain only stones and roots on the bottom and no fine plants. The young fish themselves are quite pugnacious but, although the parents protect the eggs and fry diligently, it is not possible to protect the young fish entirely from the adults of the species. My hand, when I put it into the tank to arrange something there, was violently seized and I clearly felt the swollen lips of the fish gripping my skin.

The fish are omnivorous and for a fully adequate diet they must receive some vegetable food.

American Sunfishes

continued from page 267

akee, are sometimes collected in the same area. The latter species is the most colourful of the three.

Mesogonistius chaetodon: black-banded sunfish. A handsome fish common to the area New Jersey to Florida. The adult reaches a size of 2½ inches. Most specimens of this fish have been bred and raised in Europe, as it is illegal to collect wild fish of this species in the U.S.A.

Lepomis macrarchus: the bluegill of the Eastern States, which reaches a size of around 6 inches. A hardy fish that is

cultivated in some U.S. hatcheries as a food fish, where, with the favourable conditions provided, they can reach a pound in weight.

Almost invariably the female is the less colourful fish, but, at breeding times, the roles can be reversed as the male pales and the female intensifies in colour.

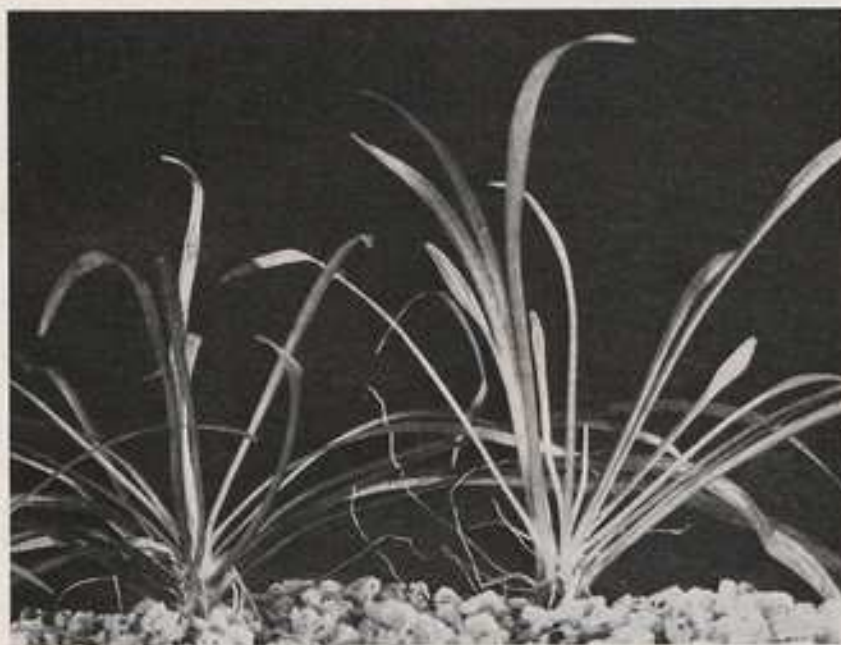
The person who decides to give a home to these fish will find that, apart from colour, they have a number of interesting features, not least of which is their friendly nature to their owner, once they have found that they can trust the hand that feeds them. Give them uncrowded conditions with plenty of live food and they will amply repay the attention shown by showing off with an arrogance that matches the fish-keeper's pride in them.

Small and Large in the 'Swordplants'

By KARL RATAJ

Photographs by RUDOLPH ZUKAL

Echinodorus tenellus



THIS very popular aquarium plant is the smallest of all the species of the 'Amazon swords' (genus *Echinodorus*) and normally reaches a height of only about 1½-2 in. (3-5 cm.), though, rarely, plants might grow to about 4 in. (10 cm.). In good conditions *Echinodorus tenellus* quickly covers the bottom of the tank with a fine, fresh-green growth.

Belonging to the water plantain family, Alismataceae, it can be found in Nature throughout quite a large area — from between the southern states of north America south as far as Paraguay; or, in other words from the edge of the northern temperate zone to the sub-tropical area of the southern hemisphere. Since it is so wide-

ly distributed the form of the plant is very variable but a few varieties have been described by shape, size of leaves and achenes (fruits). The northern variety from the U.S.A. and central America (var. *parvulus*) is only an annual and is not therefore suitable for the aquarium.

Leaves are delicately shaped, very narrow, lanceolate or even linear and with almost no stalk, but the plants growing emerse in Nature (the ones most suitable for the terrarium and the paludarium) do have a leaf divided into stalk and narrow lance-shaped blade. These plants develop a floral stalk, at the end of which there grows one single umbel of several flowers about 3 in. (7.5 cm.) in diameter. Under



Inflorescence of *Echinodorus tenellus*, consisting of several flowers in an 'umbel'

water, as well as on dry land, *E. tenellus* is propagated vegetatively from the root runners.

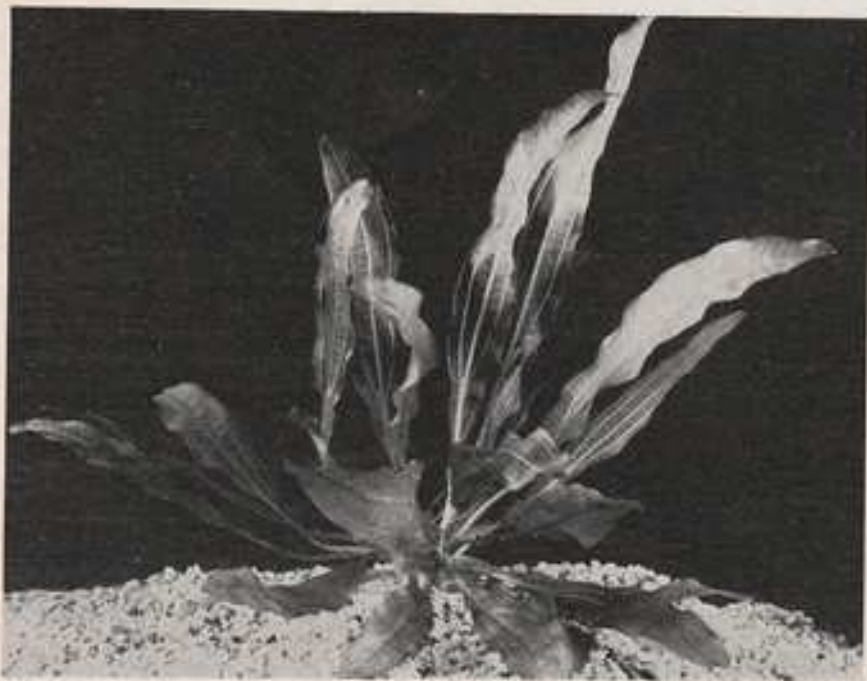
This plant is not at all particular in its requirements for growth. Ideally, a sandy bottom and plenty of light suit it best, with a temperature of about 68°F (20°C) although lower temperatures do not harm it.

Echinodorus horemanii

THIS plant from southern Brazil is undoubtedly the most beautiful new introduction of recent years. It is sometimes offered in the trade by the commercial names *Echinodorus undulatus* hort. or *Echinodorus osiris* 2.

It is a most decorative plant. The submerged leaves are 12-20 in. (30-50 cm.) long, divided into a blade 8-14 in. long and 1-2 in. (2.5 cm.) wide, and the shorter stalk. The blade surface is a dark olive-green colour, very glossy with wavy edges. The veins are lighter in colour with a very pronounced mid-rib at the base of the blade, and since the veins run parallel to the central rib at the base of the leaf it looks as though there are many veins diverging from the base.

The inflorescence is composed of two



Leaves of *Echinodorus horemanii* can reach 20 inches in length

to six whorls each with six to 12 flowers. The flowers are white with 18 stamens. The plant does not form emerse leaves in indoor tanks but in Nature the emersed leaves have stalks longer than the blades, which are oval shaped without transparent lines.

Not unlike *E. uruguayensis* and *E. osiris*, it is differentiated by its green colour and the absence of transparent markings in the blades. From *E. maior* it differs in its darker leaf colour and in having 18 stamens (*E. maior* has only 12 stamens and light yellow-green leaf blades.)

As well as being decorative, *E. horemanii* is most unexacting. It requires clear water, a poor planting medium supplied with detritus is sufficient for its growth, and it can stand any normal aquarium temperatures, from 57 to 81°F (14-27°C). In Nature it does often grow in very cool waters.



White flowers of *Echinodorus horemanii*

MARINIST'S NOTEBOOK

The Marine Butterflies

By ROY PINKS

THE marinist who has achieved some success with the so-called hardier species is inevitably tempted to try his hand with butterfly fishes. The prime characteristic of these fish is their shape, which is generally discoid: some of the most striking and beautiful of all tropical marine aquarium fishes fall within this group, but the penalty is their extreme touchiness as regards water conditions.

There is no escaping the fact that butterfly fishes are short-lived in the home aquarium, and at prevailing prices it is most important to ask the question as to whether we can really afford them. It is not so much that an individual fish is expensive, but that, having failed with one's first specimen, one gets a fearful and

almost irresistible urge to keep buying replacements until success has been achieved. It must be allowed that public and scientific aquaria are able to keep butterfly fishes for reasonable periods (though reliable information on this score continues to elude me!), and if the beginner really sets out to preserve just one or two single specimens using comparable conditioning techniques, the results would probably be a lot more encouraging than they usually prove to be. I would suggest that those with aspirations to keep butterfly fishes should acquire just one of their choice and that they keep with it one or two neon gobies and a cleaner wrasse.

From my own experience, one of the best bets in the way of butterfly fishes is

the moon butterfly (*Chaetodon lunula*). At about £5 for 4 inches, the marinist is quite likely to get a fish which, given good health to start with, and optimum aquarium conditions, will adapt passably. Its main colour is green with yellow overtones. There is a blackish-brown bar through the eye area and just behind the operculum and on the dorsal and anal fin edges. The great beauty of the moon butterfly lies in the texture of its body, which, when a specimen is in really good condition, reminds me of velvet. It is somewhat variable in colour, and individual fish often do not compare in brightness. Some look very green and others look very yellow — this may be dependent on age. At all events, beware of specimens less than 2 inches in length, as rearing young butterfly fishes is considerably more difficult than keeping adults alive.

The moon butterfly is a remarkably active fish and, always assuming that it has settled down well, does not seem particularly fussy about food. It is a rather thick fish (unless out of condition), and this is a characteristic I always like to start with, as it is so much more encouraging than some of the wafer-thin species which, even in perfect health, appear to be in the direst danger of expiry from one minute to the next. Try your moon butterfly on the whole range of foods at your disposal. Earthworms, finely chopped, usually work wonders in the early days (tubifex worms are not always very popular), and it is not long before it seems that these fish were just created to live on dried food and nothing else. I think many aquarists make the mistake of assuming that because a fish will take this form of nourishment, this is all it wants. I certainly do not blame dried foods for marine fish degeneration, but it is probably important to introduce as many living organisms into the diet as is practicable. The moon butterfly tends to snap up

everything at all edible, and in some instances it becomes such a glutton that it gives a false impression that feeding butterfly fishes is so very simple. We all know that it is not, and therefore if you have your moon butterfly doing really nicely, just keep pegging away with the job of getting it to double its size! This is something very few aquarists have ever managed to do.

I have suggested the cleaner wrasse as tank companion. Their colour combination with the green and yellow of the butterfly is a very pleasing one, and their habits do seem to complement the life of the butterfly group — though it seems quite certain that they can easily get along without one another if it really comes to it. The feeding of this combination, too, presents no problems because the leavings of the moon butterfly are readily disposed of by the smaller fish, whose tastes are pretty catholic by general marine standards. I think I should stress that it is wise to introduce lots of brine shrimp from time to time, because the cleaners seem to pick this up very readily and it constitutes a welcome change of diet. Brine shrimp of adult size has a special appeal to the wrasse and the butterfly, and now that there is a special food and technique for culturing brine shrimp, this activity could prove to be of lasting benefit to the fishes as well as an interesting sideline for the aquarist.

I almost forgot to stress that your tank water should be absolutely free of nitrites for these fish. This means taking the tank well past the stage at which damsels will survive in it. Water at about the 6 months stage seems most suitable, but of course a lot depends on what has been in it for that time, and how it has been conditioned. Somebody will produce a computer-generated graph of all this, perhaps, in 2075. In the meantime we have to use our wit and a lot of guesswork.

What's New?

Aquarist's Diary '76

APPEARING at the end of this month for the ninth successive year is the *Aquarist's Pocket-book and Diary*, for 1976. As regular users of this will know,

it is much more than a day by day diary. It has an aquarium and pond data section of useful facts and figures and also has 16 colour pages of world maps. Orders for dispatch immediately upon publication (price 60p, post free, including VAT) to PF Publications, 554 Garratt Lane, London, SW17 6NY.

Japanese Hospital for Sick Fishes

MIE Prefecture, central Japan, sponsors a unique medical institution in Toba City. Situated at the Toba Municipal Aquarium is Japan's only fish hospital, which has daily surgeries open to the public for treatment of sick fishes; the hospital also runs a medical counselling service for pet fishkeepers.

In the mushroom-shaped fish hospital are located a feed preparation room and a treatment room. The latter contains some 20 holding tanks arranged in tiers. The fish hospital was started in 1965 to mark the Toba Aquarium's tenth anniversary. Each day the hospital offers free medical service for fishes and is dealing with between 200 and 300 postal enquiries from all over the world, particularly from America and the Federal German Republic. The fish hospital has a staff of twelve, all members of the thremmatological research station of the aquarium. All the fish doctors, furthermore, are licensed professional divers who are experts in ichthyological diagnosis.

Fish may be hospitalised here e.g. because of pop-eye, or because they are showing the symptoms of white spot, or because of scale loss. Among the special cases are fish unable to maintain their balance because of swelling of their internal organs. Researchers have developed a technique to help the fish regain their sense of balance after treatment by attaching floats to their dorsal fins and weights to their bellies.

Types of treatment offered by the Toba hospital include surgery, injections and the administration of internal medicine. Fish that have been fighting among themselves and become wounded, for instance, are treated with mercurichrome.

To aid in the difficult task of distinguishing between healthy fish and those with internal disorders, at Toba they have devised a diagnosis routine which takes into consideration the way a fish is swim-

By
RAYMOND LAMONT BROWN

ming, the colour of the eyes, their appetites and so on. Vermifuges are administered to fish carrying worm parasites; diastase is given to fish with poor appetites and vitamin shots to fish which are exhausted.

Major operations are also performed at Toba and many new techniques have been developed in the operating theatre. Minor operations are treated in an 'out-patients' department; pop-eye in fish is quite a common occurrence and this is dealt with by releasing the air trapped inside the eye by using an injection syringe.

At the time when the fish hospital was inaugurated, many of the patients brought in were pet tropical fish. *Kingyo* (goldfish), *Kawakamasu* (pike) and *Kinchakudai* (butterflyfish) are the most common patients at the present time. Most of the enquiries from America concern the genera *Holacanthus* and *Pomacanthus* of the marine angelfish family.

Fish about whose diseases the fish doctors are the most frequently consulted are koi (*Cyprinus carpio*). Although a robust fish, koi are susceptible to parasitism and the Toba hospital has special quarantine tanks.

Over the past few years, the hospital has dealt with an increasing number of koi showing the small pimples produced by *Lernaea*, or anchor worms. The affected koi are generally treated by immersion in salt solution. Next comes the parasitic gill fluke, causing irritation and bloody patches on the skin. A short immersion in antiseptic usually takes place for infested koi with a treatment of methylene

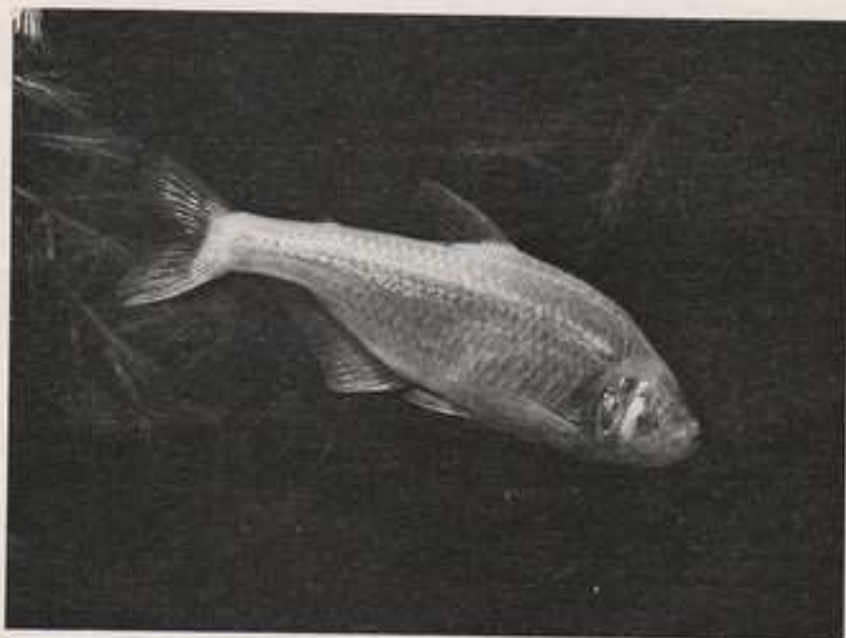
blue. This is also used for curing white spot.

In the main, says the chief doctor at the Toba hospital, most of the fishes who come to us are suffering from nothing more complicated than overeating!

Recently the hospital has been receiving emergency calls from fishery co-operatives

where fish are kept for food production. The fish of this category most frequently found to be sick are *masu* (trout), *maguro-ru* (tuna), *sake masu-ru* (salmon) and *unagi* (Japanese eel). Hotels and restaurants, too, with aquariums for show or for foodstuffs are also frequent consulters.

Blind Cave Characin Spawning



Anoptichthys jordani

THIS interesting species was discovered in the subterranean waters of San Luis Potosi in Mexico and described in 1949. *Anoptichthys jordani*, *A. hubbsi* and *A. antrobius* are derived forms of the species *Astyanax mexicanus* (Filippi 1853), which is found from Texas to Panama. *A. jordani* resembles this species in body shape but has greater depth in the belly region. The fish is a delicate rose colour that gleams silver with increasing age. Fins are colourless or slightly reddish. In good conditions the fish grow to about 3½ inches (9 cm.).

By V. LAHODA

Photograph by the author

The adult and mature fish are blind, with skin growing over the eye sockets and eyes, though the young fish have small, partly functioning eyes that serve them during the first part of their lives. The skin covers the eyes by degrees and then food has to be located by touch and smell. The female is fuller in the belly, the

stronger fish on the whole and more delicately coloured than the male, which is less robust, slim and darker in colour. The young fish carry a rhomboid-shaped fleck at the caudal peduncle, but this disappears with maturity.

To care for this species a large tank is required, with water of DH 10-20 and a temperature 68-75°F (20-24°C). The literature recommends that the tank should be in semi-darkness with a decor combining some small caves in which the fish can hide, but to my mind it is only necessary to keep the tank in semi-darkness during spawning time. The adults swim through the tank bent forward slightly with their heads held downwards in a clumsy way. They are omnivorous, peaceful and will live in community with relatively larger, quiet fish.

It was my ambition to breed this curious species and I tried several methods, none of which succeeded, though I became convinced that I was not going to achieve a spawning by using the accepted procedures. Finally I introduced the pair that I wanted to spawn into a large, plant-

less, tank holding only coarse sand and large stones. There, within an hour, they unexpectedly spawned. It was in fact mid-day, though the tank was shaded from the light and in semi-darkness. The spawning lasted for 2 hours and a considerable number of eggs were laid. As soon as the spawning was finished I removed the parents and darkened the tank completely. At a water temperature of 79°F (26°C) the fry hatched after 48 hours and were free-swimming on the sixth day. It was then that I gave them their first, very fine, fry food. I must add that using such a large tank (68 gallons, 300 litres) gave rise to a lot of difficulties and disadvantages in rearing the fry, although the young fish eat readily and with a plentiful supply of suitable food grow quickly.

That was how, in this unexpected and unusual way, I succeeded in breeding and raising 160 *A. jordani*. After many experiments I am of the opinion that it is no good deciding arbitrarily upon a pair of fish as partners, that a largish tank is required and old, hardish water should be used. Some hiding places must also be supplied for the young.

Book REVIEW

YOUR GARDEN POND by Jack Hems.
32 pages, 13 colour photographs. Colourmaster International, Huntingdon, 1975.
40p.

COLOURMASTER International have scored yet again by putting before the busy reader this excellent potted version of what pondkeeping is all about. There are twelve sections, apart from the introduction, dealing with the siting and construction of the pond, the selection of plants and fish, and the animal life associated with the water garden. The peri-

pherals, including the bog garden and the local environment, are also discussed. The text is unassailable as it stands, but the problem is that when an author has already written a classic it must be tremendously difficult to know what to leave out, and I sense that Jack Hems would have liked to have let his pen enlarge on many of the principal topics, but alas, the constraints were tightly drawn.

The advice is right up to date, and even though this is a miniature, the narrative is highly readable and contains some interesting original notions, all aimed at making the pool beautiful, effective and easy to run. The format is in line with the rest of this series, which means it is easy to read and even easier on the eye, and if the prospective purchaser fails to buy this just on the basis of the idyllic cover photograph of yellow loosestrife in a poolside setting, he must be considered as quite soulless.

I think that more could have been made of the value of ericas and dwarf conifers in the pool environment. They are very much in vogue just now (rightly, I think), and they do not cast their leaves into the pond. Water mint is recommended as a marginal, but is so rampant that it must be tightly confined right from the very start. The introduction of wild fish is severely frowned upon, a little unjustly, I think, but the individual must make up his own mind whether they are admissible or not. I am least happy about the heron countermeasures, which involve wires tightly stretched at strategic positions. The gravest danger is that these might cause children to fall into the pool—there have been numerous tragedies of this kind without the assistance of trip wires—and I really think temporary overall netting is the best answer to this.

ROY PINKS

GUPPY BREEDING

Breeding for Colour

By FRED CAMPBELL

IN guppy-breeding circles it becomes increasingly evident that colour has captured the imagination of most fanciers. Although members of the two U.K. specialist groups are confined to producing specimens with a particular shaped dorsal and caudal to conform to the accepted standards, conversation is almost entirely devoted to colour patterns rather than finnage shapes. In recent years the trend has gained momentum to such an extent that the old -die-hard breeders of the trim and shapely short-tailed varieties are finding it difficult to maintain their stock.

Being one of them myself, the present state of affairs saddens me considerably, but ever conscious of the march of Progress and the consequent change of fashion, I realise the time has come when new addicts to guppy-breeding need to have some understanding of the hereditary principles involved to help them overcome the frustration which can be experienced when breeding for colour.

The many beautiful patterns which the guppy is capable of presenting, the reds, blues, greens, snakeskin etc., are superimposed over a basic body-colour which we will deal with first. In future articles I hope to examine some of the patterns which can enhance them.

Wild Greys

All our modern fancy guppies are, of course, descendants of the wild type which has a body colour of grey. This is determined by a layer of black pigment cells known as melanophores. These have a degree of mobility and, to put it simply, are subject to nervous reaction prompted by the guppy's vision. If, say, the guppy

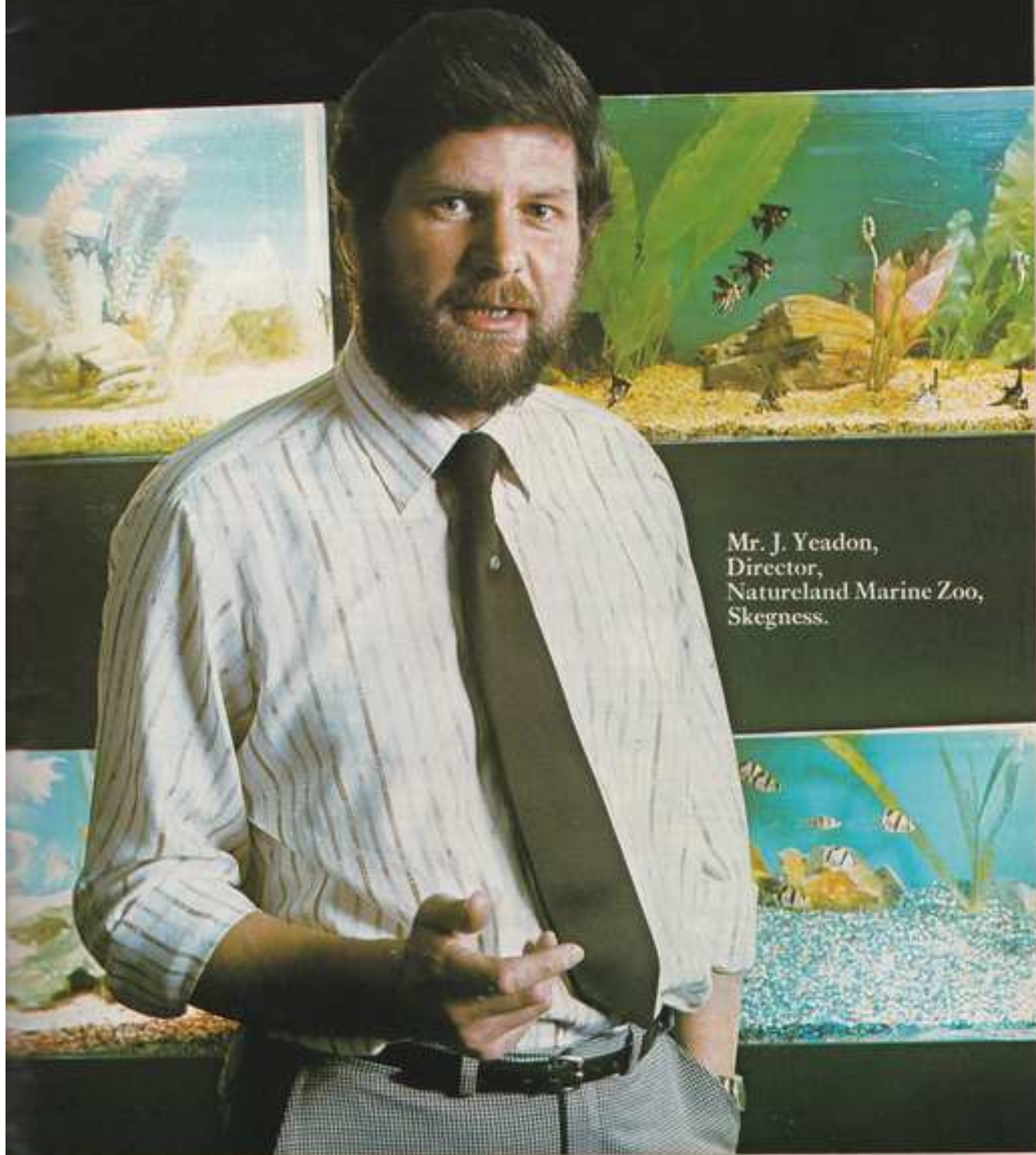
is hovering over a dark background the pigment disperses within each pigment cell, thus giving the skin a darker appearance. Similarly a light background will result in the pigments being concentrated in the centre of each cell and the skin becomes lighter. This explains to some extent the apparent change of shade which occurs in the guppies in our own tanks but there are other factors to take into consideration. Direct sunlight, or a different form of artificial lighting, can produce iridescent colours owing to the influence of reflected light on other pigment cells known as iridophores. Enough of that, however, we don't want to get too complicated.

Colour Mutants

The grey body colour, although variable, is a dominant factor in the genetical make-up of the guppy and, under normal circumstances, will always reassert itself. It is necessary, therefore, to have some idea of what might happen if experimenting with the lighter coloured body types. Over the years mutations have occurred where the black pigment cells have reduced in number, allowing the yellow pigment cells, the xanthophores, to show through in varying degrees of shade. Such mutations have been seized upon and by dint of careful inbreeding basic body colours have been established and given the glamorous names of gold, blond and cream. These are recessive to grey but no difficulty will be experienced in maintaining any particular one of them pro-

Continued on page 281

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Mr. J. Yeadon,
Director,
Natureland Marine Zoo,
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Herr Rudi Barz, 1 Hammannallee, 309 Verden, West Germany.



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John Haynes is the manager of a popular Public House in Leicester. One of the attractions in his pub is a tank of Tropical Fish.

Mr. J. I. Haynes, “The Dove”, Downing Drive, Leicester.

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COLDWATER SCENE

By FRANK W. ORME

Troubles from the hot spell

- **Autumn pond-cleaning**
- **Specialising in a single variety**

JUST to prove that summers of yester-year were not a fantasy, Old Sol excelled himself with his show of prolonged hot bright days, which, despite the farmers' cries of anguish and brown lawns, most people must have revelled in. Unfortunately the high temperatures appeared to cause some deaths to young fish. Perhaps I was fortunate in not suffering in this way. Nevertheless, during June and July I had quite a few telephone calls, from various areas of the country telling sad tales of the problems that were being encountered.

One or two factors seemed common to all. First the young fish went off their food and became listless. In order to revive the fish either a partial or complete water change was given and, within 24 hours, fins turned milky and quickly rotted off. Many fish died despite the application of various remedies, and in some cases the whole season's young were wiped out.

In every instance the aquarist blamed the water. Although additives to the water supply have, on a number of occasions in recent years, resulted in losses to both adult and young fish, this cannot have been entirely to blame this year, otherwise the widespread reports would not have been fairly isolated tragedies, as they were. As I have said — I had no losses, and yet one man was so badly affected that he thought of giving up. The strange thing is — we both use the same water supply; perhaps I was lucky even though I practise regular water changes!

Despite these troubles the pond fish have made good growth and spawned at regular intervals. They spend hours basking in the warmth of the sun, at the water surface, occasionally seeking shade beneath a lily pad when it was too warm for them. Plants have grown profusely, which has aided in preserving the desired water clarity and in turn has held blanket weed in check. Mosquito larvae, in all sizes

from newly hatched to imago, have been abundant. Even the smallest amount of stagnant water seemed to contain a fairly plentiful supply of this excellent live food. With fish house temperatures reaching 100°F plus, and news reports of soaring temperatures breaking records, it has been a summer that will be remembered.



During this month or next, the opportunity should be taken to give a pre-winter clean-up to garden pools. Mainly for the benefit of new readers, I will briefly cover the main points. Having reduced the pond's water level to a depth that eases the job of catching the fish, net the occupants and place them in a suitable container out of the way of accidents. The remaining water can then be removed to silt level. The black bottom silt can be got rid of around the garden flower beds, but before doing so, making absolutely sure that no fish are hiding in the ooze.

Any plants, growing in containers, can be pruned and then hosed before they are also taken out of the pool. It is now fairly easy to trim and generally tidy up the other plants and marginals. Having attended to these jobs to your own satisfaction, hose and if necessary scrub at the same time, to wash any silt or blanket weed from the sides of the pool. Get rid of the dirty water that has collected, give a final swill and again empty. The plants can now be replaced and the pool slowly filled with clean water.

Whilst the water is filling the pool the fish can be inspected for any signs of injury, pest or disease. The chances are that nothing will be found wrong. However, if this is not the case then the appropriate remedy can be applied, before the fish are returned to their clean quarters. Take care to equalise the temperatures before transferring the fish from their

temporary container into the pool.

Personally, I prefer that this major clean-up is undertaken during the autumn. The plants are dying back and the weather is still equable enough to avoid the task being too unpleasant. An over-riding advantage is that the best of conditions will have been provided for the fish to over-winter, and, of course, in the event of a freeze there is less likelihood of trouble from foul water. When the winter has passed, the pool can have a further change of water to ensure perfect conditions for the summer. This may be a 'counsel of perfection' and some may not think it really necessary to go to the trouble of keeping the pool healthy. With a very large pool it may not be necessary but, for the average size garden pool, it is surprising the amount of silt that will accumulate over a period of 6 months, and it is safer to clean it out, if only for the sake of the pool's appearance.

★ ★ ★

This month gives you the opportunity to visit one of the major shows of this country, and, at the same time, give the family a day in London — either shopping or sightseeing. I refer, of course, to The Aquarium Show '75, which is sponsored by this magazine and presented by the Federation of British Aquatic Societies, at the Royal Horticultural Society's Old Hall, in Vincent Square, London, on Friday 24th–Sunday 26th October. The exhibition is in the Victoria area, within easy distance of a number of places of interest, which, if your relatives do not share your interests, will allow them to occupy themselves by visiting the Embankment and the Thames, Westminster Cathedral and Abbey, Tate Gallery, Buckingham Palace, Hyde Park etc., all of which are reasonably close to Victoria. In the meantime you can indulge in meandering around the Show, admiring the fish, marvelling at the ingenuity and inventiveness of those who have designed and built the various Society tableaux that will be on display. The traders' stands will offer much of interest in the way of well-trying and new equipment, foods and sundry other aquatic essentials together with fish, all of which are for sale. There is also the pleasure of meeting and talking with fellow enthusiasts, whilst if you seek an answer to some 'fish' problem, advice can be sought at one of the Society stands.

This Premier Show, which is quite different from the shows I mentioned in my August article, attracts a great many people, some of whom travel a long distance, and it therefore pays to arrive as early as possible, preferably on the Saturday. At whatever time you arrive, however, the effort will be worthwhile, for you are bound to find something of interest and, if you travel as a group, there should be plenty to discuss on the way back home.

★ ★ ★

A short tale of an event that amused me. Recently, whilst I was working in my fish house my wife sent a visitor to see me. He first called at my house during the latter part of last year and I then gave him a couple of small uncoloured lionheads. At that time, he told me, his wife had shown no interest in his single tank of fish. However, the lionheads had grown and changed to gold colour, during which time his wife had become more and more attracted to the pair of fish. Having become converted to goldfish keeping she had persuaded her husband to invest in further tanks and these had been duly installed in the sun lounge extension. The purpose of his visit to me was to obtain further young lionheads to occupy the new tanks.

To my enquiry whether he and his wife had any other types of fish I was told that his wife was not interested in the other varieties of goldfish, although she had seen them in local shows, and tropical fish no longer held any interest for him. The lionhead, I was informed, seemed to have a character totally different from any other fish that he had kept: "It was friendly and amusingly clownish," he said. It seems that when a glass stem thermometer had been floated in their tank the two fish had taken turns at pushing it around the aquarium. Eventually, to avoid the thermometer being broken, it had to be removed. And so the antics of those two fish had won two converts to the hobby — even if it meant the exclusion of all but lionheads. I only hope that the fish which I supplied live up to their expectations and will provide similar amusement for their owners.

★ ★ ★

There is much to be said for keeping only a single variety or species of fish.

In a mixed collection much of a fish's particular charm or beauty is lost. Kept with fish of its own kind the individuals complement each other so that their particular attractions seem to be enhanced. Another point is that, if it is intended to breed, there is no temptation to cross differing types. Of course, few hobbyists are prepared to restrict themselves to a single variety — especially those who are interested in keeping fish only for show purposes. Perhaps I am biased and, no doubt, I shall upset some when I state that I can see no credit in obtaining awards with fish produced by another person. This especially applies to the goldfish varieties. If the fish is difficult or impossible to breed then, of course, it is a totally different matter. But, if you are a collector of fish for showing, do have the tact not to finish an enquiry as one letter that was sent to me ended: it read — "I am not in the least interested in breeding fish. I only require top quality fish for showing, of which I already have a wide selection. I would promise not to enter, or compete against you, at any show in which you enter fish." How he would know which shows to avoid I fail to understand. Even less do I understand why he should think that I would fear his competition. I did supply him with a few fish and suggested that, rather than keep a large 'stable' he should attempt to breed and raise his own stock. It might not be possible to enter as many classes but, surely, more satisfaction would be obtained by gaining cards

with fish that he had produced himself. Still, I suppose, it is our way that some should prefer to raise their own fish, some be interested only in keeping fish as pets and others be like the 'showman' who is interested only in acquiring fish that will gain him awards. Fortunately the bulk of fishkeepers combine a little of all three, which is the pattern with most livestock hobbyists.



A chance remark made some time ago, which was repeated again recently, went something like this: "A club member mentioned your name to me. He said that you contributed articles to a regular feature in a magazine. Is it true?" "Yes," I replied, and this brought the following. "It is about time more was written for the coldwater fishkeeper. I have read most of the fish magazines but do not find them very interesting. Is it a new publication that you write for?" "No," I replied, "the columns appear in *PET FISH MONTHLY*." "But isn't that only for tropical fishkeepers?" Well! Perhaps readers should spread the word to their fellow fishkeepers that this magazine is devoted to all branches of fish-keeping — coldwater, tropical and marine subjects being covered within its pages. Alternatively, perhaps people who are that far out of date should buy a copy of *PFM* before making such statements, and read the contents.

Breeding for Colour

continued from page 278

vided that the two recessive factors are the same in both parents.

To ensure this, care must be taken not to confuse, for instances, blond with gold, for such a cross would probably result in all the offspring being grey. This would be due to them inheriting two dominant factors, the single recessive factor for basic body colour, present in each of the parents, would be restrained. Not to worry though, rear the babies to maturity

and mate them to sister and the F2 brood should contain some gold and some blond and the desired strain can be built up from there.

Although somewhat different from the basic body colours mentioned, the albino cannot be overlooked because of its present undoubted popularity. It is the result of a mutation in which black pigmentation is non-existent, even the eyes appearing pink. In fact the pink eye is a sure indication of true albinism when doubt arises because other colours are superimposed over the basic body colour. The establishment of an albino strain offers no more difficulties than in the case of gold, blond or cream, the same principles applying.



by
ARPEE

Personal COMMENT

In earlier articles we have attempted to set forth the necessary daily and weekly maintenance routines for both fresh- and salt-water aquarium keeping, and we have thus reached the point at which we should consider what tasks should be tackled at the monthly stage. I will repeat that most of the suggested actions will be quickly forgotten unless they are jotted down in a diary or on a calendar or planning aid *which is actually used*. Most of us are wretched diarists at the best of times, and if we only consult these slim volumes two or three times a year for the near-forgotten family anniversaries all of our good intentions will have been in vain.

Tank appearance. Once again this features high on the list. If the earlier operations have been carried out as recommended, the tank should be looking smart enough, but in the case of the fresh-water aquaria, some of the more rampant plants will certainly need attention. Some will need to be shortened back and the ends given or thrown away, but more usually they can be replanted as gap fillers — on the whole, underplanting seems to be an evil of the times. Perhaps the most in-need of thinning will be the floating species: that ever-useful refuge of eggs and tiny fish, riccia, multiplies in a particularly rapid fashion, both in surface coverage and in depth, and it becomes evident that if the tank derives much of its light from overhead, too much of plants like these can cause impoverishment of those in the lower regions.

At the weekly stage I recommended that topping up and siphoning off of sediment should be carried out, though the latter operation need not, at that stage, be particularly searching. At the monthly stage I feel that both freshwater and marine aquaria need rather more than a casual treatment with the dip tube and at this

point I suggest that the tank floor be really thoroughly cleaned. The aim should be to get the end of the tube into every nook and cranny which can be reached without detriment to the orderliness of the layout. Mulm has a habit of collecting in drifts, like blown autumn leaves, and if you know where to look you can achieve a lot with minimum effort. In the case of the marine tank, at least a quarter of the water should be removed and thrown away and replaced by an equal volume of newish salt water. At this servicing point I usually disturb the gravel very vigorously and siphon off the detritus etc. which settles after this upheaval. The corals should be left alone. They become covered with algae in the course of time, and there is little point in trying to remove growths with such tenacious footholds, especially as regrowth invariably follows.

Chemical tests. The marinist is more troubled by variations in the chemical characteristics of water than his fresh-water colleague. There are authorities who advocate daily and weekly checks — nitrite concentration and pH are the most important tests to carry out, but I would normally settle for the latter after the tank has seasoned, as reversions of nitrites are rare. But do read up what corrective action should be taken, as it is useless to know that the pH is wrong if you don't know what to do to correct it. In marine fishkeeping the buffering process is far more important than elsewhere, and strangely enough first-aid pH correction is simple and often very effective indeed.

Air supplies. The state of air-pump diaphragms is a constant nightmare with me, and I make a point of examining them at monthly intervals. It is remarkable how many faults occur with them, and many of them are not visible unless a really close inspection has been carried out. Small slits in the rubber and minor maladjustments make a great deal of difference to the quantity of air delivered, and if they are allowed to develop the consequence may be complete breakdown. In cases of established overcrowding of fishes this will almost certainly result in ill-health or the loss of stock.

Live food. The value of brine shrimp to a very wide range of fishes has always impressed me. It is difficult to assess the precise effect on their well-being, but that they enjoy the occasional feast is quite

beyond dispute, and it is therefore well worthwhile putting down a good quantity of brine shrimp eggs to hatch at about monthly intervals. If you plan your accommodation wisely you can now raise appreciable quantities of adult brine shrimp, too. I tried out some of the Elite Brine Shrimp Food marketed by Hillside Aquatics during the past winter, and the growth rate was all that is claimed. This is a big step forward in live food culture, especially of help to the marinist who is often at his wits' end trying to persuade an expensive fish to take those all-important first mouthfuls in its new surroundings.

General inspection. The monthly stage is a fairly leisurely one, as will now be evident, and the enthusiast will therefore have the time to stand back from his collection somewhat, close one eye and look at it very critically, overall. He should note any features which don't positively appeal and do absolutely nothing about them until the next visual check. Impulse corrections sometimes lead to a worse state of confusion than originally existed, so this is a point on which one can, with complete safety, hasten slowly.



In my notes on colour groups and groups formed by markings, a number of freshwater species which fit into the pattern of fish with vertical bars were considered. These bars are usually black, grey or brownish, and may have been put where they are by Nature in order to enable their wearers to merge easily with the background, on the basis that there are probably more underwater features which are dark in the vertical than in the horizontal plane. If you look at the features in your own tanks you may well agree with me that the lighter accents (the flat leaves of plants, for example) appear more in the horizontal than otherwise. Perhaps, because of this tendency, fish which have bars or lines in this plane seem to have light or luminescent coloration to aid them, in turn, to make the most of their natural surroundings. There are doubtless other good reasons for the marking of animals, but protection is nearly always in the front rank.

The first grouping of 'horizontal' we

may consider is that in which several of the species we have considered earlier in this series also feature. I will not repeat the individual merits of those which have already been discussed, as many of the more popular aquarium fishes will be found in this grouping. The cardinal, the neon, the glowlight, the glowline rasbora, the black neon, the White Cloud Mountain minnow and the Belgian flag are typical of fishes in this category. In some cases, of course, there are darker horizontal lines to complement the highlights, but these seem more to accept them than otherwise.

The second grouping is that in which the darker 'horizontal' seem to dominate, though there are offsetting lighter lines which somehow make the species not altogether inconsistent with the notional camouflage principle noted above. Again the barb family provides a good starter — the cherry barb (*Barbus titteya*) is a smallish fish which does not normally exceed about 2 inches, and its coloration, from silvery fawn to reddish, is extremely attractive in a mixed tank. This species varies very considerably and wild-caught specimens are usually infinitely preferable to those which have been bred in captivity. They do need company, though, as alone they do not carry that much punch — and it is effect we are after in this study. The rasboras provide several horizontally barred species, and one which I always admire is the brilliant or Einthoven's rasbora (*Rasbora einthoveni*). This is rather larger than the run of species which I have discussed — it can reach nearly 4 inches, but it is most elegant in its tan overtones and its general demeanour. Despite its size there is no malice in it, and it can safely be mixed with other species: it would certainly look well with the cherry barb.

If this rasbora is in fact chosen it should be possible to associate with it, without any of the problems resulting from mixing it with timid companions, the black line tetra (*Hyphessobrycon scholzei*). This silvery fish, with its bold black line, is one of the livelier of the medium-sized tetras, and is as hardy as they come. I have always rather shied away from it because it can be a bully and a fin-nipper with small species, and as these are predominant in my collection, I cannot afford to take too many risks. But this fish should go well with this larger rasbora, and it

should constitute a fair-sized shoal for maximum impact.

The pencilfish are one of my favourite groups, but although many species carry horizontal lines, it should be borne in mind that they tend to swim in the upper middle water and are elegant rather than mobile. Some of the more startling species, therefore, are ruled out, but a splendid all-rounder, and comparable in coloration with Einthoven's rasbora, is the very popular *Nannostomus anomalus*, which scarcely ever reaches 2 inches. It is fawny gold with a black bar, and as it ranges further than many of the other pencils, it always seems to me to be much more in evidence than they do. Again, if this fish is included, don't stint on numbers, because if you do, you will lose all the power of the mass of lines which a shoal of such a species will display.

If you have smallish fish in your collection, the baby of the family, the *Nannostomus marginatus*, is an absolute must. This only grows to a bit over an inch. It is golden with black lines and red marks on the fins, and if you put eleven into your water, you have as fine a football team as ever you saw. Of course, when speaking of teams, the ever-familiar zebra

danio (*Brachydanio rerio*) can always be relied upon to comprise the visiting side, though these do not always enjoy the same water conditions. A further word of caution, perhaps. Do not be tempted to introduce the penguin into your tank of 'horizontals'. *Thayeria sanctaemariae* is a fidgety fish, full of unpredictable malice, and I wouldn't give it tank room. Anyway, the line isn't horizontal!

Otocinclus vittatus, or the striped sucking catfish, is another of my favourite species, and although its algae-removing capability is greatly exaggerated, its charms are not. Its line may not always be on the plane in which you want it, but in time I think you would agree that this is not all that important.

The species I have discussed so far should always be introduced in small shoals, otherwise their association becomes meaningless. To conclude, I will suggest that a pair of lace gouramis (*Trichogaster leeri*) might be included for a really regal touch. These are really gorgeous fish when in condition, and they do qualify with not perhaps the most distinctive of lines. But their shape, delicate coloration and sheer class constitute rather more than a mere hint.

Readers' Queries Answered



Mouth Contests

Does mouth-tugging in my severum cichlids indicate that I have a pair?

Mouth-tugging is not, in itself, a definite indication of sexual behaviour. It could equally well occur during a dispute over territory by one male against another. A more helpful indication of sex would be, for instance, the cleaning up of possible spawning sites

by one or both fish. The male is reported to have the more red flecks and the female the shorter fins but it is not always easy to distinguish these when it comes to trying to sex the particular fish in a home tank.

Feeding Fry

I have now lost most of two broods of flame tetra fry. I think I may have been over-

feeding as the tank became sort of 'furred' up. I believe that flame fry are heavy feeders so what quantity of fry food should I be giving them?

It is not possible to specify exact quantities of food but our contributor Arpee has stated that he has obtained excellent results after a spawning of flames by feeding 3 drops of Liquifry dispersed in water and distributed throughout a tank of about 1 gallon capacity three times a day. Microworms should follow, once the fry are capable of taking them, and then Grindal worms or a mash of white worm or tubifex worm.

Cold 'trops.'

Are you able to suggest any kind of sub-tropical freshwater fish that could be kept in tanks at ordinary room temperature but without the use of addi-

tional heaters—either as a community tank or as tanks of individual types of fish? I already keep White Cloud Mountain minnows under these conditions quite successfully.

The suggested fishes that can be kept in unheated tanks are of a rather disparate nature and it would be best to keep them in separate tanks. The paradise fish (*Macropodus opercularis*) grows to about 3½ in., is hardy, easy to feed (it is omnivorous) and the male is colourful if pugnacious (keep one male to two or three females). The pigmy sunfish (*Elassoma evergladesi*) grows to about 1½ in., is rather timid and requires a well-planted tank and small live or frozen foods. These two fishes can withstand really rigorous conditions, though even they prefer an ambient temperature of about 65°F. If you are planning to keep your fishes in a warm living room Australian rainbows (*Melanotaenia nigra*) will live under such conditions (size, about 4 in., omnivorous, prefer hard, slightly alkaline water and require a fair amount of swimming room). Guppies, of course, will live in unheated conditions in a warm room, and another suitable companion for your white clouds might be *Barbus gelius*, the golden barb, about 1½ in. in size.

Grindal Culture

I have been trying to obtain Grindal worms in quantity without much success. They quickly develop a very unpleasant smell. Is it the worms that cause this?

A thriving Grindal worm culture will not smell unpleasant—it is not likely to be the worms causing this but the fact that excess food has turned mouldy. Use oatmeal porridge moistened with tepid water (so that the mixture is damp without there being any excess of water) and provide this in a small quantity only twice a week until the culture is really

healthy; then use it every other day. If the whole culture has gone sour and smells of sulphur and ammonia it would be advisable to start again with a fresh one.

Bacopa

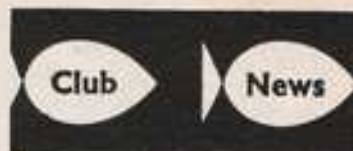
Can I grow *Bacopa monnieri* in a coldwater tank?

Both *Bacopa monnieri* and *Bacopa caroliniana* (*amplexicaulis*) can be grown in coldwater tanks but a certain amount of care must be exercised. In Nature they grow in tropical and sub-tropical areas—of America and of Africa, Asia, Australia and America respectively, so they are not going to grow well in, for instance, a tank in an unheated, unused room, where the water in mid-winter might be very nearly freezing.

Production Capacity

Is it possible to improve the breeding potential of my moon platys, or is the quantity of young restricted to a certain number for each type of fish?

The offspring-producing capacity of a fish does follow a species pattern, to the extent that, for instance, a Cuban limia might produce up to 200 fry whereas 30 blue limia fry would be all that could be expected. However, the range of variation is quite large for individuals. The blue limia, for example, might produce from 10 to 30 fry and with platys broods might range from 20 to 75. There are known factors that can certainly affect the range of fry produced, such as the quality and quantity of food fed before the fish are bred; temperature can also play a part and so can the age of the female fish. The results of the first spawning can be very small. This will increase with the age of the female until a peak is reached—possibly the fourth brood with livebearers—and then a gradual decrease in numbers of fry occurs.



HINCKLEY & DAS held their fourth Open Show at the Westfield Community Centre, Rosemary Way, Hinckley. The benching of exhibits started at 11.30 a.m. and from then to the close at 2.00 p.m. entries were coming steadily in. In all there were 473 entries in the 28 classes, a Society record for Open Show entries. Exhibitors came from as far away as Wales, Kent and many Midland areas. Classes covered both tropical and coldwater fish, and included many unusual and interesting species. Fish were on view from 4.30 and awards were presented at 6.00 p.m. The 1st and 2nd in each Class received a card and trophy, the 3rd and 4th a card. Winners were as follows:

av Guppy: 1, Mr L. A. Humphreys (Corby); 2, Mr C. J. Richards (Sudbury); 3, Mr & Mrs Chambers (Wellingborough). av Molly: 1, Mr L. W. Poole (Banbury); 2, Mr J. T. F. Mayle (Chalmersley); 3, Mr & Mrs Chambers. av Platy: 1, Mr S. T. F. Mayle (Ind); 2, Mr and Mrs Chambers; 3, Mr L. W. Poole (Banbury). av Livebearer: 1, 2 & 3, S.M.I.N. (Nuneaton). Small characin: 1 & 3, Mr C. J. Richards (Sudbury); 2, Mr & Mrs Chambers (Wellingborough). av Characin: 1, Mr R. Phillips (MTA); 2, Mr M. Nightingale; 3, Mr S. T. F. Mayle. Small barbs: 1 & 2, Mr K. Done (Ind); 3, Mr R. Clarke (Ind). av Barbs: 1, Mr J. T. F. Mayle; 2, Mr R. Phillips (MTA); 3, Mr J. Turner (TKAG). Dwarf cichlid: 1, Mr T. Redfern; 2, Mr S. Ward (Banbury); 3, Mr K. Done. Angel fish: 1, G. & M. (Ind); 2, Mr & Mrs Chambers; 3, Mr & Mrs Crew (Wellingborough). av Cichlid: 1, Mr K. Grey (Jones & Shipman); 2, Mr N. Coleman (Wellingborough); 3, Mr R. Phillips (MTA). Siamese fighting fish: 1, Mr C. Pratt (Bedworth); 2, Mr M. Brainbridge (Jones & Shipman); 3, Mr C. J. Richards. av anabantid: 1, Mr R. A. Cleaver; 2, Mr P. Phillips (MTA); 3, G. & M. Corydoras & Brochis catfish: 1 & 2, Mr T. Fuller (Uttoxeter); 3, G. & M. av Catfish: 1, Mr S. T. F. Mayle; 2, Mr J. Goodwill (SASS); 3, Mr M. Nightingale. av loach: 1 & 3, Mr R. Phillips; 2, S.M.I.N. av Egg-laying tooth carp: 1 & 3, Mr G. Stead (TKAG); 2, B. & F. Hurst (Coventry). av Rasbora: 1, Mr E. Sandercock (Goodyers End); 2, Mr M. Nightingale; 3, Mr G. Michelson (Goodyers End). av Danio: 1, Mr E. A. Humphreys (Corby); 2, Miss H. Cox (Nuneaton); 3, Mr S. Bostock. Egg-layer pairs: 1, Mr & Mrs Chamberlain; 2, Mr S. Ward; 3, Mr G. Lindsey. Livebearer pairs: 1 & 2,

S.M.I.N.; 3, Mr T. Redfern. Egglayer broods: 1, Mr & Mrs G. Cox; 2, B. & F. Hurst; 3, Mr & Mrs Crew. Livebearer broods: 1, B. & F. Hurst; 2, Mr J. Turner; 3, Mr M. Brainbridge. *av Tropical*: 1, Mr K. Dome; 2 & 3, Mr M. Nightingale. *av Junior (Tropical)*: 1, Mr R. Dickenson; 2, Miss R. Short (Nuneaton); 3, Mr K. Grey. Single tailed goldfish: 1 & 2, Mr & Mrs Crew; 3, Mr G. Pratt. Twin tailed goldfish: 1, G. & M.; 2, Mr G. Pratt; 3, S.M.I.N. Pond & river fish: 1 & 3, Mr C. Pratt (Bedworth); 2, S.M.I.N.

There were also 13 Annual trophies presented and the winners of these are as follows: Best Fish in Show, Mr K. Grey; Best Angel fish, G. & M.; Best Coldwater, Mr G. Pratt; Best Egg-laying tooth carp, Mr G. Steed; Best Cichlid, Mr K. Grey; Best Anabantid, Mr C. Pratt; Best Characin, Mr C. J. Richards; Livebearer pairs, S.M.I.N.; Best *av barb*, Mr J. T. F. Mayle. Person with the most points, S.M.I.N.; Society with the most points, Nuneaton; Person with the most entries, Mr S. T. F. Mayle; Society with the most entries, Wellingborough.

HORSFORTH & DAS took part in the inter-club show between Aireborough, Swillington and themselves. Results were as follows:

Breeders egg-layers: 1, Mr Seaman (Swillington); 2 & 3, Mr Nichols (Swillington). Breeders livebearers: 1, Mr J. Abbot (Swillington); 2, Mr Hishop (Swillington); 3, Mr P. Smith (Horsforth). Guppies: 1 & 2, Mr & Mrs Hishop; 3, Mr Tiffany (Swillington). Cichlids: 1, Mr O. Stead (Swillington); 2, Mr P. Smith (Horsforth); 3, Mr & Mrs Hishop. Rasboras, carps, danios & minnows: 1, Mr G. Parkin (Swillington); 2, Mr S. Hall (Aireborough); 3, Mr D. Stead (Swillington). Catfish & loach: 1, Mr S. Hall; 2, Mr Tiffany; 3, Mr A. Hardcastle (Horsforth).

Best in Show went to Mr S. Hall from Aireborough. Society points: Swillington, 27; Aireborough, 5; Horsforth, 4.

MR. T. TESTER of **MID-SUSSEX AS** reports as follows on a meeting held 14th August at the Fox and Hounds, Haywards Heath: The chairman, Mr R. Johnson, on opening the meeting, pointed out that there was quite a gathering of aquarists and friends who came from both Mid-Sussex AS and Brighton AS, considering that the meeting was only planned last month. During the even-

ing, those present were entertained by Mr D. Soper (vice-chairman), with a slide show of his recent trip to the equatorial zone of America, which was organised by Mr K. Barraclough of King British. The slide show showed both the fishy side of life in the Amazon and its many tributaries and the way of life of the people in the area. Anyone interested in joining the Club is welcome to attend a meeting as a visitor. Further information may be obtained from the secretary, Mr B. Slade, Sandown, Bolney Road, Anstye, phone Haywards Heath 53747.

THE LOUGHBOROUGH & DAS Open Show was a great success this year, the change of venue being a big help in attracting nearly double last year's entries. With the better facilities the Society hopes to make next year's show even more attractive. Best Fish in Show was awarded to Mr R. Elliott of Corby AS (pencil fish). The Challenge Shield was awarded to Wellingborough for the society with the most points. Remainder of results as follows:

Male Betta splendens: 1, Mr & Mrs Redfern (Hickley); 2, Mr R. Elliott (Corby); 3, Mr C. Brown (Loughborough). *av Anabantids*: 1, G. & M. Allen (Ind); 2, Mr & Mrs Chamberlain (Leamington); 3, Mr R. A. Cleaver (Coventry). Small characins: 1, Mr R. Elliott; 2, S.M.I.N. (Nuneaton); 3, G. & M. Allen. *av Characins*: 1, B. & F. Hirst (Coventry); 2, G. & M. Allen; 3, D. & C. (Northampton). Small cichlids: 1, Mr C. Jackson (Leicester Aquarist); 2, Mr D. W. Harding; 3, Mr D. Smith (Leicester Fishkeepers). Angel fish: 1, Mr C. E. Beaumont (N/A); 2, G. & M. Allen. *av Cichlids*: 1, Mr & Mrs Chambers (Wellingborough); 2, Mr & Mrs Campbell (Corby); 3, Mr R. Neal (Ind). Small barbs: 1, Mr & Mrs Chamberlain; 2, Mr R. Elliott; 3, Mrs D. Cruickshank (Ealing). *av Barbs*: 1, Mrs D. Cruickshank; 2, Mr W. E. Neville (Grantham); 3, Mr & Mrs Chamberlain. Corydoras & Brochis: 1, Mrs D. Cruickshank; 2, Mr D. Green; 3, Mr R. Harlow. *av Catfish*: 1, Mr B. C. Roberts (Solihull); 2, Mr T. A. Cruickshank; 3, Mr & Mrs Campbell. Livebearers. *av Swordtail*: 1 & 3, Mr M. Rowe (Loughborough); 2, Mr & Mrs Chambers. *av Platy*: 1 & 2, Mr L. W. Poole (Banbury); 3, Mr G. D. Lindsey (Loughborough). *av Molly*: 1, Mr & Mrs Chambers; 2, Mr L. W. Poole; 3, Mr & Mrs Crew. *av Guppy*: 1 & 3, Mrs L. Humphreys; 2, Mr & Mrs Crew. *av Livebearer*: 1, Mr A. Onslow; 2 & 3, S.M.I.N. Livebearer pairs: 1, Mrs Humphreys; 2 & 3, S.M.I.N. *av Loach*: 1, Mr W. E. Neville; 2, Mr R. A. Cleaver (Coventry); 3, Mr

S. Elliott. Egg-layer pairs: 1, Mr & Mrs Chamberlain; 2, Mr G. D. Lindsey; 3, Mr R. Neal. *av Rasboras*: 1 & 2, Mr M. J. Nightingale (Tamworth); 3, Mr H. Bostock (Loughborough). *av Danio B WCM*: 1 & 3, Mr R. Elliott; 2, Mr S. Bostock. *av Egg-laying toothcarps*: 1, B. & F. Hirst (Coventry); 2, Mr & Mrs Crew; 3, Mr & Mrs Redfern. Egg-laying broods: 1, Mr & Mrs Crew; 2 & 3, Mr M. Marsden (Corby). Livebearer broods: 1, Mr W. Neville; 2, S.M.I.N.; 3, Mr & Mrs Redfern. *av Tropical*: 1, Mr & Mrs Chamberlain; 2, Mr R. Elliott; 3, Mr C. Jackson (Leicester Aqu).

Coldwater section. *av Single-tail goldfish*: 1 & 3, Mr & Mrs J. R. Amos (Bristol); 2, Mr & Mrs Crew. *av Twin-tail goldfish*: 1, Mr & Mrs J. R. Amos; 2, Mr G. Cattell; 3, G. & M. Allen (Ind). *av Coldwater, pond or river fish*: 1 & 2, S.M.I.N.; 3, Mr D. W. Harding.

HASTINGS & ST LEONARDS AS members very much enjoyed the interesting and instructive talk given by Mr A. Bullock, general secretary of the British Koi Keepers' Society (FBAS). The Society was very pleased to welcome also at this meeting Mrs Sybil Hedges and members of Bexhill AS. An Open Forum, with a quiz by Mrs Adams illustrated by very good drawings of plants and fishes, made another very enjoyable meeting. The table show was judged at this meeting by Mr D. Baker with the following results:

D: 1 & 2, Mrs Adams; 3, Mrs French. E: 1 & 2, Mrs Adams; 3, Mrs French. S: 1 & 2, Mrs Adams. P: 1, Mrs Coleman; 2, Mrs Adams; 3, Mrs French.

THE ASSOCIATION OF MIDLAND GOLDFISH KEEPERS have again had the pleasure of hearing one of the hobby's well known 'names' — Mr L. G. Emery of Bath. A brief history of the Bristol shubunkin was given, followed by a resumé of Mr Emery's early days in the hobby and an outline of how he set about building up and establishing his well-known strain of Bristol shubunkins. Members' questions elicited some interesting replies from which many good tips could be picked up. A vote of thanks given by Mr N. Giles of Leicester spoke in glowing terms of the years devoted to the Bristol shubunkin by Mr Emery and the high quality of his fish, together with the esteem in which he is held by the goldfish hobby.

THE SPALDING & DAC were pleased to welcome Mr E. Allen, former chairman of the British Koi Keepers' Society, at their August meeting. Mr Allen showed slides of koi, his own method of concrete pond construction, filtration and water-changing systems. These were followed by the Japanese scene with views of ponds, bridges, lanterns, filtration and koi spawnings. The advantages of water filtration with such large fish as koi were explained and some discussion on the purchase, quarantine, feeding and care of koi concluded the meeting which was thoroughly enjoyed by all. Arrangements were made for a visit to see the koi ponds of Mr Allen at a later date. Spalding & DAS are very pleased to welcome new members to their meetings which are held on the first Thursday of every month at 7.30 p.m. in Fulney Hall, Spalding. The general secretary is Mrs P. Piggett, 10 Austendyke Road, Weston Hills, Spalding, Lincolnshire, telephone Spalding 4114.

HIGH WYCOMBE AS (FBAS) activities recently have included playing host to Runnymede AS for an eight-a-side match (which the visiting team won by 76½ points to 59½) and to the fifth round of the Three Counties Group fish league, at which results were: joint 1st, Newbury and Basingstoke (39); 2, High Wycombe (27); 3, Reading (22); 4, Bracknell (18). The overall league positions are now: Basingstoke (152), Newbury (149), High Wycombe (133½), Bracknell (110), Reading (100½). Club meetings have also included discussions on fish diseases, the strength of the salt water solution for brine shrimps, snails and Malawi cichlids. Future meetings include: 2nd October, talk; 16th October, eight-a-side match; 30th October, quiz set by secretary Mr J. Bushby; 13th November, talk by Mr Tony Harmsworth on marines. Visitors are welcome and further details can be obtained from Mr Bushby, 3 Hawthorne Walk, Hazlemere, Bucks. Phone Penn 3825.



FEDERATION NEWS

Mr. Dick Mills writes: "Patrons of the FBAS AquaTalks will be pleased to know that, at last, programme nos. 8 and 9 are now fully available; these are, of course, 'Northern Sights' by R. D. Esson and 'The Verdict is Yours' by C. A. T. Brown respectively, and our thanks to Societies who accepted second choices during the rather long production time of these programmes. The list of available programmes has recently been expanded:

- No. 10 Filters by R.C. Mills
- No. 11 The Birth of Aquarian by Dr D. M. Ford
- No. 12*International Aquaria by Dr D. M. Ford
- No. 13*Labyrinths by F. Tomkins
- No. 14*Characins by Gordon Howes

Of these, no. 11 marks a new development in the close association between the FBAS and the aquatic manufacturers. In close collaboration with Pedigree Pet Foods Ltd, the FBAS is pleased to announce a tape/slide programme detailing the

process of development of a new aquatic product, from the original idea to the final full production on commercial scales. Dr Ford has also kindly offered to provide a 'spin-off' AquaTalk dealing with the international aquaria visited by him during research work for the new product. This programme, along with the others above marked with asterisks, is still in the production stage and will be available at a later date.

Further titles are often being suggested by Societies, and an obvious absentee in the list of programmes is one on Livebearers. However, as always, more than the usual platys, swordtails, mollies and guppies is required and photographs of those 'A.O.S.' types are not always easy to come by; if you can help out (or even feel like doing the talking, too!) please get in touch with me, Dick Mills, through the post or in person at The Aquarium Show on the FBAS stand—if I'm not there, I'll be photographing something or other around the Hall!"

Federation Championship Results

Sudbury AS	Ca	Mr T. Burvill (Basingstoke)
Brighton & Southern AS	Cb	Mr P. W. Cottle (N. Kent)
Riverside AS	Cz	Mr M. West (Kingston)
Southampton AS	Db	Mr T. Fraser (Basingstoke)
Corby AS	Dz	Mr M. Strange (Basingstoke)
Redcar AS	Eb	Mr Readman (Hartlepool)
Mid-Kent AS	G	Mrs M. Nethersell (Riverside)
Catfish Association	Ha	Mrs M. Nethersell (Riverside)
Havant AS	Hz	Mr K. Taylor (Havant)
Redhill & Reigate AS	L	Mr K. Groves (Horsham)
Gosport AS	Ma	Mr J. Brown (Croydon)
Medway AS	Mz	Mr C. Elliott (Medway)
South Shields	NC	Mr Holman
North Kent AS	NO-T	Mr K. Usher (Doncaster)
Cardiff AS	Q	Mr K. Usher (Doncaster)
Southend, Leigh & DAS	T	Mr K. Usher (Doncaster)
Corringham AS	XB-M	Mr P. Moya (Sudbury)
Port Talbot AS	V	Mrs C. Rupert (Port Talbot)
Salisbury AS	Y	Mr L. Wilkins (BMAA)

International Guppy Show 1975

AT the 1975 International Guppy Show held by the FANCY GUPPY ASSOCIATION, Mr Ken Lee of Edmonton won the FGA World Guppy Championship (80 points). Mr & Mrs Don Phillimore, also of Edmonton, came second and Mr Lee also won the third place. The Calgary trophy was won by the South London Section with 101 points, (2nd Edmonton Section, 64 points; 3rd, North West Lancs Section, 33 points and 4th, Birmingham Section, 28 points). Mr K. Lee won the Master Breeders trophy with 77 points. Best in Show and Best Female was won by Mr R. Clarke with a roundtail female gaining 72 points; Best Male by Mr A. Charlton with a topword (74 points) and Best Breeders by Mr B. Fowler with a breeders pair, obtaining 75 points. The total number of entries was 345. Results were as follows:

Delta male: entries 25; judge, Mr G. Goodall; 1, Mr & Mrs Grenhaigh (N.W. Lancs, 78); 2, Mr H. Vinall (South London, 74); 3, Mr & Mrs D. Phillimore (Edmonton, 73). Long dorsal veil: entries 18; judge, Mr K. Lee; 1 & 2, Mr B. Fowler (South London, 75); 3, Mr & Mrs D. Phillimore (73). Short dorsal veil: entries 22; judge, Mr D. Gillen; 1, Mr B. Fowler (75); 2, Mr D. Gillen (Manchester, 74); 3, Mrs J. Croft (Birmingham, 72). Fantail: entries 7; judge, Mr D. Gillen; 1, Mr J. Mathews (Birmingham, 74); 2, Mr & Mrs Brock (South London, 72); 3, Mr & Mrs D. Phillimore (68). Top sword: entries 13; judge, Mr G. Goodall; 1 & 2, Mr A. Charlton (Manchester, 74 & 73); 3, Mr & Mrs Purdy (Birmingham, 72). Bottom sword: entries 9; judge, Mr B. Hawkins; 1 & 3, W. & R. Myers (South London, 77 & 72); 2, Mr D. Gillen (73). Double sword: entries 14; judge, Mr D. Phillimore; 1, Mr B. Fowler (74); 2 & 3, Mr K. Lee (73 & 71). Original veil: entries 4; judge, Mr B. Hawkins; 1, Mr B. Fowler (74); 2, Mr & Mrs D. Phillimore (71); 3, Mr B. Beacham, snr. (Birmingham, 70).

Pinstail: entries 2; judge, Mr D. Gillen; 1, Mr R. Clarke (Radlett, 69). Dove-tail: entries 19; judge, Mr B. Hawkins; 1, Mrs Collingbourne (Radlett, 71); 2, Mr B. Beacham, snr. (69); 3, Mrs J. Croft (67). Coter male: entries 12; judge, Mr G. Goodall; 1, 2 & 3, W. & R. Myers (78, 75 & 74). Scarftail: entries 4; judge, Mr K. Lee; no card. Roundtail male: entries 3; judge, Mr D. Phillimore; 1, Mr K. Lee (66). Speartail: entries 1; judge, Mr G. Goodall; 1, Mr R. Clarke (65). Lyre-tail: entries 21; judge, Mr H. Vinall; 1, Mr I. Crankshaw (N.W. Lancs, 72);

2, Mr K. Lee (71); 3, Mr G. Beer (Birmingham, 70). Superba: entries 19; judge, Mr B. Hawkins; 1, Mr D. Gillen (72); 2, Mr J. Mathews (71); 3, Mr B. Beacham, snr. (69). Wedgetail: entries 17; judge, Mr D. Gillen; 1, Mr & Mrs D. Phillimore (74); 2, Mr D. Curry (72); 3, Mr B. Beacham, snr. (71). Natural female: entries 19; judge, Mr D. Phillimore; 1, Mr K. Lee (76); 2 & 3, W. & R. Myers (75 & 72). Scalloped: entries 3; judge, Mr G. Goodall; 1 & 3, W. & R. Myers (72 & 68); 2, Mr & Mrs D. Phillimore (70). Coter female: entries 10; judge, Mr M. Brownings; 1, Mr B. Fowler (75); 2, Mr R. Clarke (73); 3, Mr K. Lee (69). Metropolitan: entries 4; judge, Mr D. Gillen; 1, 2 & 3, Mr D. Tait (Birmingham, 76, 71 & 70). Roundtail: entries 3; judge, Mr G. Goodall; 1 & 3, Mr R. Clarke (72 & 69); 2, Mr B. Fowler (71).

sov female: entries 6; judge, Mr K. Lee; 1, Mr & Mrs D. Phillimore; 2, W. & R. Myers (73); 3, Mr & Mrs D. Mathews (72). sov male: entries 3; no card. Colour male: entries 24; judge, Mr B. Hawkins; 1, Mr K. Haynes (South London, 78); 2, W. & R. Myers (South London, 74); 3, Mr Collingbourne (Radlett, 73). Colour female: entries 9; judge, Mr D. Gillen; 1, Mr J. Crankshaw (73); 2, Mr R. Francis (Birmingham, 74); 3, Mr K. Lee (71). Ladies male: entries 2; judge, Mr D. Phillimore; 1, Mrs D. Tait (72); 2, Mrs D. Mathews (68). Ladies female: entries 1; judge, Mr G. Goodall; 1, Mrs D. Tait (Birmingham, 71). Junior male: entries 5; judge, Mr K. Lee; 1 & 3, Mr I. Mathews (76 & 74); 2, Mr L. Phillimore (Edmonton, 75). Junior female: entries 3; judge, Mr K. Lee; 1, Mr I. Mathews (72); 2, Mr L. Phillimore (71). Breeders males: entries 8; judge, Mr G. Goodall; 1, Mr & Mrs D. Phillimore (75); 2, Mr K. Lee (72); 3, Mr B. Fowler (70). Breeders females: entries 14; judge, Mr H. Vinall; 1, W. & R. Myers (72); 2 & 3, Mr J. Hutchings (N.W. Lancs, 71 & 70). Breeders matched pairs: entries 12; judge, Mr D. Gillen; 1, Mr B. Fowler (75); 2, Mr & Mrs D. Phillimore (72); 3, Mr J. Hutchings (70). Master breeders: entries 4; judge, Mr D. Curry; 1, Mr K. Lee (72); 2, Mr & Mrs D. Phillimore (73); 3, Mr H. Vinall (72). Advanced master breeders: entries 2; judge, Mr D. Phillimore; 1, Mr H. Vinall (73); 2, Mr K. Lee (71). Grade 1 males: entries 1; judge, Mr D. Phillimore; 1, Mr H. Vinall (72). Grade 1: entries 2; judge, Mr K. Lee; 1, Mr & Mrs D. Phillimore (76); 2, Mr B. Fowler (70).

WELL over 400 entries competed for the 21 trophies and 38 small plaques at the Open Show held by HUDDERSFIELD TROPICAL FISH SOCIETY. The show was a great success in attracting not only exhibitors but also a very large number of the general public. Mr Ian Bangham, editor of the Society's bulletin, writes: 'We hope we stimulated the interest of visitors, anyone who is inclined

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towards fishkeeping will be made most welcome at our meetings, held at the Invalid Car Club, Mill Street, Crosland Moor, every other Tuesday from the 26th August'. Trophy winners are the first names in each section, the other winners received small plaques. The Best Fish in Show, and Rift Valley cichlid, was exhibited by Mr & Mrs Fletcher. Results are as follows:

Section A, Livebearers: Mollies: 1, Mr Nickleson (Swillington); 2, Mr Reeve (Eboracrom); 3, Mr Carrick (Scarborough). Guppies: 1, Mr Blundell (Doncaster); 2, Mr D. Robinson (Keighley); 3, Mr J. Scotts (Aireborough). Swordtails: 1, Mr & Mrs Roberts (Doncaster); 2, Mr & Mrs Tyson (South Humberdale); 3, Mr Thorpe (Doncaster). Platys: 1, Mr & Mrs Emerson (Castelford); 2, Mr D. Sugden (Bradford); 3, Mr P. Squirrel (Wythenshawe). sov Livebearer: 1, Mr & Mrs Feasey (Doncaster); 2, Mr & Mrs Richardson (Scarborough); 3, Mr M. Walker (Swillington).

Section B, Characins — large: 1, Mr L. Gatenby (Bradford); 2, Master D. Frisby (Hull); 3, Mr & Mrs Roberts. Small: 1, Mr & Mrs Hopkins (DOAS); 2, Mr G. Smallwood (Huddersfield); 3, Mr & Mrs Stock (Farnworth). Section C, Barbs small: 1, Mr & Mrs Emerson (Castelford); 2, Mr Allen; 3, Mr & Mrs Tyson. Large: 1, Mr R. Jenkinson (Huddersfield); 2, Mr & Mrs Tyson; 3, Mr J. S. Gilpin (Huddersfield). Section D, Damos & rasbora: 1, Mr & Mrs Hopkinson; 2, Mr & Mrs Feasey; 3, Mr R. J. Stephens. Section E, Egg-laying tooth-carp: 1 & 3, Mr & Mrs Richardson (Scarborough); 2, Mr & Mrs Morrissey (Scarborough).

Section F, Cichlids, Rift Valley: 1, Mr & Mrs Fletcher; 2 & 3, Mrs G. Frisby (Hull), Angela; 1, Mr & Mrs D. Galdon (Scunthorpe Museum); 2, Mr Carrick (Scarborough); 3, Mr Thorpe (Doncaster). Section F, Cichlids dwarf: 1, Mr G. Smallwood (Huddersfield); 2, Mr & Mrs Binns (Scunthorpe); 3, Mr Wood (Horseforth). Large: 1, Mr A. Park (Retford); 2, Mr H. Ackroyd (Huddersfield); 3, Mr & Mrs Myatt (Huddersfield). Section G, Anabantids small: 1 & 2, Mr & Mrs Tyson; 3, Mr Carrick. Fighters: 1, Mr Parkin; 2, Mr J. Emerson; 3, Mr & Mrs Riley (Leeds P.O.). sov Anabantids: 1, Mr K. Lencashire (Doncaster); 2, Mr Lawford (Dewsbury); 3, Mr Welsh.

Section H, sov Catfish: 1, Mr Blundell; 2, Mr & Mrs Morrissey (Huddersham); 3, Mr A. D. Farrar (Huddersfield). Corydoras: 1, Mr & Mrs Emerson; 2, Mr Blundell; 3, Mr & Mrs Fletcher. Section I, Loaches: 1, Mr & Mrs Binns (Scunthorpe M); 2, Mr J. Carnforth; 3, Mr & Mrs Fletcher. Section J, Shark & loxes: 1, Mr D. Sugden (Bradford); 2, Mr Wood; 3, Mr Athroue. Section K, sov Tropical: 1, Mr & Mrs Seaby; 2, Mr Mapplebeck (Eboracrom); 3, Mr E. J. Brown (Huddersfield).

Section L, Breeders egg-layers 11 to 20: 1, Mr P. Squirrel; 2, Mr & Mrs Fletcher. Egg-layers 1 to 10: 1, Mr Thorpe; 2, Mr & Mrs Fletcher; 3, Mr Seaver. Livebearers 1 to 10: 1, Mr Abbott (Swillington); 2, Mr Short (Sheaf Valley); 3, Mr J. Gilpin (Huddersfield). Livebearers 11 to 20:

WALTHAMSTOW & DAS announce a lecture with slides to be given by Mr Alan Lawman on 1st November on his 1974 visit to the goldfish breeders of Japan. Venue: Friday Hill House, Simmonds Lane, Chingford, London, E4 at 7.0 p.m. Admission free. Organized by Chingford & DAS (FBAS) and Walthamstow & DAS (FBAS) on behalf of the Essex, North & East London Aquarists' Association. For further information: contact Mr Alan Chandler, 233 Forest Road, Leytonstone, London E11 1LE; phone 01-539 3422. The Society is also holding its Open Show on 16th November at the Mission Grove School, Anneze, Warner Road, Walthamstow, London, E17 (for details see Dates for your Diary).

1. Mr & Mrs Feasey; 2. Mr & Mrs Richardson. Section M, Pairs egg-layers: 1. Mr & Mrs Morrissey; 2. Mr G. Frisby; 3. Mr Thorpe. Pairs livebearers: 1. Mr Steer (Norfolk); 2. Mr C. P. S. Norton; 3. Mr P. Hanson (Wythenshawe).

Section N, ovov. Coldwater: 1. Mr & Mrs Feasey; 2. Mr & Mrs Riley (Leel); 3. Mr D. Frisby (Hull). Section N, Common goldfish: 1. Mr & Mrs North; 2. Mr Short (Sheep Valley); 3. Mr A. Kay. Fancy goldfish: 1. Mr Lawford (Dewsbury); 2. Mr & Mrs Hopkinson; 3. Master D. Frisby. Section O, Juniors: 1. Miss S. McBride (Aireborough); 2. P. Sudden; 3. J. Emmerson. Section P, Ladies: 1. Mrs T. Clayton (Himingham); 2. Mrs V. Hough (Huddersfield); 3. Mrs Emerson. Section O, Furnished jar: Mrs K. McBride (Aireborough).

Section R, ovov. Marins: 1. Mr R. Newsome (Huddersfield, Hopkingsons); 2 & 3. Mr Kistell (Huddersfield, Hopkingsons). Section S, Novelty class: 1. Mr & Mrs Riley; 2. Mr & Mrs Richardson (Scarborough); 3. Mr B. Stansall & Mr Ramsey (Scarborough). Section T, ovov. Novice: 1. Mr Calvert; 2. Mr C. Carrick (Castleford); 3. Mr F. Rayner (Blakeborough).

MR W. T. RYDER reports on the **PORTSMOUTH AS** inter-club show. The show was well supported by the societies in the area, and we hope they had an enjoyable day out. For those who stayed while the fish were being judged by FBAS judges Mr F. Tomkins, Mr R. Esson and Mr J. Wheeler, there were five films (Green Plants, The Kingfisher, The Sea, The Origins of Weather and The Unknown Delta), refreshments and trade stands to pass the time. Winning Society was

Gosport AS with 29 points (2nd, Southampton AS, 16; 3rd, Havant AS, 15; joint 4th, Bracknell AS & Newbury AS, 12 points each). The other societies attending the Show were Basingstoke AS, Kingston AS, Roehampton AS, Petersfield AS, Littlehampton & Bognor AS, Haslemere AS and Pisces AS. Results for the 12 classes were:

B: 1. Gosport; 2. Havant; 3. Roehampton. C: 1. Gosport; 2. Bracknell; 3. Havant. GH: 1. Basingstoke; 2. Southampton; 3. Newbury. D: 1. Gosport; 2. Newbury; 3. Kingston. JK: 1. Southampton; 2. Gosport; 3. Newbury. F: 1. Southampton; 2. Bracknell; 3. Gosport. E: 1. Roehampton; 2. Basingstoke; 3. Havant. O-T: 1. Southampton; 2. Bracknell; 3. Kingston. LM: 1. Havant; 2. Bracknell; 3. Kingston. U: 1. Gosport; 2.

Petersfield; 3. Newbury. V: 1. Basingstoke; 2. Gosport; 3. Portsmouth. W: 1. Gosport; 2. Havant; 3. Haslemere.

'We were asked by a couple of clubs if it would be possible to send them a copy of the judging sheets, as there was not enough time to look at them at the Show; this can be done, but it will cost 5p per class (12 classes 60p) and must be sent for by secretaries of Clubs which took part in the Show, on club headed paper, with a P.O. or cheque made payable to Portsmouth AS, and a large, stamped, addressed envelope to me, Mr W. T. Ryder, 202 Kirby Road, Portsmouth, PO2 0QB'.

Blackpool AS Show Results

THE show secretary of **BLACKPOOL & FYLDE AS**, Mrs O. Barlow, reports that on the hottest day for 22 years they held their Open Show which attracted 470 exhibits. Results were as follows:

Coldwater, Singletail, common goldfish: 1. Mr C. Whitsey (Accrington, 69); 2. Mr B. Dawson (Heywood, 68); 3. Mr & Mrs Wolstenholme (Blackburn, 63). Shubunkins: 1 & 3. Mr & Mrs Wolstenholme (55 & 60); 2. Mr B. Newport (Runcorn, 64). Koi carp: 1. Mr S. Walsh (Accrington, 64); 2. Mr & Mrs Wolstenholme (62); 3. Mr B. Simmons (Blackpool, 60). ov. Coldwater: 1. Mr G. Harvey (Sandgrounders, 75); 2. Mr C. Whitsey (73); 3. Mr D. Harvey (Sandgrounders, 71). av. Twinstail coldwater: 1. Mr & Mrs Wolstenholme (76); 2. Mr C. Whitsey (73); 3. Mr S. Walsh (Accrington, 72).

Livebearers, Swordtails: 1. Mr & Mrs Muckle (Sandgrounders, 77); 2. Miss M. Burton (Blackburn, 78); 3. Mr J. Cornforth (Bradford, 75). Platys: 1 & 3. Mr J. Ridley (Heywood, 75 & 72); 2. Mr A. P. Squirrell (Wythenshawe, 74). Mollies: 1. Master J. Emmerson (Castleford, 75); 2. Mr & Mrs Poulton (Northwich, 74); 3. Mr J. Ridley. Guppies: 1, 2 & 3. Mr & Mrs Poulton (74, 77 & 76). ov. Livebearers: 1. Mr A. Onslow (74); 2. Mr F. Walsh (Blackburn, 73); 3. Mr A. Onslow (Loughborough, 71).

Characins to 3": 1. M. & N. Rimmer (Sandgrounders, 74); 2. Mr & Mrs Stock (Farnworth, 73); 3. Miss S. Goddard (Macclesfield, 71). ov. Characins: 1. Mr J. Ridley (75); 2. P. & H. Batchelor (Lynes, 74); 3. Mrs P. Ridley (71). Small anabantids: 1. Mr D. Carr (Wythenshawe, 69); 2. Mr P. Jones (Wrexham, 68); 3. Mr J. Taylor (Merseyside, 67). Large anabantids: 1. Mr A. Hopwood (Wrexham, 76); 2. Mr C. Norton (73); 3. Mr & Mrs A. Goddard (Macclesfield, 71). Fighters: 1. Master Emmerson (Castleford, 74); 2. Mr J. Taylor (Merseyside, 72); 3. Mr T. Davies (70). Minnows: 1. Mr R. J. Stephens

(Blackburn, 71); 2. P. & H. Batchelor (70); 3. Mrs O. Barlow (69). Danios: 1. Mr P. Wrench (Northwich, 72); 2. Mr P. Walsh (Blackburn, 70); 3. Mrs I. Burton (Blackburn, 69). 1. Mr & Mrs K. Cowley (Middleton, 71); 2. Mr K. Smith (Middleton, 70); 3. Mr A. Onslow (Loughborough, 69). Lemon sharks & loaches: 1. Mr & Mrs Baldwin (Sandgrounders, 76); 2. Mr D. Shaw (71); 3. Mr & Mrs Houghton (70). Barbs to 3": 1. R. & A. Johnson (Hyde, 75); 2. Mrs Emmerson (73); 3. Mr B. Wilson (Merseyside, 71). Barbs over 3": 1. Mr & Mrs Holmes (74); 2. Mr G. Brnd (Sandgrounders, 72); 3. Mr A. Bickerstaffe (Blackburn, 71). Toothcarps: 1 & 2. Mr K. Kryper (Wrexham, 75 & 73); 3. Mr A. Manser (Sandgrounders, 71). Dwarf cichlids: 1. Mr & Mrs Holmes (Castleford, 74); 2. Mrs A. Johnson (Hyde, 71); 3. Miss H. Johnson (Hyde, 70). Angels: 1. Mr A. Manser (Sandgrounders, 76); 2. C. & K. Davies (Northwich, 75); 3. Mr & Mrs Muckle (Sandgrounders, 73). ov. Cichlids: 1. Mr & Mrs Vernon (Ratford, 80); 2. Mr D. Mason (74); 3. Mr J. Ridley (73).

Catfish, Corydoras: 1. Mr & Mrs Baldwin (78); 2. Miss M. Burton (76); 3. Mrs P. A. Taylor (Merseyside, 75). ov. Catfish: 1. P. & H. Batchelor (77); 2. Mr R. Haigh (75); 3. Mr Mulla (74). Loaches: 1. Mr & Mrs Muckle (Sandgrounders, 75); 2. Mr P. Hinchey (74); 3. Mr & Mrs Burton (Blackburn, 73). ov. Tropical not listed: 1. P. & H. Batchelor (75); 2. Mr C. Everson (Sandgrounders, 74); 3. Mr R. Atherton (Grimwood, 71). Marine tropical or native: 1. Mr D. Lightowler (Blackburn, 71); 2. Mr K. Smith (Middleton, 70); 3. Miss Hunt (Ind. 69).

Pairs livebearers: 1. Mr C. Norton (72); 2. M. & M. Poulton (Northwich, 71); 3. Mr C. Everson (68). Pairs egg-layers: 1. Mr A. Oldham (Wythenshawe, 72); 2. Mr S. Barrett (Wythenshawe, 71); 3. Mr & Mrs Muckle (70). Breeders livebearers: 1. Mr G. Bond (Sandgrounders, 72); 2. Mr A. Manser (71); 3. Mr K. Houghton (69). Breeders egg-layers—hard: 1. Mr S. Hooton (Sandgrounders, 75); 2. Mrs O. Barlow (74); 3. Mr A. P. Squirrell (73). Easy: 1 & 2. Mr J. Ridley (Heywood, 73 & 71); 3. Mrs M. Ward (Middleton, 70). av. Livebearers,

Junior class: 1 & 2, M. & M. Rimmer (73 & 72); 3, F. Ridley (71). av Egglayers, Junior class: 1, D. & A. Harvey (Layne, 74); 2, D. Houghton (73); 3, S. A. Taylor (Marsay, 72).

A cichlid, being shown for the first time, and entered by Mr and Mrs Vernon, won the Best Fish in Show award and the class for Best Fish Shown by a Lady was won by Miss M. Burton with a *Corydoras*.

MR L. SANDFIELD, Press Officer of **EALING & DAS** (FBAS) reports: 'Since March we have enjoyed a number of varied activities, including a hen party (fabulous!) and dance and a coach trip to Brighton & Southern AS on the day of their Open Show. Among the more piscatorial activities: two legs of Irvine and Mills Knock Out trophies, and classes H, JX, C, E, F and G, K, L were on the table. The annual Miniature Furnished Aquarium table show was also competed for.

A very good set of slides depicting coral reef fishes were hired from the BMAA and on the following meeting Mr J. Harvey of Harveys Fins and Wings showed us how to set up a successful marine aquarium. The marine interest seems to be growing among a number of members.

Mr G. Howes of the British Museum of Natural History spoke on evolution and variation in fishes with special reference to the explosive variation, mutation and speciation now taking place in the cichlids of the Rift Valley particularly in Lake Malawi. The astounding colour variations in the Malawi species were, he said, signs of much greater changes taking place 'further in', genetically speaking. The question of pre-adaptive variation was discussed and its possibly mutational causes along with the thorny question of which comes first—form or behaviour. He showed us the amazing variation in structure of marine genera and informed us of the very great numbers in which most marines exist. This emphasised the terrific responsibility on the shoulders of mankind, the dominant intelligence on this planet, to see

that these myriad lives continue to exist in perpetuity. An informed, informative and articulate speaker.

The BKA brought their display to us and their team had things to tell us that approached the complexity of Mr Howes' information. Warning: these BKA people prefer difficult questions. They know! Ealing thanks all these people for their enthusiasm and their kindness in coming to us. The other item was a quiz given by the Press Officer who has had the honour to be chosen FBAS delegate for the BMAA for the remainder of the year. The only blot on the proceedings was the unfortunate cancellation of our Open Show, for which our apologies.'

THE Best Fish in the **DORCHESTER & DAS** annual Tropical Fish Show was entered by Mr R. Taylor who also won the Best Tropical Fish award. Mr H. Cornick entered the Best Coldwater Fish and P. Legg won the Best Junior Entry award. Judges Mr D. S. Langdon, Mr R. L. James and Mr R. Matley had 156 fish in 25 classes to consider and results were as follows:

Furnished aquaria: 1, Mrs W. Voss; 2, Mr P. Jefferies. Barbs: 1, Mr & Mrs G. Fox; 2, Mr R. Christopher; 3, Mr P. Jefferies. Characins: 1, Mr & Mrs G. Fox; 2, Mr R. Taylor; 3, Mr A. Billington. H.H. & C.: 1, Mr D. Norman; 2, Mr R. Voss; 3, Mr S. Payne. Cichlids: 1 & 2, Mr R. Taylor; 3, The Darnick family. Angels: 1 & 2, Mr A. Young; 3, Mr H. Cornick. Labyrinths: 1, Mr P. Legg; 2, Mr H. Cornick; 3, Mr R. Davies. Siamese fighters: 1, Mr R. Taylor; 2, Mr R. Voss. Tropical catfish: 1 & 2, Mr R. Taylor; 3, Mr P. Legg. *Corydoras* & *Brochis*: 1 & 3, Mr D. Norman; 2, Mr A. Billington. Rasboras: 1, Mr S. Payne; 2, Mr & Mrs G. Fox; 3, Mr H. Cornick. Danios and minnows: 1, Mr R. Voss; 2, Fox children; 3, Mr M. Angel. Loach: 1 & 2, Mr & Mrs G. Fox; 3, Mr R. Taylor. av Egglayers: 1, Mr I. Christopher; 2 & 3, Mr & Mrs G. Fox. Pairs of fish: 1 & 3, Mr S. Payne; 2, Mr & Mrs G. Fox. Male guppy: 1, Mr P. Legg; 2 & 3, Mr R. Christopher. Swordtails: 1, Mr & Mrs F. Fox; 2, Mr R. Christopher; 3, Mr S. Payne. Platys: 1 & 3, Mr & Mrs G. Fox; 2, Mr C. Hunt. Stollies: 1 & 3, Mr D. Young; 2, Mr R. Voss. av Livebearers: 1, Mr & Mrs Fox. Common goldfish & comets: 1, Mr H. Cornick; 2, Mr R. Christopher. Shubunkins: 1, Mr H. Cornick; 2, Mr & Mrs Fox. av Coldwater: 1, 2 & 3, Mr R. Christopher. Breeders: 1, Mr & Mrs Fox; 2, Mr D. Norman; 3, Mr S. Payne.

In Brief...

... **WHEN SWILLINGTON AS** took part in the first leg of an inter-club show with Horsforth and Aireborough & DAS results were: Swillington 27, Aireborough 5 and Horsforth 4. Results for Swillington: Guppies: 1 & 2, A. & R. Hislop; 3, Mr T. Tiffany. Breeders egglayers: 1, Mr T. Seaman; 2 & 3, Mr S. Nichols. Cichlids: 1, Mr D. Stead; 3, A. & R. Hislop. Breeders livebearers: 1, Mr J. Abbott; 2, Mr P. Hislop. Catfish & loach: 2, Mr T. Tiffany. Rasboras, carps & minnows: 1, Mr J. Parkin; 3, Mr D. Stead.

... A TALK and slide show by Mr J. Bailey on discus received close attention from members of **COVENTRY P & AS**. The raffle, also donated by Mr Bailey, was very popular as the first prize was a camera. Mr T. Sheehy judged the table show. Mr E. Keeble won the very well-supported catfish class and Mr F. Hirst that for livebearer broods. Mr R. Cleaver won both classes for loaches and minnows.

... **TONBRIDGE & DAS** Open Show was a great success with over 680 entries. The best fish in show was an electric eel. The weather was hot, and everyone had a great day.

... A NEW aquarist society called **THE QUEEN OF THE**

THE CATFISH ASSOCIATION OF GREAT BRITAIN would like to welcome all fishkeepers who will be visiting *The Aquarium Show '75*. The Catfish Stand will have on exhibition some of the rarer specimens of catfish and *Corydoras* and the Association will be pleased to see anyone who is interested in these fish. The Association add: "Should you wish to come along for a chat we will be happy to supply further information on membership etc. Just ask any of the representatives in attendance."

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3. Morena buffers the acidity of the water and thus acts as regulator for the correct pH-value.
4. Morena has the characteristic of an exchange compound which partially softens the water.
5. The humic acids contained in Morena also have a bacteriological effect. This prevents various decaying actions which are very dangerous in breeding tanks, particularly during the development of the eggs as well as for the fry.
6. The favourable composition of Morena prevents various parasitic diseases on the skin surface of the fish and is therefore an excellent preventative against pathogenic micro-organisms.
7. Morena also contains important trace elements (amongst others iodine) which are generally not contained in the water in sufficient quantity.
8. Likewise the optimal composition is advantageous to the plant growth.
9. One of the ingredients of Morena is a special hormone compound. This, together with our already renowned "Triebacktiv" provides ideal water conditions for the breeding of tropical fish. Even with problem-fish, good results can be achieved.
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11. The conditions produced by Morena prevent algae from forming. Algae already present within the aquarium is subsequently destroyed.

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MIDLANDS has been formed in the Nottingham area. Meetings are held on the third Friday of each month at 8.00 p.m., upstairs at the Peacock Hotel, Mansfield Road, Nottingham. Visitors will be made very welcome.

... **MR L. GRIFFITHS**, vice-chairman of **GLOUCESTER AS** gave an interesting lecture to some 30 members of the society on coldwater fishkeeping. The club plan a visit to a local aquatic shop in the near future. Mr F. Timmins won 1st, 2nd and 3rd places in the table show.

... A **TABLE** show for pairs of fishes born last year, the main theme of the July meeting of the **GOLDFISH SOCIETY OF GREAT BRITAIN**, attracted a record number of entries. Winners were Mr K. Speaks (bubble eyes) and Mr W. Leach (Bristol shubunkins). While Mr D. Dudley judged the fish, members were invited to question a panel composed of Mr A. Sutton, Mr M. Cluse and Mr K. Speaks.

... **EAST LONDON A & PA** would still like to see more new faces among members; anyone interested in fish breeding or keeping fish, be it in one tank or in a pond, will be made most welcome on the 1st and 3rd Fridays of each month. Meetings are held at Ripple Road School, Ripple Road, Barking (corner of Suffolk Road). Further information from Mr D. Flack: phone Romford 62594.

... A **VERY** good entry for the **WEYMOUTH AS** table show for egglayers aos and sexed pairs classes resulted in the first being won by Mr J. Fitzgerald (2, Mr R. Reeder; 3, Mr T. Dowle) and sexed pairs by Mr J. Manels (2, Mr T. Dowle; 3, Mr J. Brookes). The Society wish to thank Mr R. Christopher of Dorchester for providing an excellent demonstration of furnished aquaria.

... **LINCOLN & DAS** are holding a Bring-and-Buy sale on the 20th October at the Liberal

THE BRITISH KOI KEEPERS' SOCIETY are looking forward to seeing as many members as possible at their popular stand at *The Aquarium Show '75* at the Royal Horticultural Society's Old Hall, Vincent Square, London, SW1 on Friday, Saturday and Sunday 24th-26th October. A meeting, open to everyone interested, will also be held during the Show with interesting talks, slides and discussions at 2.30 p.m. on Sunday 26th October.

Club, St Swithins Square, Lincoln, at 7.45 p.m. The usual 15% will apply.

Dates for Your Diary

4th October. **BRITISH AQUARIST STUDY SOCIETY** AGM & Conference. Zoological Society Headquarters, Regent's Park, London, 2.15 p.m. Symposium on Livebearing Toothcarps. Tickets (£1.25) from Mr A. F. Keens, Highcliffe, Old Hill, Woking, Surrey.

4th October. **EAST LONDON AQUATIC & PONDKEEPERS** Open Breeders Show. Schedules: Mr M. Pearson, 42 Parkway, Ilford.

5th October. **SCUNTHORPE & DAS** Open Show. Details: Mr L. Burr, 6 Saxby Road, Scunthorpe, S. Humberside.

11th-12th October. **BRITISH AQUARISTS' FESTIVAL**. Belle Vue, Manchester.

12th October. **VAUXHALL MOTORS AC** Open Show. Schedules: Mr A. D. Philip, 16 Hollybush Road, Luton.

19th October. **CHELMSFORD AS** Open Show. Broomfield Community Centre, Chelmsford. Schedules: Mr L. R. Fountain, 10 Brograve Close, Galleywood, Chelmsford, Essex.

19th October. **BRITISH CICHLID ASSOCIATION** AGM. The Bay Hotel, Seaburn, Sunderland, 2.00 p.m. Details: Mr I. Sellick, 280 Northridge Way, Hemel Hempstead, Herts, HP1 2AU.

19th October. **MIDLAND AQUARIST LEAGUE** Inter-Society and Part Open Show. Bulkington Parish Hall, Bulkington, nr Nuneaton. Details: Mr F. Underwood, 59 Warwick Road, Kenilworth, CV8 1HN; phone 59280.

24th-26th October. **THE AQUARIUM SHOW '75** at the Royal Horticultural Society's Old Hall, Vincent Square, London SW1. Presented by the Federation of British Aquatic Societies. Aquarium society fishkeeping exhibits invited. Details from the organiser, PFM, 554 Garratt Lane, London SW17 0NY; phone 01-947 2805.

26th October. **BKKS** AGM. RHS Hall, Vincent Square, London, SW1.

26th October. **DONCASTER & DAS** Open Show. Broadworth Miners Welfare Hall, Welfare Road, Woodlands, nr. Doncaster. Schedules: Mr A. Feasey, 20 Hills Close, Spenborough, Doncaster, DN5 7NW, South Yorks.

28th October. **BRITISH MARINE AQUARISTS' ASSOCIATION** AGM.

... **AMERSHAM & DAS** meetings: 15th October, 8.0 p.m., Amersham Community Centre, Mr I. Sellick will speak on 'Coloration and Communication in Fish'; 5th November, Group discussion. All visitors welcome. Amersham report many successful activities including a judging competition, a Bring-and-Buy sale, away matches against High Wycombe and Aylesbury, and many visiting speakers. The Society were congratulated on their stand at the Amersham Community Centre Exhibition and a car rally and participation in the Amersham Round Table fete completed the summer season.

Lecture Room, RHS New Hall, Vincent Square, London, SW1, 2.0 p.m. Details: Mr D. Highfield, 119 Kent Road, Wood's Est., Wednesbury, SW10 0SN.

1st November. **ESSEX, NORTH & EAST LONDON AA** Lecture. Mr A. Lewman: 1974 visit to goldfish breeders of Japan, Friday Hill House, Simmonds Lane, Chingford, E4, 7.0 p.m., admission free. Details: Mr A. Chandler, 233 Forest Road, Leytonstone, London, E11 1LE (phone: 01-539 3422).

2nd November. **BLACKBURN AQUARIST WATERLIFE SOCIETY** Open Show. Windsor Hall, Blackburn. Details: Mr T. Burton, 21 Henry Street, Rishton, nr. Blackburn, BB1 4JJ.

9th November. **GLOSSOP AS** Open Show. Adult Education Centre, Talbot Street, Glossop, Derbyshire. Details: Mr S. Turner, 58 Anand Street, Glossop; phone Glossop 4409.

9th November. **HALIFAX AS** Open Show. Forest Cottage Community Centre, Cousin Lane, Ilkley, Halifax. Schedules: Mr D. Shields, Cobblestones, Gainest, King Cross, Halifax; phone Halifax 60116.

16th November. **BRADFORD & DAS** Open Show. East Bowling Unity Club, Leicester Street, Bradford 4. Schedules: Mr D. Suggen, 18 Southmere Crescent, Great Horton, Bradford 7.

16th November. **WALTHAM & DAS (FBA5)** Open Show. Mission Grove School Annex, Warner Road, Walthamstow, London, E17. Open to public, 3.0 p.m. Details: Mr A. Chandler, 233 Forest Road, Leytonstone, E11 1LE (phone: 01-539 3422).

22nd Nov. **GOLDFISH SOCIETY OF GREAT BRITAIN** Meeting. Conway Hall, Red Lion Square, Holborn, London, WC1, 2.00 p.m.

22nd November. **FUR, FEATHER & AQUARIA SHOW**. King's Hall, 39 Lower Clapton Road, London, E5. Schedules: Mrs S. Hedges, Koi Corner, 150 Ashburton Avenue, Seven Kings, Ilford, Essex. IG3 9EL; phone 01-590 3239.

30th November. **HORSFORD AS** Open Show. New Civic Hall, Bradford Road, Stanningley, nr. Pudsey, Yorks. Details: Mr C. Coms, 15 Thornleigh Grove, Leeds, LS9 8QR.

6th December. **FBA5** Annual General Meeting, 2.30 p.m., Conway Hall, Red Lion Square, Holborn, London, WC1.

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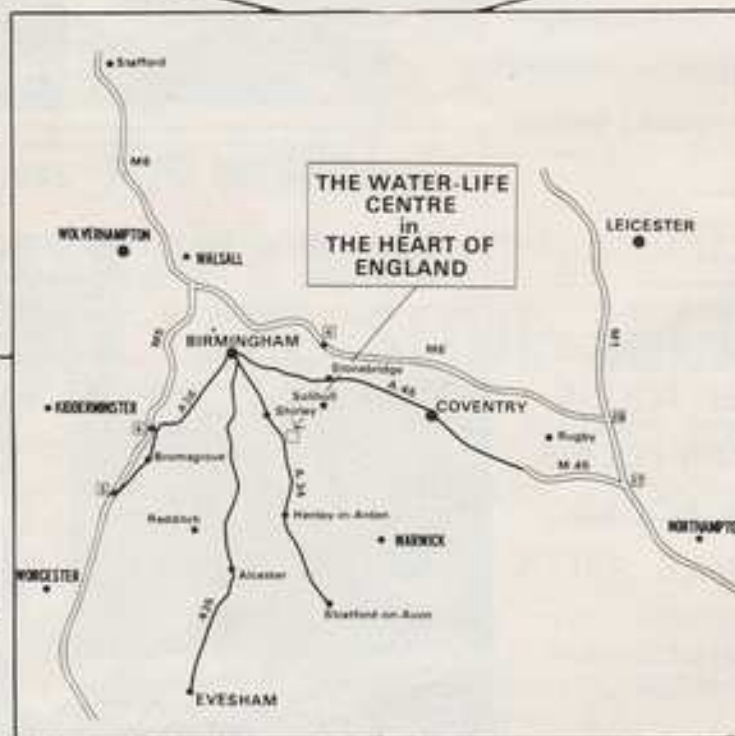
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