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Comments and Quotes

- Fish house torture chambers
- The Aquarium Show '71
- After the strike

Troublesome Vapours

A PROBLEM that commonly arises for owners of fish houses and fish rooms is that of condensation. It is of course hardly avoidable all of the time in some degree or other in an enclosed small area having several hundred gallons of water at temperatures often 30 or more degrees (F) above the outside air temperature. Working in conditions favouring excessive condensation is highly unpleasant (after all, torturers have been known to use overhead drips in the exercise of their art), yet in so many cases considerable improvement results from simple remedies such as provision of covers for tanks and creation of a moderate degree of ventilation and air movement. However, what really reminded us of this problem for fishkeepers was the publication of a report by the Greater London Council that revealed just how much of a headache condensation represents for builders and just how costly can be the cure even under what might appear to be the dry conditions of a modern block of flats. The GLC was spending £50,000 last winter in overcoming wet ceilings, floors and walls in its properties. At first we had a guilty feeling that a massive increase in fishkeeping by flat-dwellers had been responsible but it seems that propagandists for the hobby need not fear prosecution. It is said that an average family can produce about 21 pints of water vapour at home in 24 hours, and the creation of draught-free buildings, provision of ready supplies of hot water, use of paraffin heaters as well as the advent of modern building materials and methods are among factors causing an increase in the complaints about 'damp'. Not only London but housing authorities throughout the nation are apparently having to look for ways to beat the mists within.

Perhaps some fishkeepers who have become experts in coping with this will be able to offer advice.

The Aquarium Show '71

THIS year's AQUARIUM SHOW in London will open to the public on Friday, 29th October and close on Sunday, 31st October, the duration of the SHOW being one day less than last year. Plans are already well advanced for another fine display and we have been hearing from societies who have started work on their Tableaux. Restrictions on maximum and minimum sizes of tanks displayed on Society Tableaux have been lifted this year in response to requests for greater flexibility in the rules. Schedules for this section of the Show will be available shortly and as usual PFM would be glad to have notification from entering societies as early as possible.

Post Script

THE postal strike caused mailings of our February and March issues to subscribers to be delayed. Readers overseas who might be unaware of the reason for the lateness of receipt of their copies of these issues of PFM are assured that the circumstances were entirely beyond our control. With all hands on deck to deliver bulk supplies of PFM we managed to distribute most of our copies to retailers and we trust that not too many readers were disappointed over obtaining copies. Readers' letters continued to reach us during the strike in various ways (some published this month were telephoned, as were some of the items of Club News). Reports from societies in this issue are fewer than usual but we hope to be back to normal next month.



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

Guppy Colour Classes

MAY I add my comments to the controversy as to whether the specialist guppy groups in this country should follow the example of the Americans and subdivide their classes for broad-tails according to colour? (Peter Urwin, *Guppy World*, PFM, January; and Malcolm Delingpole, *Letters*, PFM, February).

I cannot wholly agree with Malcolm in thinking that the demand for reds, blues, greens, cobras etc. is sufficient indication of a demand for separate classes. These demands, as he says, are invariably made by beginners, and George Goodall (who is one of this country's foremost breeders as well as being the F.G.A. stock controller) will confirm this; and he will also confirm that the production and maintenance of a strain of cobras is not difficult. Is it not reasonable to assume, then, that the production and maintenance of any strain based on colour will be relatively easier than producing and maintaining a strain based on shape, particularly the short-tailed varieties?

The tremendous popularity of the broad-tails was emphasised last year when one particular class attracted 90 entries, and in a situation like this I agree that subdivision would be an advantage. To make it a general rule, however, seems to me like taking the easy way out and savours of making a standard to suit the fish rather than of improving the fish to match the standard aimed at.

Bury, Lancs.

FRED CAMPBELL

Identification Please

I WONDER if any of your readers could give me some information on a fish called 'silver link'? It comes from Malaya and is approximately 7½ inches long by 2 inches deep. Scale count: lateral line 36; dorsal to ventral 22. The rays in all fins are soft branched. The last three in the dorsal are elongated and hang just over the lateral line, which is straight. The eye is very large (about the size of a sixpence). The bottom lip is pronounced and opens downwards. The scales are large and silver in colour. Fins are grey to black; belly is white.

Liverpool 16

D. CHARLTON

Show the Rules!

MY job as a representative takes me all over the British Isles and resulted (last year) in my having the pleasure of visiting many aquarium society shows.

That pleasure was on some occasions spoilt by the petty-mindedness of many of the exhibitors voicing their complaints—rarely, I noticed, to a responsible official. Many of their complaints would I'm sure, on investigation, prove that the exhibitor was totally unaware of the show rules and regulations in force at that show.

By putting his fish on the bench and paying the appropriate entry fee a prospective exhibitor automatically indicates that he has accepted a contract to abide by the conditions specified by the organising body. That the club accept his fish binds this contract that they in turn will see that those regulations are adhered to.

Would it not be possible for societies to state quite clearly at the time of benching under whose rules they are staging the show? I realise they usually print this on the show schedules advertising the event but owing to these documents never getting further than the club secretary it doesn't help the individual exhibitor. Bingo halls and other gambling establishments have publicly to display their rules for participating members to see—why not fish clubs?

Dagenham, Essex

L. HOWELL

Water Plants and Algae

MAY I say how much I enjoyed the article by Ron Forder (PFM, February) on algae and how helpful it has been. Algae growth seems to me to strike like some mysterious visitation, inexplicable and incurable, particularly when one tank only of a pair is covered with the stuff while the tank next door remains quite free. R. Forder's explanations of how algae spores abound are very encouraging as they give lots of leads to action to take to get rid of this pest. As there are so many ways of encouraging algae I don't feel discouraged because one tank has unwanted algae—I feel relieved that they are not all infested.

One thing did surprise me, however. Mr Forder states that '... aquarium plants are unsusited by light from any source other than over them. . . . One of the chief offenders under this heading can be early morning sunlight. . . . I thought some plants did well in natural sunlight and I have noticed that *Cabomba* and *Ludwigia* seem to grow particularly well in the tank where some sunlight strikes the front glass during the day.

Morecombe, Lancs.

R. PARSONS

Show Jars

IN February's Comments and Quotes, under the title 'A Showing Problem', there appeared an article on show jars. As the F.B.A.S. was mentioned I would like to make our position clear. The Federation of British Aquatic Societies has never approved of show jars as such. The rule on show containers reads thus: 'Rule 4. All exhibits shall be shown in containers having a flat front, equal at least to the total length of the exhibit; the front will be

Continued on page 501

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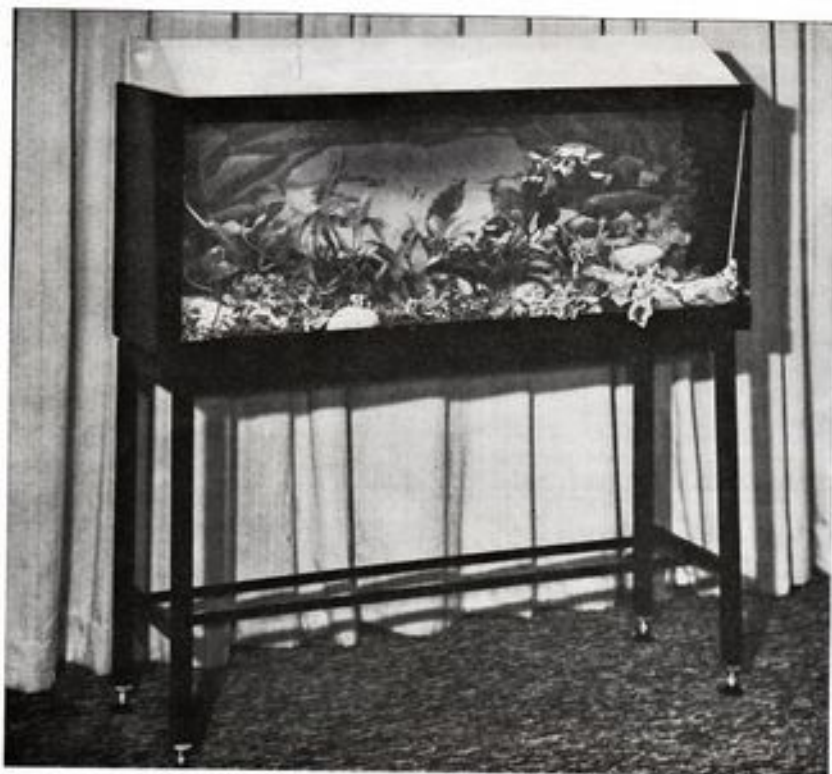
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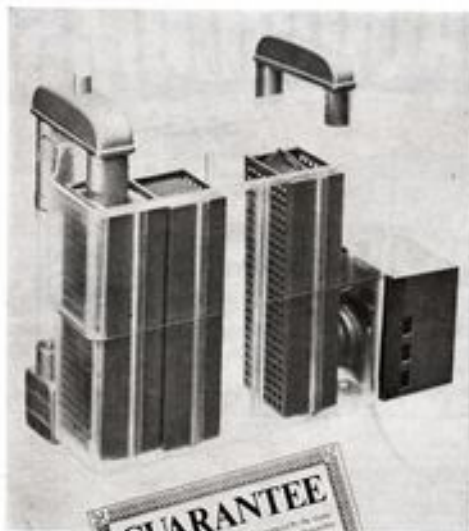
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LETTERS

continued from page 494

taken to be the largest flat viewing area. Containers will have all elevated surfaces transparent. The base may be either transparent or painted black. The minimum size of a container will be 4 in. by 4 in. or 100 mm by 100 mm, except for standard guppy show jars, which will be accepted for inclusion in guppy classes only'.

As can be seen, some slab-sided jars fall into the requirements. The 7lb. sweet jars do not. Broadly speaking the attitude of the Federation is that the exhibit must be shown so that no distortion takes place, and so that if the exhibit is a fish it can turn around in the container with ease. The show tank has not been bettered for this purpose and jars are accepted as a matter of convenience. It may be true that some societies are having difficulty in obtaining the 4lb. sweet jar, and this can be overcome by making up show tanks from glass using one of the many

silicone sealers available today. Federation societies can obtain their jars through the organisation.

R. D. EBBON
Chairman, Federation of British
Aquatic Societies

The Capital's Show

AS an ex-Londoner now domiciled in the north I would like to reply to the letter written by Mr M. Furniss (FYM, February). Has he forgotten that those of us that lived in the capital were without a major aquarium show for nearly two decades? That The AQUARIUM SHOW has been staged successfully for the last 3 years is to the credit of all concerned. Why shouldn't FYM discriminate this event from all the others by putting it in capital letters? If Mr Furniss would study those Underground posters a little closer he would realise that emphasis is part and parcel of modern advertising. I should know because I have worked in it for the past 20 years.

Failsworth, Lancs.

WILLIAM C. DALE

Very true Mr Dale! The registered title of the only aquarium and fish exhibition held annually in central London is The AQUARIUM SHOW, and the capitals are intended to distinguish between use of this title and use of the words in any other way.—EDITOR.

Transatlantic TOPICS

IT isn't often we read of something going down in price, especially in our hobby, so it was gratifying to see C. Wonderlin's letter (FYM, February), that gold angels are now reduced to about £1.10. Perhaps the name of his hometown, Normal, Illinois, had something to do with it?

The original developer of these new angels was Carl Naja, but this intrepid breeder has many other strings to his bow that many have not heard about. Growing up in Milwaukee, Carl was fascinated with tropical fishes from an early age and when many of his age were occupied with other attractions he opened a retail aquatic store. It did so well that he also added a wholesale business.

Apart from the gold variety of *Parophthalmus*, he bred a black variety long before the more familiar Ludwig black, and like his Lake Michigan neighbour, Harry Matson, produced discus by the thousand.

Recently he has been hard at work on the fighting fish, *Betta splendens*. If past records are anything to go by it won't be long before we are reading about yet another new variety from the Naja stable. This aquarist wizard from Wisconsin makes it all look as

By JIM KELLY

easy as stepping from the shadows into the sunlight. Perhaps there is some magic in the waters of Lake Michigan after all!

* * *

Having just received my current telephone bill I am having my first doubts about the wisdom of free speech! But that apparatus born from the brainwaves of Scots-American A. G. Bell certainly can have unique value, as was demonstrated to me by a Chicago aquarium society.

Most clubs throughout the world have been faced with the problem of last-minute changes to their programme or *versus*, alterations that always seem to occur at the eleventh hour when it is too late to inform the membership via the postal services.

This society had foreseen this event and had requested that every member lodged a telephone number with the club secretary. Even those who

didn't boast a phone of their own (a rarity in the States) can usually supply some source who could take a message.

With the recent postal strike still fresh in mind, I am now wishing that I had written this sooner.

* * *

In Las Vegas there are folk who (contrary to the popular British conception) don't spend most of their time gambling. That oasis in the Nevada desert boasts many citizens who prefer fishes to fruit machines—the members of the Nevada A.S.

Along with the local Fish and Game Commission they are actively engaged in trying to save some of the local fish species, especially where conditions have become unsuitable for the fish.

In most danger was the Parump killifish, *Emperichthys lateris*, as the only spring in which it was to be found was in danger of drying up. To prevent the loss of this killie the N.F.G.C. transplanted some 500 adult fish and fry from Ash Meadows to Lake Mojave Spring, in the Lake Mead recreation area.

Because of the turbidity of the water, initial investigation was difficult but recent tests have shown the fish to be settling down and flourishing, getting fat on the unlimited

menu of mayfly, dragon fly and mosquito larvae.

A sub-species of the Parump killie, *E. lates merriami*, has already become extinct.

Probably the best known fish from this region, if only from the publicity it receives in the Press, is the tiny cyprinodont, *Diabolis*, better known to the world of journalism as the Devil's Hole pupfish. These creatures live on subterranean shelves in this famous tourist attraction—a water hole some 30 feet long by 10 feet wide. Depth is estimated at about 300 feet.

* * *

As I have never preached a sermon in my life any reader who can squeeze a moral out of this monastically objective report does so without my permission.

On the other side of the Atlantic club magazines continue to bubble with the enthusiasm of an amateur at the game. It's just about the only connection many have with amateurism in their pages. Sometimes some of the contents are as predictable and meaningless as a sprig of plastic holly at Xmas, but in the main they contain pure gold for the practical fishkeeper.

Take the numerous 'Breeder's Reports'. Members are requested to

write up their experiences on how they fared with such-and-such species and, though many of these accounts are contrary to the 'book', they are the 'practical' events as they happened and thus more important to the hobbyist.

Take Dr John P. Tagett describing how he bred *Pelmatochromis amargii*. Those who are familiar with the traditional method will find much that isn't, in the way he did it. Keeping the fish in soft, acid water, he found his pair of fish anything but shy. Expecting them to 'hang' their eggs, imagine the surprise he got when the breeding pair staked out a portion of the tank's sandy bottom to deposit their eggs on.

Again confounding current ideas, he neglected to remove the male and the fry grew to be nearly an inch in length without father making any attempt to cannibalise his offspring. When the fry were free-swimming both parents became very protective, attacking anything brought near to the aquarium, even the doctor's fingers at feeding time.

The final difference from the traditional referred to the brilliant white cluster of scales found on the female. Supposedly only found around the genital pore during the breeding process, our Michigan breeder reported that he has females

displaying these characteristics in a crowded, bare, 25 gallon set-up containing about thirty assorted kinds of young cichlids!

* * *

Marine fishkeepers ever anxious to avoid contact with metals in their saltwater set-ups will be interested to hear that the magnets used in the new Dynaflo Filter (manufactured by Metaframe) are true non-metal ceramic.

Other improvements to their pump include a more powerful impeller and a motor that is housed in a non-breakable, heat-resistant Cycloc plastic. This motor consumes only 10-8 watts of electricity and generates very little heat. A fact that must surely add up to a longer life.

* * *

Apparently it isn't only the specialist guppy and cichlid breeders that are adding to the list of show classes: the Greater Iowa A.S. included a new class in their annual show for the double tail betta.

I wonder how long it will be before we see this new addition to the fighter classes on our British benches and hear the judges discussing whether it is a case of 'split fins' or not!

Make a Note of It!

By ROY PINKS

A SUBJECT that seldom fails to evoke interest when aquarists are gathered together is how long fishes may be expected to live. Although many thousands perish each year through ignorance on the part of their keepers (usually the inexperienced ones), these are greatly outnumbered by those which are looked after properly, and the average fishkeeper is vitally interested in the likely prospects under such conditions.

I have often sat down intending to write some notes on this very subject, but failure to document my purchases adequately makes it impossible for me to quote reliable data—the human memory is quite untrustworthy over matters like these, as with the weight and length of a fish extracted from the water by

rod and line! It is not that I am particularly unmethodical when it comes to noting what has or has not happened in my aquarium-keeping, but it so happens that I failed to set up a convenient and flexible recording system for this purpose.

For some years past I have maintained a diary (it is in 5-year form) covering both my gardening and fishkeeping activities. This simply records temperatures, wind, purchases, successes and failures etc. It is amazing to note how often history repeats itself! Since data about the lives of individual fish cannot usually be accommodated in the space available in a diary—and certainly it would be difficult readily

to isolate the particular piece of information you were seeking, it is much more satisfactory to card-index your information in alphabetical form, species by species.

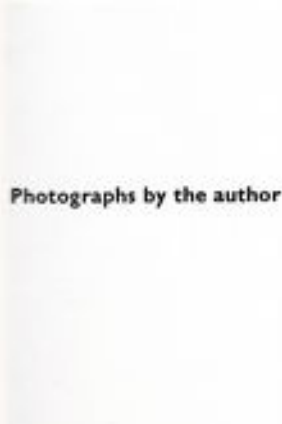
Card boxes, lettered divider cards and lined data cards can be obtained at any stationer for 10 shillings or so. You can use them in any way you like—for the sake of economy I recommend pencil rather than ink entries—and they can be extended or cross-referenced to other sets very readily. The dark evenings often tax us beyond measure when it comes to finding something productive to do, and I suggest a card index of your fishes as being a simple but valuable way of passing a few hours during the bleak (but possibly restful) months of the winter.

Breeding the Opaline or Cosby Gourami



Trichogaster trichopterus sumatranus var. Cosby

By RUDOLPH ZUKAL



Photographs by the author

THIS month our picture series features a very beautiful gourami variety, bred by the American breeder, Cosby, and called after him. It is also called the opaline gourami in Britain. It is a colour variation of the blue gourami, which was brought to Europe from its home on the island of Sumatra in the Indian Ocean. According to Dr Werner Ladiges, the blue gourami is itself a sub-species (*sumatranus*) of *Trichogaster trichopterus*, the three-spot gourami.

And now for a description of this fish's home waters. Sumatra is the largest of the Indonesian group of islands that are part of the Malay peninsular and of the larger Sunda group including Borneo, Java and the Celebes, and the equator passes almost through the middle of it. The south western side and southern limits of the island are bordered by high mountain ranges, but the north eastern part is open and flat, covered with thick forest and swampland and is very wet. This jungle and swampland stretches deep into the island and covers a third of its surface area.

The impenetrable tropical jungle climbs halfway up the mountain heights and is not unlike the tropical jungles of Africa and South America. In the heights, say at a height of about 750 metres, the temperature is in the range 68-80°F (20-27°C) and it is even higher on the plain. There are many short rivers, all flowing in a north-easterly direction through the enormous swamp land and during the monsoons the rivers widen enormously. The rainfall is heavy throughout the year but during the monsoons it is excessive.

Translation by F. MARSH



Picture on page 503: Poised beneath the bubble nest made in a floating tangle of bladderwort, the pair of opaline gouramis are about to spawn. The male is considerably darker in hue than the female. Left, at the start of spawning the male wraps himself completely around the female's body. His snout is seen to be just about touching the tip of his own tail fin. The female makes no movement at this stage.

The river water is predominantly soft, slightly acid, about pH 6. The rivers and streams flow mainly in the southern part of the island through the easily decomposed soil and mountain masses. Their waters are coloured yellow or brown with the tiny particles of earth and sludge suspended in them and are naturally very turbid. Opaque water, of course, lets very little light through and the rich tropical vegetation that forms a thick roof of plants over the water surface also plays its part in cutting down the light, so that the conditions are very poor for the growth of water plants. On the other hand the open swamp land and bogs receive plenty of light and are rich in plant life, many species being

found here that we grow in our aquaria—the floating *Ceratopteris thalictroides* var. *cornuta*, which is found everywhere throughout the swamps, as well as rooted plants such as *Ceratopteris thalictroides*, species of *Limnophila*, *Hygrophila* and a whole range of well-known *Cryptocoryne*.

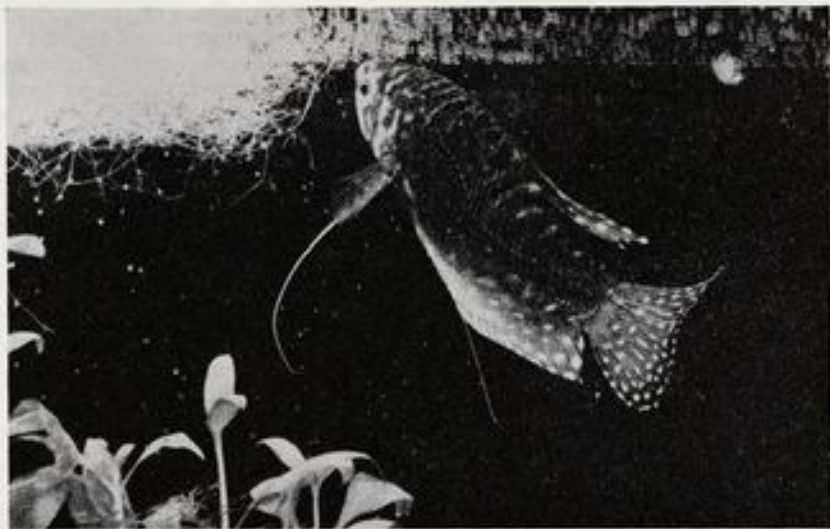
As for the fishes, there is certainly no lack of choice here. We find representatives of the barb family, *Rasbora*, *Brachydanio*, *Laubuca*, *Aplocheilichthys*, *Botia*, *Acanthopthalmus*, *Dermogenys*, *Betta*, *Trichopsis*, *Colisa* and the well-known and popular *Trichogaster*.

In captivity, the blue gourami and its subspecies 'Cosby' readily reaches a length of 4½ in.



As the pair begin to sink with hardly a movement of their bodies the female is slowly inverted and the eggs (seen here above the upturned female) are released. The male's milt is discharged at the same time.

The male collects eggs in his mouth and blows them into the bubble nest, which he guards until hatching of the fry takes place. Some eggs can be seen floating at the water surface in this picture



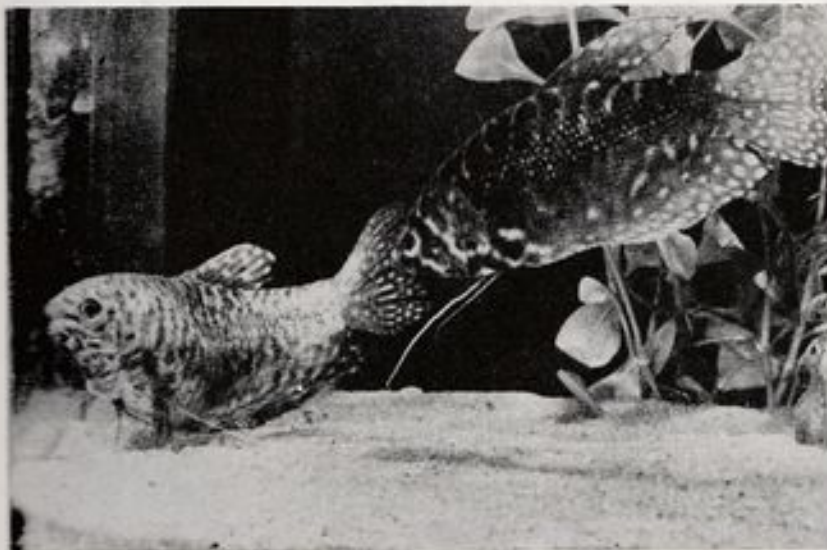
but in spite of its size the fish is peaceful with smaller fishes, and in all respects undemanding. It does, however, require a lot of living space and it may be for this reason that, although the blue gourami is a splendid fish and no novelty in our aquaria, it is not perhaps one of the foremost favourites with fishkeepers. And that is truly a pity because it is a fish well worth recommending to beginners—and I hope that these photographs and my notes will revive interest in it.

Since in its home waters the blue gourami must live in ponds and ditches very poor in oxygen, Mother Nature has provided this fish with a supplementary breathing organ, the labyrinth; it is this

organ that is characteristic of the family Anabantidae, to which the gouramis belong.

For breeding, fish in their second year should be used. It is best to choose a breeding tank with a capacity of at least 15 gallons. Normal tapwater at a temperature of 80-82°F (26-28°C) is used and planting is optional although a few floating plants should be placed in the aquarium as the blue gourami is a nest builder. Both the parent fish can be placed in the breeding tank at the same time, or the male can be put in first. The male builds its nest in the floating plants from air bubbles mixed with secretion from its mouth

Meanwhile the female is brought into readiness



After the spawnings the male drives the female away from the nest, and unless she has protective cover available for her it is best that she should be removed from the tank before serious damage to her fins occurs

by the male's ramming her, nibbling her fins and, if the nest is not completed, chasing her. The actual pairing takes place in the usual gourami method whereby the female is wrapped around by the male's body and turned on her back with the result that the eggs she expels, being lighter than water, float up to the surface. There they are collected by the male and spat into the nest. The spawning procedure is repeated several times and lasts for about 2 hours, during which time about 1000 or more eggs are produced. After a month or 6 weeks the spawning process can be repeated with the same pair.

The female is removed after the spawning so that the male can get on with the task of hatching

the eggs. The young fish leave the nest on the third day and the male should then be removed and the newcomers fed with the smallest live food available. Over a period larger food particles can be introduced.

In the third week from birth, there is a 'crisis' in their growth for at that time the young develop their vital labyrinth organ and should be fed with fine powdery food, since the little fish can easily choke on particles that are too large. The tank for rearing the fry need not contain more than 6 inches of water, but the tank must be covered so that there is warm moist air above the water surface. In the fifth to the sixth weeks the fish should be sorted to size. They are sexually mature at 10 months.

Guppy Types No. 9: The Lyretail

LIKE some supersonic boom arriving after the event, the first guppy variety to be given preference by the Fish Culturists' Circle in 1937 was the lyretail. This first guppy standard allowed for a flexible shape of the finnage but gave top marks to the gold-bodied male, with a caudal shaped like that odd, harp-like musical instrument—the Grecian lyre. It was well-named because this instrument usually accompanied poetry and to those early breeders the lyretail was poetry in motion.

Its popularity and challenge never waned and later led to its adoption as a club emblem by the Guppy Breeders' Society and subsequent F.G.B.S. In both these groups it was also the shape used for their silver, gold and gold-jewelled show merit badges called 'pins'.

The published 1939 standard for this variety of guppy sported a dorsal fin similar in shape and length to the three modern swordtails. This was changed in 1952 and contemporary outlines have a reduced dorsal length and the insertion into the top line of the dorsal of an attractive dip. Length of the caudal extension is at present to be 13 mm. (½ in.).

Published illustrations of the American 'lyre' don't do the guppy justice. Lacking the truly classical shape, they resemble an English veil with a chunk taken from the end of its tail.

Generally seen in all basic body colours, it was the lyre displaying a gold-coloured body that seemed to



1937



1952 USA



1952



1970



1960

carry off the awards. In 1957 the Federation's Biological Study Group, in a report on guppy standards, had this to say about the lyretail: 'A very rare and beautiful fish and when observed with a gold body is a sight not easily forgotten'.

Pity that so many of today's breeders try to pass off poor double-swords as this variety. I suggest that they fail to recognise the very slight mutations from swordtail stock that occasionally point the way to breeding lyretails. If you are starting from scratch and cannot obtain any lyretail stock then try crossing a double-sword displaying a fore-shortening of the caudal extensions with a clear-finned, roundtail female. Success won't come overnight but the hard work is very rewarding.

The finest specimen I have ever seen was entered in the First F.G.A. International Show held in Manchester in 1966. At this 2-day event, guppies were benched on the Friday

and winner of the Lyretail Class was a superb specimen that earned its owner (a headmaster), a Silver Award. Come Sunday and the fish was dead: its over-enthusiastic owner had fed colour food to excess in the show jar and polluted the water. The real tragedy was learned later when we found that the distraught owner had failed to ensure the furtherance of this fish. It died a virgin! Though its genes were lost forever it taught us a salutary lesson. Never show any guppy until you have ensured that it has become a parent.

The Association's 1970 event saw Mr E. Smith winning with a lyretail that scored 74 marks. At first glance, the non-specialist may not think that such a high set of points, but in guppy circles 74 is quite good. It shows, at least, that the lyretail isn't ready yet to join the ranks of the relegated.

J.K.



Personal COMMENT

by
ARPEE

ONE of the commonest and least amusing of human failings is the inability to admit of being ignorant of any given fact. Perhaps it is that radio and television interviews demand that, whatever the situation, the speaker has to say something, however absurd or banal, so long as he never admits to not being an expert or to having failed to do his homework properly.

It is regrettable that a number of distributors within the fishkeeping trade have fallen into equally bad habits when it comes to selling their imports. Despite the Trade Descriptions Act it is clear that the naming of species still falls far short of what the law intends. It is perfectly true that in most cases the errors in nomenclature do no great harm and that in others fish are mis-described because of sheer ignorance on the part of the vendors, but I cannot believe that this accounts for more than a proportion of the howlers one sees around and about.

Most frequently the inferior 'close relations' of a popular fish are marketed as though they were the real thing and some dealers try to pass off the awkward situation by suggestions that the real colour will return once the fish have settled into your tank. There is never any suggestion of a money-back guarantee, though! In other cases where the dis-similarities are a little too obvious for this ploy to succeed, the 'unknown' fish is described by linking its most prominent feature with its common family name. For example, any little grey or brown fish with a red glowing eye will be listed as a red-eye tetra, and if it has any spots distinguishable from 'ich', it will undoubtedly market as spotted red-eye tetra (rare).

Now, I have seen the other approach. Some dealers proudly label a tank 'Un-named Tetra' or 'Un-named Corydoras' or 'New Characin': sometimes the country of origin is mentioned as well. This method of handling the situation appeals to me on two counts. One is that it is completely honest, as the law demands, and the other is that it is psychologically sound because labels hinting at any form of mystery surely bring out the detective in us and introduce the element of challenge without which almost every hobby would degenerate and fail.

I am not at all sure, however, quite how necessary it is for many of the lesser known tropicals either to be mis-named or to be not named at all. Within the past few months I have had two examples of local misnamings which I have verified within minutes by consulting either Sterba or the Looseleaf Edition. Since I am in no way skilled at nomenclature at least two professionals before me (the importer and the retailer) have failed to do their jobs properly, and I don't think it is good enough. Life being what it is prices are rarely abated for mystery fish,

and as a consequence you are probably paying as much for an 'inferior' species as for the time-proven and gayer fish to which you are probably, morally, entitled. I have yet to experience any bargains in this connection, but I am sure that readers would be absolutely delighted, as would I, to hear of anyone who has ever done well as a result of wrong naming of fish.

The sadist in me suggests that, every time I see a mystery fish on sale, I should buy it and form a collection in one large tank. Quite what effect this would have on certain knowledgeable visitors who have never confessed to failure in naming anything that swims, flies or walks would be educational in all senses of the word. Seriously, the idea might have some appeal to club secretaries who want to introduce an 'ice-breaker' at their next big meeting, or to the show secretary in search of something a little different. I fancy that the secret for success is that the key list is never actually divulged. At all events it should result in enhanced sales for Sterba and Looseleaf Editions.



We all have our 'black spots' in aquarium-keeping. Some of us can never quite cope with algae, others can never keep up a succession of micro worm cultures, whilst yet others are totally inept at making plants grow. One worry which has obsessed many aquarists is the make-up of the local water, and they live in dread that variations in acidity or hardness will harm new importations. This latter point is one which has never greatly bothered me or my fish either and I have found that half tap water and half rainwater has given consistently good results over a number of years.

When I saw some black-banded sunfish on sale a few weeks ago I invested in a trio because I can't resist bass or sunfish or their like for very long, and the delicate markings and attractive bearing of the specimens on sale made them good candidates for a tank that was shortly falling vacant. I released them into the quarantine tank at about midday and by 10 that evening one was obviously dying. By the following morning all three had succumbed. They had all fed quite well at about 2 p.m. the previous day.

Continued on page 510



A Pool for the Garden

COLDWATER SCENE



Concrete pool in the garden of the author's former London suburban home

By D. SMALLEY

Photographs by the author

most important, and ideally should be in a good sunny position without any nearby trees. Apart from encouraging good plant growth, sunshine helps in maintaining a higher water temperature, which in most cases is an asset.

Choice of Site

I have four pools, one of which is unshaded and faces south. In contrast, another pool shaded by the house faces north, and in the summer months a constant difference of 10°F (5-6°C) is recorded. It may be of interest to potential goldfish breeders that I have never known fish to spawn in this latter pool, although I have tried on several occasions. Another disadvantage of the colder pool is that in the winter months ice is much more prevalent and difficult to clear.

Always avoid placing a pool near to trees, especially if they are not evergreens. If you don't follow this simple rule you will soon find leaves blowing into the water and causing pollution. Make sure before you begin that the pool will not be low-lying, where freak storms can cause not only overflowing but also flooding of the surrounding area. It wouldn't be the first time I have seen fish swimming over the top of a pool on to the adjoining garden, only to be lost down the drain!

What Size?

All my four pools are of different sizes. Many articles and books have been written on the subject of pool size, but from experience I find that I now disagree with much of the advice concerning depths etc. I live in the southern half of the country, which is an advantage, and I would suggest that only a small proportion of any pool need be as deep as 18 inches. Those who advocate depth as a help to success usually have in mind the wintering of the fish, but I reckon that, for normal winters south of the Wash, at least one area with a depth of 18 inches, is quite sufficient. I hope it may be possible for this subject to be given more consideration in a later article, but for the present let us think of the summer, when our pond is a feature of our garden, and the time when we see most of it.

Goldfish generally will bask in the sun and swim near the surface where the water is warmer, and so the lower part of the pool will not be used a great deal. I have found that pellet food thrown into a deep pool sinks to the bottom, which is cold, and young fish will not go to the

FROM visiting local aquarist clubs I find that the interests of members generally have broadened a great deal over the past 20 years. It is now no rare occurrence to find club members keeping both freshwater and marine fishes or both tropical and coldwater fishes etc. Two of the contributory factors are the vast improvement in, and diversity of, equipment now available, together with increased knowledge and existence of specialist societies catering for and promoting virtually every aquatic interest.

With the advent of fibreglass ponds and various types of waterproof sheeting, many people have installed pools in their gardens. However, often they have little knowledge of pond management, and things have gone wrong and disappointment has soon followed. Methods of pool construction have been covered before in *PFM*, so we will deal here only with fundamental points affecting pool maintenance.

Often some problems come to light only when it is too late and impossible to correct them, so before taking any action, think things over carefully. The site you choose is

cooler water to eat, although they are hungry. It could be suggested that an air line or fountain would solve this problem, but the pool would still be left with an average temperature lower than that of a similar but shallower pool. Last year I found that a small 4 ft. by 3 ft. sunny pool grew on 50 young lionheads three times as fast as a 13 ft. by 4 ft. deeper pool which contained around 75 fish.

Deep water can affect the plant life too. Remember that rooted plants cannot swim to the surface and as if in protest they rot back and die. The difference in temperature could be as much as 10°F (5-6°C) between a shallow and a deeper pool—next time you've got your sleeves rolled up, why not put your arm in and see!

The Stock

When the pool is completed, the next step is to obtain a selection of submerged and marginal plants. If your pool is made of cement, though, the concrete should be allowed to cure before adding plants or fish. The best way to do this is to fill the pool to the top, then scrub around the very top with a clean brush. Empty after 2 days and thoroughly scrub the entire pool. Refill and leave to stand for a week. Empty, scrub round, and your pool is ready for planting.

It may be that you cannot get the plants of your choice. In such circumstances it is better to take substitutes than to start with half your requirements, hoping to add the remainder later when they become available. There is little doubt that it is the lilies and various marginal plants that make pools so attractive, and if you do not grow enough of the submerged plants you will attract one of the common forms of algae.

Green water, or suspended algae, gives many pool owners problems, but by understanding how it occurs you will be helped in solving the situation. If when you set up your pool you do not provide enough plants to use in sunlight the available minerals—nitrates, sulphates etc.—in the water Nature will step in and supply you with plant life in the form of green algae, blanket weed, blue-green algae etc.

When you first set up the pool, the surface can be shaded with a little duckweed until the plants really make headway and the lily leaves begin to spread. When planting marginals, always use the planting baskets made for the purpose. Line the interior with clean sacking before filling with loam and leave room for an inch of shingle or ballast on the top of the basket to stop the loam washing out.

I have found the baskets available too small for lilies and I now use large plastic buckets with holes drilled around the bottom. The advantages are that, for a start, the container is larger and, secondly, the bucket handle facilitates lifting the whole out of the water when the pool is being emptied.

It is always better to get the plants growing first before introducing any fish. Apart from the risk of plants being pulled up and eaten before becoming established, fish excreta and uneaten dried food without established plants will promote green or cloudy water. When the pool is finally established the water should be crystal-clear, and this condition should not alter when fish have been added.

Next month: *Basics in Goldfish Feeding*



Marginal plant known as rats' tails seen in planting crates removed from the pond. The profusion of roots indicates its ready growth

Jobs for This Month

- Most parts of the country suffered a cold spell last month and the premature stirrings of plant life in the water garden came to a halt. However, green stems should begin to lengthen this month and some of the first aquatics and marginals will be in the shops. Don't be put off by the unprepossessing appearance of some of these—by June or July they'll be looking just like the pictures in the book. Buy them when you see them. Don't wait until you see the plants in full glory in someone else's water garden and expect that you can then walk into a shop and buy similar ones—you'll be out of luck!
- Around the pond side, you can lightly break up the soil between the primulas, irises, mimulus, marsh marigold and so forth with a small fork and spread a thin dressing of peat and bone meal. More potent plant feeders are undesirable in this situation where rain might wash them into the pond. Pull out the weeds at the same time and use newly obtained plants to fill any bare areas, or to occupy gaps between rocks.
- Before the water garden develops into its full splendour now is the last time to think whether you will want to take electricity out to the pool this year. As well as

fountains, waterfalls, cascades etc. to be worked by a pump needing a supply of current, there are also the possibilities of putting in a pond filter or floodlighting above or underwater, as well as having a point for a pool heater available next winter. If you bury the cable out to the pond it must be at least 18 inches below the soil surface and should be covered with a line of old bricks or stone slabs before filling in the trench. The cable should be Mineral Insulated Copper-Sheathed Cable (3 core) with PVC Overheath. The switched weatherproof socket (13 amp) fed by the cable should be screwed to a

concrete post or fixed in a drained, covered underground cavity close to the pond. Connecting the cable to your house mains and testing the socket before use should be done by a qualified electrician.

• Weather being normal for the time of year, the fish should be looking about for food and towards the end of the month you can begin to offer food daily. Small earthworms will be plentiful around last year's leaf piles and they will make excellent conditioners for your breeding goldfish pairs.

For the Pond Shallows



Marsh marigold (*Coltsa polustris*). Easily spotted when in bloom because of its large, brilliant yellow flowers. The leaves are dark green, broad and glossy and resemble those of the water lily at first sight. Flowers from March to early June and occasionally during the period to August. The plant attains a height of about 1 ft. and the stems are hollow, but quite thick and fleshy

Photograph by
the author

ONE of the most eye-catching wild flowers that blooms in the spring, and sometimes as late as August, is the marsh marigold. It

often chooses seemingly quite ordinary and accessible places to grow, but many are the would-be collectors who have fallen for this flower's

brilliant trap. Its habitat is mainly marshy, wet ground, and often admirers collect a couple of soaking feet rather than the proud kingcup.

Those that are successful enough to bring some blooms home are disappointed, for they soon wilt. The marsh marigold is not suitable for the indoor vase, and in any case, looks far more beautiful in a natural setting. Cattle and other animals find the inviting flowers and foliage quite unattractive and leave well alone.

However, the pondkeeper can grow it very easily in the shallows of the garden pool. Collect the plant as soon as possible if it is to bloom this year, preferably before too much new growth has been made, ensuring that any root damage is kept to the minimum. Wash well in clear, clean, running water to remove any unwelcome pests before finally installing in the planting basket supported just below the surface.

An unusual plant for marginal use in shallow water; a regal and worthy addition to any outside pool.

JOHN GATES

Personal Comment

continued from page 507

The literature on this fish states quite clearly that it is a bad settler and that it is susceptible to water changes. On the other hand I recalled that a rhinoborn goby had undergone quarantine in a container that I had floated in this tank and which had somehow capsized, discharging its small volume of brackish water into the freshwater of the larger tank. I forthwith introduced some daphnia and gnat larvae into the offending water to test for pollution, but as they were happily going about their business several days later—though by then the gnats were airborne—I was very little the wiser.

It would seem that the water was not poisonous to life by virtue of any salt reaction on bare metal so I can only conclude that the water, basically, was so inimical to the

wellbeing of the sunfish that they gave up the struggle. This was a sobering and rather sad example of the danger of thinking that on any given aspect of aquarium keeping you are unassailable.

I went wrong on two counts. I omitted to read up the species before buying it and I thought that my mixture of water was right for anything and everything by being of a 'middle' nature. It looks as though I shall have to try again, for my appetite has been whetted. Quite apart from the attractive appearance of the black-banded sunfish they are said to breed fairly readily in tank conditions even though they have something of a nervous disposition. They therefore appeal as personalities right from the start, and if they favour you with a family in due course the tribulations could be said to be in a very good cause.

The corollary is, of course, not to trust the daphnia test too implicitly. There are parameters of tolerance and intolerance which we have to establish for ourselves, often after lengthy and sometimes expensive research.

Readers' Queries Answered



Gravid Spot

My female guppies have, on occasion, shown a dark spot above the vent. Though they swell up and show signs of being pregnant no young are seen. Is something wrong? What exactly is the 'gravid spot'?

The gravid spot arises because the inner membrane lining the abdomen (peritoneum) stretches with the expanding contents of the pregnant abdomen. During this period the contents darken and are easily seen through the semi-transparent sides of the fish. Sometimes, though, dark pigmentation in the outer skin obscures this. Conversely, some guppies lack this increased pigmentation and thus remain pale. Generally, the darkening of this area is indicative that the fish is gravid. Abdominal disorders can simulate the swelling and dark coloration. If no fry appear within 4 weeks of the above symptoms, check on the health of the fish. As to your not seeing any young, never omit the possibility that they are being eaten. They could be cannibalized by either the parent or other fish present. We have witnessed females eating their young as soon as they were born. Try using a proprietary breeding trap or plenty of plant cover.

Filter Browning

Every few weeks I find I have to dismantle my filter delivery tubes because they are covered in a brown scum. Though the fish seem healthy the plants don't seem to grow. Can you suggest a solution?

The brown discoloration is caused by a form of algae or diatoms. That they occur so frequently and that your plants aren't growing, is suggestive that the aquarium isn't getting enough illumination. Try leaving your lights on a little longer each day. Don't at this stage increase the wattage of your bulbs (or tubes—you

don't say which). To clean the filter tubes, soak them in warm (not hot) water to which a little detergent and a spoonful of vinegar has been added. You will find a set of the flexible brushes made by Inter-Pet very useful for getting into those awkward places. Make sure the filter box and tubes are thoroughly rinsed in clean water before returning them to the tank.

Fish get Goitres

At a recent club discussion on fish diseases the question arose: 'Can fish suffer from goitre?'. To restore order in an otherwise peaceful society we seek your valued help.

The relationship between enlargement of the human thyroid gland, known as goitre, and a lack of iodine in the diet was established in the early part of this century. One of the most significant contributions in the fish world on this subject was made by a scientist called Marine, who studied goitre in the American brook trout, *Salvelinus fontinalis*. The condition in the fish was marked by a conspicuous swelling accompanied by reddening of the pharyngeal area in fish reared in a hatchery. Research showed that this was due to the food being deficient in iodine. When whole sea fish was added to the diet of the trout the condition was alleviated.

Food Pests

I have been buying the larger drums of dried foods and though I realize you should keep them well stoppered, like all members of our human society I admit to being careless. This has resulted in my drums of food becoming contaminated with tiny insects. Not being an entomologist I have had great difficulty in finding out what these creatures are. Can you help me? I'm sure your answer would be of interest to many of your readers.

Mites of various kinds are common

contaminators of foods but insects such as weevils also can be present. The British Museum of Natural History publish a very good book on the subject, profusely illustrated, for 171p. It is called COMMON INSECT PESTS OF STORED FOOD PRODUCTS and is in the Museum's Economic Series, no. 15 (by H. E. Hinton and A. Steven Coebet).

River Scene

I would like to set up a tank for my son containing some of the more interesting river inhabitants. Can you give me any hints about keeping it in order—there will be no problem about obtaining fishes such as Miller's thumb and loaches.

It is possible to set up a very attractive aquarium to house some of the occupants of local streams. Both the fishes mentioned, loaches (*Cobitis barbata* and *C. taenia*) and the Miller's thumb (also known as bullheads, *Cottus gobio*) make good aquarium subjects. A light sand and gravel mixture for the base makes an attractive foil to a heavy planting of dark-leaved water plants such as *Elodea*, *Myriophyllum* or hornwort. The tank will also require a number of medium-sized stones under which the loaches can hide and which will provide shelter for the bullheads. The latter have large mouths and are not suitable companions for very small fishes, but loaches can seek protection under the stones. Both types of fish need to be fed with worms and small pieces of meat. Minnows are another attractive aquarium inmate, but they are shoaling fish and require large, shallow tanks. Cool conditions should also be maintained for river fish and particular care must be paid during the summer months to ensure that the temperature of the water in the aquarium is well below 65°F (18°C).

How Many?

I have only two moors left now in my 24 in. by 12 in. by 12 in. coldwater aquarium. I would like to replenish the stock and am thinking of adding two small sun fish. How many can I get in order not to overcrowd the tank?

You give no indication of the body size of the moors but in a tank of this size it is possible to keep large fishes with body sizes totalling not more

than about 12 in. Assuming that the moors are now about 3 in. each in length, you could add two or three other small fish. It would not be a good idea, however, to add sun fish. These attractive fishes are carnivorous, robust and aggressive and life would become very unpleasant for your moors. Far better to obtain a couple of small veiltails or fantails, or, if you prefer variety of shape, bitterling or small rudd.

Bloodfin Breeding

I have a very obvious pair of bloodfin and would like to try to breed them. Are there any particular points to remember?

It is advisable to use a 24 in. tank when breeding bloodfins as the spawning is an active one and the fish require plenty of space. A depth of 6-8 in. of water is sufficient and a temperature of about 78°F (26°C). The breeding tank must also contain

plenty of leafy plants, such as wisteria or Indian fern; a surface covering of Riccia may suppress the final leap out of the water that forms the climax of the spawning chase. The eggs will sink to the bottom of the tank or lie hidden in the plants. The parent fish must be removed immediately the spawning has been completed as they are avid egg-eaters. The fry are very small and must be supplied with plenty of Infusoria in the early stages.

THE AQUARIUM CATFISHES—18

Catfishes that Stick

IN the hill streams of the world, fishes are presented with circumstances of an entirely different nature from those of the more ordinary lakes and rivers. One of the remarkable adaptations to such an environment, which appears with reasonable frequency in hillstream situations, is the ability to hang on to some relatively steadfast object with endurance equal to the strongest torrent. The fishes of the family Sisoridae (sis—the act of, coi—the mouth, a mountain) have in some cases evolved a tremendously efficient adhesive apparatus that allows them to maintain their positions in the swift Asian mountain streams where the bulk of them reside.



Glyptothorax major Boulenger has an adhesive organ on its underside

The sisorid catfishes have developed an unusual system for sound reception, which employs the gas bladder and the Weberian apparatus (the connecting system between the gas bladder and inner ear that is found in ostariophysians). Only an anterior chamber of the gas bladder is retained in these fishes, and it is sometimes encapsulated in bone and placed so that its outer edges are in contact with the skin through an opening from the capsule. Vibrations striking the skin would cause the bladder to vibrate, and this in turn would transfer the vibrations through the Weberian apparatus to the inner ear.

In a manner somewhat like the little loach-like hillstream fishes such as *Gastromyzon*, the sisorids have in some cases forsaken the normal respiratory manner of fishes. Because of the highly oxygen-charged nature of the swift hillstream water, sufficient respiration is apparently accomplished by rapidly moving the opercular (gill) flaps. *Oreoglanis* of Thailand faces the current and extends its

Family Sisoridae

By BRAZ WALKER

long nasal barbels vertically, possibly deflecting the current into openings useful in respiration. In Thailand *Oreoglanis* is known as 'stone-sucking fish' because of its ability and habit of clinging to stones or other objects in the face of the torrent and even when removed to quieter waters. The 'sucker' apparatus of this fish comprises the lower lip in combination with a number of corrugations on the front and sides of the head.

Sisorid catfishes, aside from living in Himalayan and other hill and mountain situations of highly oxygenated, rapidly moving water in which small size, streamlining and an effective adhesive apparatus are almost necessary for survival, have also developed specific adaptations for a more normal life in the larger rivers and streams. *Sisor* is said to reach a length of 8 feet, and *Bogarisia* almost as much, with a much wider range through India, Burma and Thailand and beyond.

Although these larger river catfishes mostly are without an adhesive organ, *Glyptothorax* has at least a correspondingly wide if more specialised range, and a highly effective thoracic adhesive organ. The loose folds of puckered skin on the underside of *Glyptothorax* and its relatives that possess similar holding devices can either be used as a non-skid surface (similar to the tread of a tyre) or can be raised to create a strong vacuum (in a manner similar to the shark-sucker *Remora*).

Members of the family Sisoridae are probably at best only occasionally included in shipments of aquarium fishes, but certain genera such as *Glyptothorax* would be highly interesting to the collector. Because of the small size of most species of this genus, from this standpoint at least they would probably make good aquarium fishes. Well-oxygenated, clear water at relatively cool temperatures would probably meet their requirements. The wide range of *G. major* might indicate considerable adaptability although as with others it is almost invariably found in clear streams with rocky bottoms.



Compact freeze-drying equipment

maximum convenience of use, cold-storage facilities in the home.

Now, however, with the relatively new technique of freeze-drying, food scientists have developed a novel method of food preservation having the advantages of the two older systems but without their disadvantages.

The scientific basis of freeze-drying is, in fact, not all that new; a Mr William Hyde Woollaston demonstrated the technique to the Royal Society of London in 1813 and apologised for wasting the Society's time with something already so widely known! The process began to be applied practically for special scientific work in 1890 but the first large-scale use came about during World War 2 when the extreme gentleness of this preservation method proved to be ideal for use with blood plasma and penicillin.

The process of freeze-drying is well-named as it involves: 1, cooling the product to freeze all its water into ice; 2, drying it by removing the ice but without heating up the product during this drying process.

Sink as a Pond

Could I use a deep sink as a small pond? It has been in use as a sink garden but I would very much like to keep some fish in it.

It is quite possible to use a sink in this way, though the fish should not be wintered in it as it will almost certainly be too shallow to provide

protection against ice. During the summer months, however, it could make a very suitable container for a couple of acclimatised fancy goldfish, veiltails, for example, or fantails. Cover the bottom with well-washed gravel, add a clump or two of a submerged plant such as *Elodea*, hornwort or *Myriophyllum* and add a small water lily planted in a pot

(lilies recommended for shallow planting include *N. tetragona* and *N. odorata*). You will have to take great care with this sort of container to see that it does not become a source of pleasure to the local cat and it may be necessary to provide a net protection for it to be used when you are not in the garden.

How is this achieved? The process is based on the principle that as atmospheric pressure drops so does the boiling point of water. This scientific fact is demonstrated in every-day terms by the way that the temperature of 'boiling' water decreases as one's altitude gets higher, so that high altitude climbers, as in the Himalayas, cannot make themselves a decent cup of tea. At the top of Mount Everest the air is so rarefied and the pressure so low that 'boiling' water is only 'warm' and will not 'brew' tea.

In the application of this to the freeze-drying process the material is first of all frozen and then placed in a sealed chamber, from which, by means of a vacuum pump, the air is removed and a very low pressure produced in the drying chamber. Just enough heat is then applied to the material to balance the latent heat of vaporisation of the frozen water. In this way carefully controlled evaporation takes place and the bulk of the water present can be removed without causing any increase in temperature of the frozen material. Once all the water has been removed the vacuum can be released and the now dry material allowed to come up to room temperature. What remains is a perfectly dried foodstuff with all the original flavour, smell and texture and yet in a form which can be stored on the kitchen shelf almost indefinitely without any deterioration in its nutritional properties.

This is not a cheap process to carry out but there are many specialised instances where the extra initial cost over and above conventional methods of preservation is worthwhile.

The production of freeze-dried foods for aquarium use is one of these instances. The aquarist, or more precisely his fish, gets all the advantages of live food (except the wriggle) with none of the disadvantages. The freeze-dried product is always to hand in an easy-to-handle, clean, dry form. No messy cultures or tubifex washing bowl to annoy the ladies of the household. No fear of introducing infection or disease into the tanks. (Although a note of caution here: freeze-drying preserves bacteria as well as foods. For instance, tubifex worms which are suspect sources of bacteria before freeze-drying will be equally suspect afterwards. Therefore good-quality freeze-dried foods for the aquarist can only be produced from good-quality raw materials.)

But there is no doubt that freeze-dried foods, produced by reputable manufacturers, will find increasing acceptance by the aquarist-hobbyist. Together with the ever-improving quality of the already well-established flaked fish foods they will provide all types of fish with a nutritionally satisfying and appetising diet in a form quick and simple to feed. This will leave the aquarist more time to devote to the more interesting and satisfying aspects of our hobby.

STARTING WITH SEA WATER

For those just beginning with tropical marines—the basics of sea water technique

SEA water might look much the same as water out of the tap, but among the first things the marine aquarium-keeper learns about this basic requirement for his marine tank are (a) that this fluid cannot be treated as if it were tap water and (b) that it is quite a costly commodity. It need not be expensive if you live close to the sea but this raises the question—is the sea water from the coast suitable for the precious coral fishes we hope to keep in it?

First let us see what special considerations must be given to sea water for the aquarium. Owing to its content of many different kinds of salts, sea water can quickly react with or corrode many materials that pure water will either not affect or will take a very long time to affect. In particular, sea water reacts with metals. It should not therefore be brought into contact with metals, even with painted metals. Remember that as a mariner your concern about the corrosive action of sea water is not merely because you want to protect the material that it corrodes: the sea water becomes chemically altered by the presence of unsuitable metals in a way that can turn it into a killer liquid for your fishes.

Glass, glazed earthenware, and polythene and similar plastics are examples of materials not affected by sea water. Containers made of these can therefore be used for storage, collection or for making up your own sea water mixture. Metals coated with plastic (and nylon coating is the best of all) are thereby protected from contact with sea water and so aquaria with iron frames treated in this way are usable as marine tanks. Stainless steel has been used but the cheaper quality metal shows corrosion with sea water.

Like tap water, sea water loses water as vapour in the process of evaporation, and the higher the water temperature the greater the loss. What the marine aquarium-keeper must be aware of is that evaporation affects sea water by making its concentration of salts greater, which could have serious effects on fishes

I. Sea Water

placed in such water. What can be done to ensure that the natural strength of the sea water is maintained in the tropical aquarium, where evaporation losses are quite high, and how can the strength of collected or stored sea water be checked?

The instrument used for this is called a hydrometer. Its scale measures density ('specific gravity' or S.G.) of the sea water, which is a value related to the concentration of salts in the water. Some differences in density values are found in various samples of sea water so that it is usual to express the 'normal values' as a range: 1.020–1.025 (density at 15°C). In the marine aquarium evaporation losses will gradually cause the density measured with the hydrometer to increase. The density can be returned to normal again by mixing tap water at the tank's temperature into the aquarium.

As the hydrometer you purchase will have been calibrated for use in water at a definite temperature (stated on the instrument's scale and probably 15°C), it will give a misleading lower value if it is used in the tropical aquarium at 75°F (24°C). Therefore for complete accuracy in using the hydrometer, readings should be taken not in the aquarium but in a sample of the aquarium water placed in a glass jar and cooled to the hydrometer standard temperature. Then by placing the hydrometer in the jar at eye level, the hydrometer scale can be read accurately—rarely possible in the aquarium itself with the instrument either bobbing about or trapped against the tank glass. It should go without the stating that it is a mistake to purchase a poorly made cheap hydrometer.

If you must use a hydrometer that is calibrated at 15°C, for sea water at a higher temperature than this, an approximate correction of the reading can be made by adding on 0.002:

that is, a reading shown as 1.020 at 24°C is about 1.022 at 15°C; a reading shown as 1.025 at 24°C is about 1.027 at 15°C. For higher temperatures the correction number to be added is larger (about 0.003 at 27°C).

Strength of sea water is also sometimes expressed as 'salinity'. This gives salt content either as a percentage (usual range 3.0–3.6%) or in parts per thousand (usual range 30–36). However, these values are unlikely to be utilised by the beginner, for whom correct use of the hydrometer will be all that is required.

Natural or synthetic?

Sea water collected from any part of the coast is unlikely to be entirely clean. At the best it will have fragments of seaweed floating about in it and at the worst it can be chemically polluted with sewage effluent, detergents and oil. It's an interesting experiment to keep some unpolluted sea water aerated in a small aquarium: all kinds of marine life can appear, showing that larvae and eggs are common unseen occupants of sea water. All this means that natural sea water can introduce things into our aquarium that we might not want, and as the complete control of the aquarium's contents is what successful fishkeepers aim at, use of sea water from the coast is probably best avoided by the beginner.

The commercially available sea salts, which are 'synthetic' only in the sense that the component salts have been artificially mixed together to a recipe based on the chemist's analysis of oceanic sea water, give satisfactory results. They are not cheap but after the initial outlay further expenditure on this item is slight—unless you fail to protect your investment!

It's worth the extra trouble involved to observe all the precautions, implied if not stated, in the instructions with the sea salts: mix the contents of a sea salt pack into fresh tap water, about 2 gallons less than the stated final made-up volume,

and stir it until the bulk of the salt has dissolved. Aerate the solution for at least 24 hours, stirring occasionally if any significant amount of salt is seen settling on the container's base (stir with a clean plastic aquarium

scraper or wood strip). Then take the density reading and stir in fresh tap water until the reading is in the range 1.020-1.025 (at 15°C).

Once the sea water has been made in this way it can be stored under

cool conditions without undergoing change, but after storage for more than a few weeks it should be filtered through nylon and aerated for several hours before being used in bulk for an aquarium.

What's New?

Quality Fish-Rearing Tanks

AN interesting range of well-made equipment for the professional fish breeder, manufactured by Grice and Young Ltd., contains items of service to the keen amateur. In particular the **Grice and Young Rearing Tanks** (6 ft. by 6 ft. by 2 ft. deep and 2½ ft. by 2½ ft. by 10 in. deep), moulded in fibreglass, have built-in features that make them specially adaptable: a central drainage sump with a fine screen cover, an overflow pipe that can be angled to maintain the chosen water level and inlet pipe for running water. Water-driven Automatic Food Dispensers of several types, Fish Egg Incubators and a Live Fish Grader are other items described in a leaflet available from Grice and Young Ltd., Somersford, Christchurch, Hants., who will also supply prices of any of their equipment on application.

Aquarium Tongs

IF one wanted a clear-cut example of how aquarium accessory equipment has and is developing it would be well provided by the **Algarde Push Button Control Tongs**. Since the first 'picker-upper' for aquarists made from two springy (never quite springy enough) strips of wood, pincer-type metal tongs and several

designs of tongs with scissor grips utilising plastic parts have been seen.

For reasons of human anatomy the scissor grips are not easy to use with the arms held high, but with this latest push-button controlled device there is no need to stand on a chair to service the tank. The thumb is used to work the push-button whilst the hand-grip at the top of these light-weight tongs is held comfortably in either left or right hand. A single plant leaf or small snail can be picked up and held with ease by the plastic tong grips. The main part of this device is made of rustproof non-toxic metal, and its overall length is about 20 in. The plastic parts are of high-impact materials that are not easily damaged. A further suggested use for the tongs is in connection with indoor 'gardens' in glass carboys etc. Price of the Algarde Tongs is 62½p. Manufacturers: Algarde 401 A Ripple Road, Barking, Essex.

Power Filter

AMONG other operational and design features claimed by the makers to be major advantages of the new **Peterama 3-Stage Aquarium Power Filter** are ease of starting, ease of cleaning, ease of replacement of filter media, a 3-stage lateral as distinct from a vertical filter layer action and large filter surface area. Throughput of this external filter (first shown at The AQUARIUM SHOW '70 but not available in the shops until now) is up to 100 gallons per hour. Filter action involves (1) a special filter bag to remove coarse particles, (2) a finely porous foam block to remove small particles and (3) a filter carbon cartridge for chemical water cleansing. One section of the clear plastic filter box is free of contents so that inspection of the appearance of the water after passage through (1) and (2) and before it goes through (3) is possible. The media holders are readily slipped out the top of the filter box so

that any one can be cleaned or renewed independently of the others. A special filter medium for use with marine aquaria is also available, and all parts of the filter are made of non-corrodible materials. This filter is made in the U.S.A. and its price in the shops here is £11.75. Distributors: Peterama Limited, The Elms Estate, Church Road, Harold Wood, Romford, Essex.

Tubifex Keeper/Feeder



Cut-away view of the Feeder

MAKERS of the **Algarde Tubifex Feeder** claim that keeping tubifex worms fresh and odour-free and continuously available to the aquarium fishes is simple with this new device. It is attached to the aquarium glass by a fitted plastic sucker and on connection to the air supply the air-lift incorporated within it maintains water circulation for the worms in the cup. Another novel feature is the capacity to vary the rate of exit of worms from the feeder by changing the number of escape holes—4, 8, 12 or 24 'pull-out' points being provided by simple variations in the position of the central 'feed rate adjuster'. Beginners should be warned that, just as with any use of tubifex worms, only fresh, living worms should be put into a live food holder in the aquarium. The inner top diameter of the Algarde Feeder is about 1½ in. and it is about 1½ in. deep. Price of the feeder is 20p.

Take One Seahorse

By **TERENCE F. WEATHERLEY**

Of all the creatures of the oceans the seahorse is one of the most fascinating. This fascination led me to delve into the literature of seahorses. The path I followed was, at times, as tortuous as the creature's tail. Most books about marine aquaria make passing references to the species and more than one superficial account has been excused by the phrase 'numerous articles and books have been written about them', the same sources then neglecting to name the 'numerous books'!

I started my researches at the local library, which yielded Earl S. Herald's excellent book *LIVING FISHES OF THE WORLD* and a couple of other books, one of which suggested that the photos illustrating the other were misleading and said that the ovipositor of the female clearly seen in one photo was a pin holding the dried specimen in position against a suitable background!

I thought that the Library of the Zoological Society of London would yield more material and I was not mistaken. It was not that simple, however, and although many books made passing reference to seahorses, there did not seem to be much detail. The Library does house many reports and research papers from all over the world and after consultation of the indexes by the librarian some useful, if elderly, material was produced.

THE PROCEEDINGS OF THE UNITED STATES NATIONAL MUSEUM, vol. 38 (1905), yielded an interesting account of the life history of seahorses by Dr Theodore N. Gill. I was amused to find that Dr Gill prefaced his article by stating that many papers had been written in various publications and that his paper was an attempt to bring all this material together in one paper.

THE ANNUAL REPORT OF THE SMITHSONIAN INSTITUTION for 1915 printed a paper by Charles R. Eastman, of the American Museum of Natural History, New York, entitled 'Olden Time Knowledge of Hippocampus'. Mr Eastman quotes at length from Dr Gill's 'interesting account' and looks at a number of interesting pictorial representations of common Mediterranean seahorse species taken from old authors and reproduced in a short popular article by Professor R. C. Osburn in the *ZOOLOGICAL BULLETIN*, March 1915.

The seahorse was known throughout antiquity and appears in Etruscan works of art, an example being an Etruscan pot now in the Boston Museum of Fine Arts that has ears in the form of seahorses with the tails conjoined. The same design is occasionally found on ancient Greek coins.

The seahorse is mentioned in the writings of Pliny the Elder (A.D. 23-79), the explorer and investigator extraordinary, who met his death by investigating the destruction of Pompeii too closely and being overcome by poisonous fumes.

Pliny describes the seahorse and gives it the name *Hippus* (Greek, a horse), but Pliny was not an aquarist and he seemed preoccupied with the apparent

medicinal properties of the creature. It was widely believed that the ashes of a seahorse mixed with pitch and tallow cured baldness, and that a roasted seahorse had laxative properties. Oil of roses into which a live seahorse had been dipped cured chills and fever, and powdered seahorse was a love potion!

This preoccupation with the medicinal properties is present in all authors until the fifteenth century and there was little attempt to describe the creature in a factual scientific way. Early printed books go some way to redress the balance. They publish both accounts and woodcuts of a more scientific nature and the drawings of the common Mediterranean species in Pietro Matthioli's commentaries on the *MATERIA MEDICA* of Dioscorides are excellent examples.

The drawing published in 1553 by Pierre Belon is rather fanciful but his concise description of the seahorse is excellent: '... its size does not exceed a finger's length. It has a tough rugose skin and neither men nor fish of any kind esteem it as food. Its colour is sometimes dark and in other cases white. The gills are laterally situated and its neck arched like a horse. It bears a small fin a little elevated along the back and another on the neck where it joins the head. The mouth is small and tubiform. Dead or dried specimens have a tail coiled inwards like that of a chameleon.' It would seem from the account that the writer had observed both living and dead specimens. The account is concluded with details of the medicinal properties already mentioned.

The first mention of a New World seahorse occurs in John Josselyn's *NEW ENGLAND'S RARITIES DISCOVERED* (1672), where in a list of fish occurs the following graphic description: '... But the most strange fish is a small one so like the picture of St George and his Dragon as possible can be except his legs and wings...'

Pliny's name for the seahorse *hippus* is retained today in the animal's scientific name. This is *Hippocampus* and literally means 'horse-caterpillar'. The hippocampids belong to the family Syngnathidae, which includes the pipefishes. There are up to 30 species of seahorse widely spread about the world and occasionally in Britain there are reports in the local press of seahorses being caught or washed up on the Cornish coast.

The largest species of seahorse, measured from top of head to tip of tail, is about 8 inches and the smallest measures about 1½ inches. Pipefishes, of which there are about 150 species, range in size from the largest at 18 inches to the smallest at 1 inch.

The seahorse has a long prehensile tail, which, when the creature is at rest, is wound around a convenient stem or rock. It is reminiscent of the tails of certain species of monkey or even the elephant's trunk. The eyes are capable of independent movement and this has obvious advantages when catching food. The seahorse needs living food but is rather slow-moving. It gets

over this problem by catching its prey by suction. Any small organism, once located, is sucked into the open mouth so quickly that its movement is not detected—one moment it is there the next it isn't. Young seahorses are reported to feed for up to 10 hours a day and need upwards of 3000 brine shrimp. Perhaps this accounts for the rather low success rate for breeding in aquaria.

The direction of travel is controlled by the position of the head. The seahorse is propelled along by rapid oscillations of the dorsal and pectoral fins which have a degree of synchronisation. When a seahorse is swimming at top speed the fins oscillate at about 35 times a second.

The reproductive processes of the seahorse are given in most accounts in many marine aquaria books. Dr Kurt Fiedler of the Naples Biological Station conducted some detailed study of the behaviour of seahorses and pipefishes in 1954, and a detailed account of the breeding habits of *H. brevisrostris*, *H. guttulatus* and *H. zosterae* can be found in *LIVING FISHES OF THE WORLD*.

The feature common to all species is the incubation of the eggs in the brood pouch of the male. He incubates them for a minimum of 8 to 10 days and they are then expelled. A brood of *Hippocampus hudsonius* was raised at the Steinhart Aquarium, U.S.A., and it was observed that the young were five-eighths of an inch when they emerged from the pouch. Fed on a diet of brine shrimp they reached a length of 2½ inches in 2 months, and 3 inches in 4 months. By 10 months the maximum size of 5-5½ inches had been reached. Another observation

of great interest was the speed of regeneration. A fin could be regenerated in less than 2 weeks.

Young seahorses are particularly agile during the first few weeks of life and it has been observed that while swimming the tail can be bent backwards in a reverse crescent, although the tail is only prehensile in a forward direction.

Evolutionary stages of the transition from pipefish to seahorse are represented by various species of pipefish found today. All pipefishes carry the eggs under the abdomen or tail and it is the brood pouch that marks the stages. The pouch can be very primitive, merely two folds scarcely covering the outermost eggs, or more complex and covering the eggs completely. The pipefish *Amphelikturus dendriticus* appears to be an intermediary stage between pipefish and seahorse. It has a partially sealed brood pouch and it has developed a prehensile tail, although the tail fin is retained and the head is partially bent to an angle of about 45 degrees. It is reported that less than two dozen of these species have been found and all of these specimens were found in the Bahamas.

Both seahorses and pipefishes can be kept in marine aquaria. Most authorities agree that seahorses should be kept by themselves as they are apt to be bullied by other fishes, and they need to be well fed with live food. A worthy addition to any marine collection, the seahorse has a recorded history that is, in some ways, as fascinating as the fish themselves.



GUPPY

World

TWENTY years ago investigation would have revealed that almost all the tanks of the specialist guppy breeder would have contained plants, gravel and at least one catfish. Today followers of the contemporary fashion seem to prefer to breed their tiny charges in tanks that emulate the cast of 'Oh! Calcutta'.

The drift away from the planted set-up to the bare tank was probably brought about by the scarcity and high price of greenery in some parts of the country; better filtration and feeding methods have obviated the need of those active vacuum cleaners, the *Corydoras* cats. At least that is what I thought until I started making some inquiries.

It seems that this preference stems from the need of the hobbyist to be constantly netting his fish for the show bench. 'I was constantly uprooting my planted set-ups,' said one enthusiast I questioned.

By PETER UNWIN

With the modern frequency of shows approaching almost every weekend, 52 weeks in the year, I saw his point. For those who would like a compromise why not try large bunches of a floating plant like *Najas*? When it is time to scoop up

your fish this plant can easily be lifted out and placed on one side until the netting is completed.

Pregnant females, to say nothing of newly born fry, seem to relish the odd plant cover, especially if it is near the water surface. Now I must ask yet another question: 'Has anyone got any *Najas* to spare?'

• • •

Along with Classical Greek and calculus, the City of Birmingham's road system has long remained a mystery to me. Even a map doesn't seem to help because no sooner is the ink dry than the City Fathers of this Midland metropolis instigate yet one more 'one way' system guaranteed to baffle the visitor. But even that doesn't deter me from attending what I consider to be the in-event in the British Guppy Calendar, the Annual International Show promoted by the Fancy Guppy Association.

Repeating last year's venue, this Mecca for the guppy enthusiast is again to be at the Glebe Farm Community Centre, Stechford, Birmingham, over the weekend of 29th

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New Supreme Championship Trophy to be Awarded at THE AQUARIUM SHOW '71

EVERY year the Federation of British Aquatic Societies runs a Championship Class competition through the member societies' open shows, in which 32 trophies are awarded: one for each basic show class and the others for the well-supported sub-division classes. Thus throughout the Federation's area there will be in each year a champion Siamese fighter, a champion toothcarp, a champion barb and so on. The Championship Class trophies are only for open competition and can be won outright by any fishkeeper. It is worth noting that all the awards at any Federation sponsored open show can be won by any competitor, regardless of whether or not he belongs to an affiliated society or indeed to any society at all.

To round off the Championship Class trophy competition the 1970 Federation Council has donated a challenge shield in memory of its late chairman Ted Jessopp. This perpetual trophy is to be awarded to the overall winner of the Championship Classes. This year the Federation, with the co-operation of *PETFISH MONTHLY*, has arranged for this competition to take place at The AQUARIUM SHOW '71 (29th-31st October, Royal Horticultural Society's Old Hall, London S.W. 1). Therefore winners of Championship Class trophies for 1971 will be showing the top fish in each class in one grand display, and from these the Supreme Championship winner will be decided. As all classes of fishes are catered for, everyone can enter.

Look out for details to see at which Federated societies' open shows the Championship Class trophies are being put up this year. This information will be given in *PFM* as soon as it is available.

F.B.A.S. Bulletin

I WOULD like to bring to the notice of readers of *PFM* the fact that the Federation of British Aquatic Societies has re-commenced publication of a quarterly BULLETIN. This newly resurrected venture is seen as an additional service to the societies, and their support is sought to keep the two-way traffic of information flowing between the societies and the Federation; as the editorial says, the aim of the Bulletin is 'F.B.A.S.—For Better Aquatic Societies'.

May I appeal to the societies to help the Federation help them by sending contributions of articles, news and views (many!), criticisms, moans and groans (few!) to the Editor (me!)—R. C. MILLS (70 Lee Road, Perivale, Middlesex).

Federation Publications

MR MAURICE CARTER, publications secretary to the Federation, writes: readers of *PFM* might like to know about the literature that is available from me and which will be of assistance to the smooth running of their societies. The literature also provides information to beginners in showing fish, plants, furnished aquaria etc.

1. CULTIVATED TROPICAL FISH SHOW STANDARDS booklet, 12p each (post free) or £1 per dozen to F.B.A.S. affiliated societies.
2. SHOW FISH GUIDES & TECHNICAL INFORMATION booklet, 12p each (post free) or £1 per dozen to F.B.A.S. affiliated societies.

The following publications numbered 3 to 11 are foolscap sheets, available free to F.B.A.S. affiliated societies—please enclose a 9 in. by 7 in. stamped addressed envelope with your request.

3. F.B.A.S. Judges' Pointing Sheets.
4. General Show Rules (parts 1 to 4).
5. The Aquascape Pointings and General Guidance.
6. The Furnished Aquaria Pointings and General Guidance.
7. The Plant Pointings and General Guidance.
8. The Pond Pointings and General Guidance.
9. The Rules Governing the Awarding of F.B.A.S. Stars.
10. The Open Show Trophy Rules.
11. The F.B.A.S. Show Class Lettering System.

The following two items are both

new ventures and the prices shown are applicable only to societies affiliated to the F.B.A.S. (prices will be given to non-affiliated Societies on request).

12. Self-adhesive 2 in. by 1 in. F.B.A.S. printed Award Stickers, coloured in accordance with Federation Show Rules for First, Second, Third, Fourth and Special. These are priced at 25p per set consisting of 24 each of 1st, 2nd, 3rd and 4th and four special labels. These award labels will be supplied free of charge for your open show on receipt of a show schedule and a 9 in. by 7 in. stamped addressed envelope.
13. Self-adhesive Exhibit Numbering Labels (2 in. by 1 in.) are priced at 25p per 100 label sets. Each Society will receive 100 Exhibit Numbering Labels free with their first order of these labels. When ordering please enclose a 9 in. by 7 in. stamped addressed envelope for prompt return.

For any further information required please do not hesitate to contact me.—MAURICE CARTER (15 New Road, Ascot, Berks. SL5 8QB; phone Winkfield Row 4885).

Guppy World

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to 30th May. It is Whit Sunday and though this usually means traffic jams, I feel sure those who do brave that great metal rash that breaks out on our roads each weekend will find it all worth while.

In addressing these remarks to my specialist readers I am preaching to the converted, but to the rest, especially the beginner, can I firmly bury a rumour? This show is open to everyone, whether an F.G.A. member or not.

To those who shrug their shoulders and say 'What chance do I have against them?', I reply: Every chance, as a glance at previous results sheets will prove. Believe it or not but these experts don't always have it their own way.

If you do have a leaning towards *Poecilia* why not come along and enter. One thing is for sure—your entries will be judged by the fairest adjudicators in the world.



When is an albino not an albino? A subject that has been banded about amongst guppy folk (and the world of science), with the relaxed manner of a berserk sergeant-major!

Confusion occurs because some so-called albinos display the familiar red eye only when viewed from certain angles; at all others they appear black like any ordinary guppy.

Research into the subject by expert Midge Hill reveals that these differences are caused by two independently segregating autosomal genes. Autosomes you will remember are those genes other than the ones responsible for sex found in every chromosome.

Midge says that both types of eye colour are carried on recessive genes and she is continuing her work in an attempt to find the answer to such questions as 'is one of these a new body colour?' or 'is one a new form of albinism?'

Our judges at least, await her findings with interest. Any information anyone can give on the subject would be passed on to Midge to help her investigation.



AT their fifth A.G.M. the tremendous growth of the MID-SUSSEX A.S. in the past year was reported. All of its ventures had been successful, including a jumble sale, fish exhibition and various stalls and floats at local fairs. The chairman's report took the form of a history of the Society, explaining how it had been formed, and how it had grown so rapidly that a number of changes in venue had been necessary. It was explained that now meetings are held at Ockley Lodge there was room for expansion; in view of the better balance sheet and assuming continued growth in membership, a building of their own, where fish could be bred, photographs taken and monthly meetings held, was not that far away for the Society! It was announced that both vice-chairman Mr D. Soper and Mr C. West, treasurer, are now F.B.A.S. B class judges.

In his speech, the vice-chairman announced that the South Eastern Aquarists' League had been formed, initially with six definite societies and a possible twelve others. Some societies were considering planning their 1972 programme to fit in with the League.

Show secretary Mr J. Walker remarked on the high standard of the 212 fishes exhibited in the nine table shows held during the year, and he mentioned this coming year's two-way inter-club show, to be held between Brighton and Mid-Sussex A.S. Other coming events include three new slide shows, a lecture on angel fish, to be given by Mr B. Baker, and a talk by Mr R. Butteriss on marine fish.

An interesting idea adopted at the A.G.M. should ensure that new members will not feel neglected and drift away from the club at an early stage—all new members, within 3 months of their joining, are to be paid a visit by a long-standing member, to inform them how the club is run etc.

President Mr T. Croucher then presented the cups and trophies for the year's table shows, and winners were also presented with the new Society folder with the club's emblem on the front cover. Results were:

Guppies, male: 1, 2, and 3, Mr D. Soper. Guppies, female: 1, 2, and 3, Mr D. Soper. Labyrinth: 1, Mr A. Jackson; 2, Mr M. Sparshott; 3, Mr J. Walker. Rainbow: 1, Mr D. Soper; 2, Mr A. Jackson; 3, Mr C. West.

Danio and minnow: 1, Mr C. Corbin; 2, Mr C. West; 3, Mr E. Johnson. Barbs: 1, Mr D. Waring; 2, Mr C. West; 3, Mr P. Waring. Cichlids (large): 1 and 2, Mr D. Soper; 3, Mr C. Corbin. Cichlids (dwarf): 1, Mr S. Calderbank; 2, Mr C. West; 3, Mr S. Short. Characins: 1, Mr N. Short; 2, Mr D. Soper; 3, Mr C. West. Catfish: 1 and 2, Mr C. Corbin; 3, Mr D. Soper. Sword pairs, egg-layers: 1, Mr C. Corbin; 2 and 3, Mr J. Walker. Sword pairs, livebearers: 1, Mr C. West; 2, Mr S. Calderbank; 3, Mr J. Walker. Furnished jar: 1, Mr R. Smith; 2, Mr D. Soper; 3, Mr N. Short. Furnished tank: 1, Mr C. Corbin; 2 and 3, Mr D. Soper. Fish of the year: 1, Mr J. Walker; 2, Mr D. Waring; 3, Mr B. Slade. Novices: 1, Mr G. Leach; 2, Mr K. Orange; 3, Mr S. M. Collins. Breeders, egg-layers: 1, Mr D. Soper; 2, Mr N. Short; 3, Mr J. Walker. Breeders, livebearers: 1 and 2, Mr D. Soper; 3, Mr C. West. A.O.S.: 1, Mr B. Slade; 2, Mr R. Butteriss; 3, Mr D. Soper. Killifish: 1 and 2, Mr J. Walker; 3, Mr R. Smith. Home aquaria: 1, Mr N. Short; 2, Mr A. Saunders; 3, Mr D. Soper. Livebearers: 1, Mr A. Kwasniewski; 2, Mr C. West; 3, Mr S. Calderbank. Coldwater: 1 and 2, Mr A. Jackson; 3, Mr N. Short. Exhibitor of the year: 1, Mr D. Soper; 2, Mr J. Walker; 3, Mr C. West. Junior exhibitor of the year: 1, S. Calderbank; 2, U. Ransom; 3, L. Tompkins. Junior home aquaria: 1, D. Ransom; 2, F. Johnson; 3, L. Tompkins.

THE 1970-71 season at EALING & D. A.S. ended with the Society's Presentation Dance, held at the Clubhouse. Trophies won by members during 1970 were presented by Mr Harry Towell (F.B.A.S.) to the following:

Ankin shield (total table show points), Mr J. Batts; Barrett trophy (furnished 4 in. by 4 in. show jar), Mr R. Mills; Batts trophy (highest pointed labyrinth), Mr J. Healey; Burbidge trophy (furnished aquarium at closed show), Mr R. Mills; Church trophy (Corydoras), Mr J. Batts; Cruickshank trophy (dwarf cichlids), Mr R. Sellers; Irvine trophy (one nominated fish shown four times a year), Mr J. Healey; Mills trophy (plants), Mr R. Mills; Rainbow trophy (highest pointed breeders at closed show), Mr D. Green; Savage trophy (home furnished aquarium), May Burbidge; Sellers trophy (Knock-out Cup), J. Ankin (jun.); Tagg trophy (for novices), J. Batts; Woodward trophy (highest pointed Junior's fish at closed show); J. Ankin (jun.).

A full programme of table shows has been arranged for 1971-72 and lectures enjoyed so far have been given by Mr C. A. T. Brown (F.B.A.S.) on judging fish, Mr Terry Cruickshank on livebearers, and a slide show 'Everyman an Expert', hired from Hendon & D. A.S. Dr J. N. Carrington of Inter-Pet will be addressing the Society on the 20th April when there is also a home match with Bracknell A.S. A note for those societies exchanging newsletters with Ealing—back numbers have been held until after the postal strike!

The Society received a feather in their caps when they were given an

excellent credit in the December editorial of the 'Bracknell Harlequin': 'I think that Ealing & District A.S. should be congratulated generally, and John Batts in particular, for their pioneer work in Aquascaping. Although this has been very popular in the northern part of the country, where it has a very staunch supporter in that very well-known personality Jim Kelly, it has never really been exploited in this area. But with Ealing setting an example, and members of the Judges and Standards of the F.B.A.S. having produced a set of standards, I look forward to the time when it reaches the popularity it so richly deserves, and becomes a regular feature at our shows and exhibitions.'

AT the annual general meeting of **WOKING & D. A.S.** the retiring chairman Mr A. Stacey thanked the retiring committee for their work in the past year. Officers elected were: chairman, Mr Lane; secretary, Mr Reid (19 Kent Road, Maybury, Woking, Surrey); treasurer, Mr Baker; show secretary, Mr Stacey. Committee: Mr Honeybell; Mr Egan, Mr Roden, Mr Forbes. Secretary Mr Reid will welcome enquiries with regard to club

IT is with deep regret that **KING'S LYNN & D. A.S.** announce the tragic death of one of their most prominent members, Mr J. A. J. (Tony) Claxton. Tony Claxton was one of the pioneer marine keepers in East Anglia, if not in England, having kept marines for 10 years. His collection included five tropical marine and one coldwater marine tank, housing many native specimens he had collected himself. He excelled not only as an aquarist; his collections of reptiles and pheasants were also greatly admired. The Society's condolences are extended to his wife and three children.

Meetings and Changes of Officers

EALING & D. A.S. Officers: chairman, Mr R. C. Miles; vice-chairman, Mr D. Carter; secretary, Mr C. Rainbow (22 Lynon Road, Chesham, Bucks; phone 0440 5 71437); treasurer, Mr A. King; show secretary, Mr R. Sellers.

FANCY GUPPY ASSOCIATION SOUTHERN ENGLAND: Meetings: first meeting to be held at 5.0 p.m. on 21st February, 1971, and afterwards on the third Sunday of each month, at the Park Centre, Burgess Hill.

KING'S LYNN & D. A.S. Meetings: The Eagle, Norfolk Street, King's Lynn, on the first Tuesday of each month at 7.30 p.m.

activities (phone Woking 65400). Meeting nights are the first and third Tuesdays of each month, 8 p.m., in the Society's private meeting room.

ALL future meetings of the **KING'S LYNN & D. A.S.** are to be held at the Eagle, Norfolk Street, King's Lynn, on the first Tuesday of each month at 7.30 p.m. Each month the meeting will include a table show (that on 6th April is for catfishes) and there are quizzes, slide shows, lectures etc. Club members continue to prove that, although small in number, they are big in will-power and endeavour, and are undertaking to provide an exhibit at the forthcoming show for local societies at the King's Lynn Corn Exchange. Following on the success of their first Marine Life Exhibition last September, the Society also have plans for a bigger and better exhibition incorporating an open show, and would be pleased to hear from clubs and companies willing to exhibit. Other societies interested in exchanging visits and taking part in inter-club shows are asked to contact show secretary Mr B. Capper, 11 Marsh Lane, Gaywood, King's Lynn, Norfolk.

AQUARISTS planning a holiday in the Torbay area are cordially invited to join **TORBAY A.S.** on their club nights—for details, please write to Mrs O. Lay, 7 Newtake Rise, Newton Abbot, Devon. The Society's successes during 1970 culminated in their achievement in gaining 104 points to win the Inter-club Challenge Shield (Torbay, 104; Plymouth, 51; Totnes, 41; Exeter Marine, 24). The Society's awards for 1970 were presented recently to the following: Mr M. Poole, the President's trophy (highest number of points in the year); Mrs Double-day, the Thompson trophy (for consistent hard work behind the scenes); Mrs Lay, the Lorraine Cup (best home furnished aquarium).

MID-SUSSEX A.S. Officers: chairman, Mr R. Johnson; vice-chairman, Mr D. Soper; secretary, Mr J. Rieve; treasurer, Mr C. West; show secretary, Mr J. Walker.

NORTH KENT A.S. Chairman, Mr P. Cottle; secretary, Mr A. C. Cox (22 Bridge Road, Slade Green, Erith, Kent); social secretary, Mr P. Wild; treasurer, Mr K. Sibley; show secretary, Mr P. Robinson.

WOKING & D. A.S. Chairman, Mr Lane; secretary, Mr Reid (19 Kent Road, Maybury, Woking, Surrey); treasurer, Mr Baker; show secretary, Mr Stacey. Meetings: First and third Tuesday of month, 8 p.m. in Society's private meeting room (please phone Mr Reid at Woking 65400 for details).

Badge of the Month



THE badge of the D.K.G. (Deutsche Killifisch Gemeinschaft) is shown above. Formed in May 1969 as the result of three friends in Frankfurt who shared an interest in killifishes thinking of the association, the D.K.G. at its inaugural meeting attracted more than 60 enthusiasts from all over Germany. Now there are 255 members in Austria, Brazil, Belgium, Canada, Denmark, Holland, Norway, South Africa, Spain, Sweden, Switzerland, U.K., U.S.A. as well as Germany. A journal is issued monthly together with a colour slide of the killifish described in the monthly information sheet. A list of fish for sale and wanted is also issued. Secretary is Herr Dieter Bormann, 62 Wiesbaden, Schützenhofstr. 15, W. Germany.

Dates for Your Diary

1st April. **THURROCK A.S.** Open Show. Thameside School, Arthur Street, Grays, Essex. Schedules: Mr D. C. M. Durrant, 22 Kingman Road, Stanford-le-Hope, Essex.

4th April. **BRITISH KILLIFISH ASSOCIATION** General Meeting. Squired Hotel, Wellington, Somerset. Details from Mr W. Davison, 2 Shaw Road, Tipton, Staffs.

4th April. **HOUGHTON & D. A.S.** Open Show. Philadelphia Welfare Hall. Benchling 10 a.m. - 1.30 p.m.

4th April. **NELSON A.S.** Open Show. Civic Centre, Stanley Street, Nelson. Schedules from Mr B. Tate, 12 Priory Close, Bingley, Yorks. BD16 6BU.

10th-12th April. **TOTTENHAM & D. A.S.** Open Show. Haringey Sports Council, Drill Hall, High Road, Tottenham, London, N.17 (opposite the Spurs Ground). Schedules: Mr B. Thornton, 3 Reymondson Court, High Road, Tottenham, N.17.

17th April. **BATH A.S.** Open Show. St Peter's Church Hall, Lower Bristol Road, Bath. Schedules available mid-February.

17th April. **G.S.G.E.** Quarterly meeting. Farnham School, Tooting, London.

17th April. **AQUARISTS' FILM SHOW** organised by **HEMEL HEMPSTEAD A.S.** and Kodak Ltd. Kodak Ltd., Maylands Avenue, Hemel Hempstead, Herts.

18th April. **MEDWAY A.S.** Open Show. St John Fisher School, Ordinance St., Chatham, Kent (1 min. Chatham Station). Schedules: Mr J. Marshall, 97 Durgess Road, Chatham, Kent: phone 63712.

18th April. **SHEFFIELD & D. A.S.** Open Show. Change! now to be held in the Technical College Gymnasium, at the corner of Leopold Street and West Street, Sheffield 1, Yorks.

24th April. **INDEPENDENT A.S.** first Open Show. Islington Town Hall. Details from Mr R. Islip, 25A Colneyhatch Lane, London, N.10.

15th April 1971. **BURY & D. A.S.** Open Show. Church House, The Wyke, Bury.

25th April. **FREELANCE A.S.** Open Show. All Saints Church Hall, Surrey Square, Waltham, London, S.E.17. Details: Mr J. E. Stamp, 79 Redman House, Lamb Street, London, S.E.1. Phone 41-427 466.

25th April. **M.A.L. League Show.** The Sports Centre, Greshy Street, Loughborough, Leics. Details from Mr M. I. Farrdon, 11 Silverton Road, Loughborough, Leics.

25th April. **STOCKTON-ON-TREES A.S.** 25th Open Show. St Peter's and Paul's School, off Durham Road (A177), Stockton-on-Trees. Schedules: Mr W. Rowman, 2 Seaton Close, Fairfield, Stockton, Teesside.

25th April. **YORK & D. A.S.** Open Show.

1st May. **HENDON & D. A.S.** Open Show. Brotherhood Hall, West Hendon, N.W.9. Schedules from Mr T. Glass, 10 Adelaide House, London, W.10.

1st May. **TROWBRIDGE & D. A. & P.S.** Open Show. Nelson Haden Girls School, Trowbridge. Show schedules mid-February from Mr C. Panny, 122 Trowbridge Road, Bradford-on-Avon, Wils.

2nd May. **ASHTON-OLYNE & D. A.S.** Open Show. The Jubilee Hall, Dukinfield, Cheshire. Schedules: Mr P. Vinton, 9 Bostock Terrace, Richmond Park Estate, Ashton-under-Lyne, Lancs.

2nd May. **CROYDON A.S.** Open Show. Stanley Hall, South Newwood Hill, S.E.25. Schedules from Mr A. J. H. Smith, 3 Hindhead Way, Wallington, Surrey.

2nd May. **DUKES A.S.** third Open Show. Winifred Portland Technical Grammar School, Sparken Hill, Workson, Notts. Show secretary, Mr M. Woodley, 26 Silverdale, Dinnington, Nr Sheffield.

9th May. **WORKSON A. & Z.S.** Open Show. North Notts College of Further Education, Carlton Road, Workson. Schedules shortly from Mr. P. G. Silson, 27 Clifton Street, Workson, Notts. Free car park; refreshments available.

9th May. **DERBY REGENT A.S.** Open Show. Sherwood Foresters Recreation Centre (Normanton Barracks), Normanton Park Road, Derby (follow R.A.C. signs). Schedules from Mr R. T. Bull, 35 Queens Drive, Littleover, Derby.

9th May. **OSRAM A.S.** Open Show. The Recreation Hall, Refuge Street, Shaw, Oldham, Lancs. Schedules: Mr J. E. Shore, 31 Refuge Street, Shaw, Oldham.

15th May. **UXBRIDGE & D. A.S.** Open Show. Meadow School, Royal Lane, Hillingdon, Uxbridge. Schedules: Mr N. V. Lee, 45 Alersdale Road, Ealing, London, W.3.

15th May. **MERSEYSIDE A.S.** Open Show.

22nd May. **SOUTHEND, LEIGH & D. A.S.** Open Show. Liberal Hall, Clarence Road, Southend (proceed towards sea from Southend Central Station, first right, first left). Details: Mr R. D. Orford, 8 Blenheim Chase, Leigh-on-Sea, Essex.

22nd May. **YEOVIL & D. A.S.** Open Show. Grass Royal Secondary School, Yeovil. Schedules from Mr A. E. Rendell, 77 Freedom Avenue, Yeovil, Somerset.

23rd May. **CORRY & D.A.S.** Open Show. Schedules from show secretary Mr D. A. Page, 78 Crispin Street, Rothwell, Northants.

23rd May. **COVENTRY POOL & AQUARIUM SOCIETY** Open Show. Foleshill Community Association, 757 Foleshill Road, Coventry.

23rd May. **LOYNE A.S.** first Open Show. Gregson Institute, Moss Lane, Lancaster. Schedules from Mrs M. Norris, 20 Wyresdale Road, Lancaster.

London's Annual Exhibition of Fishkeeping

The AQUARIUM SHOW '71

Friday 29th October to Sunday 31st October

Royal Horticultural Society's Old Hall, London S.W.1

All details from Show Organiser, PFM, 554 Garratt Lane, London S.W.17 01-947 2805

23rd May. **NORTHWICH & D. A.S.** Open Show. The Scout Hall, Cuddington, nr. Northwich. Benching 12.00-2.0 p.m. Show schedules from Mrs D. Thomas, 28 Whitegate Road, Winford, Cheshire.

29th May. **CATFORD A.S.** Open Show.

29-30th May. Sixth **INTERNATIONAL GUPPY SHOW (FANCY GUPPY ASSOCIATION)**. Globe Farm Community Centre, Stechford, Birmingham. Open to non-F.G.A. members.

3th June. **F.B.A.S.** Assembly, Conway Hall, Red Lion Square, London, W.C.1.

6th June. **LINCOLN & D.A.S.** Open Show. Drill Hall, Broadgate, Lincoln.

6th June. **ACCRINGTON A.S.** Open Show.

6th June. **BOURNEMOUTH A.S.** Open Show. Kinon Community Centre, Pithams Park, Kinon. Schedules from Mr J. Jeffery, 20 Bessmore Avenue, Southbourne, Bournemouth. 804 417, after 1st April.

6th June. **BISHOPS CLEEVE A.S.** Open Show. The Tythe Barn, Bishops Cleeve (on the A475, Cheltenham to Evesham Road). Schedules from Mrs C. F. Seyrin, 27 Warden Hill Road, Cheltenham, Glou.

12th June. **LLANTWIT MAJOR A.S.** Open Show. Town Hall, Llantwit Major.

Details from Mr A. Ibbertson, 84 St Marys Avenue, Barry, Glam.

12th June. **LOUGHBOROUGH & D.A.S.** Open Show. The Sports Centre, Greshy Street, Loughborough, Leics. Show secretary, Mr M. I. Farrdon, 11 Silverton Road, Loughborough, Leics.

13th June. **HIGH WYCOMBE A.S.** Open Show. Details from Mr. B. Leslie, 20 Meadow Walk, Tylers Green, Penn. Bucks.

20th June. **GLOSSOP A.S.** Open Show. Glossop Adult Educational Centre, Talbot Street, Glossop (A.M.E.D.A.S. Show).

20th June. **SWILLINGTON A.S.** Open Show.

24th-26th June. **BRISTOL TROPICAL FISH CLUB** Open Show. Congregational Church Hall, Newton Street (Stapleton Road), Bristol 5. Details from Mr E. Newman, 71 Somerdale Avenue, Knowle, Bristol 4.

27th June. **WEDNESBURY & D. A.S.** Open Show. Boys High School, St Paul's Road, Wednesbury (1 min. off M.6). Schedules from Mr T. Shipson, 9 Gloucester Road, Wednesbury.

27th June. **ALFRETTON & D. A.S.** Open Show. Adult Education Centre, Albion Hall, Alfretton. Details from Mr B. Hicking, 14 Meadow Close, Eastwood, Nottingham NG16 1BQ.

4th July. **LYTHAM A.S.** Open Show. Lower Gardens, Lytham, Lancs.

20th July. **G.S.G.B.** Quarterly Meeting. Conroy Hall, Red Lion Square, Holborn.

11th July. **TADCASTER & D. A.S.** Open Show. (Details to follow.)

17th July. **BASINGSTOKE & D. A.S.** Change of date. Fifteenth Open Show (formerly to be held on 10th July). Cranborne School, Cranborne Lane, part of Basingstoke. Curatorial activities. Show schedules from Mr M. Strang, 18 Loddon Court, Neville Close, Basingstoke, Hants.

18th July. **RUNCORN A.S.** first Open Show. Schedules: Mr J. Faulkner, 20 Leinster Gardens, Ramors, Cheshire.

1st August. **BLACKPOOL & FYLDE A.S.** Open Show. Details later.

15th August. **NORTH STAFFS A.S.** Open Show.

28th August. **ANSON A.S.** Open Show. St. Andrews Hall, Willenden, London Rd., N.W.10. Schedules from Mr D. Thomas, 16 Cornwall Gardens, London, N.W.10.

4th September. **F.B.A.S.** Assembly. Conway Hall, Red Lion Square, London, W.C.1. 2.30 p.m.

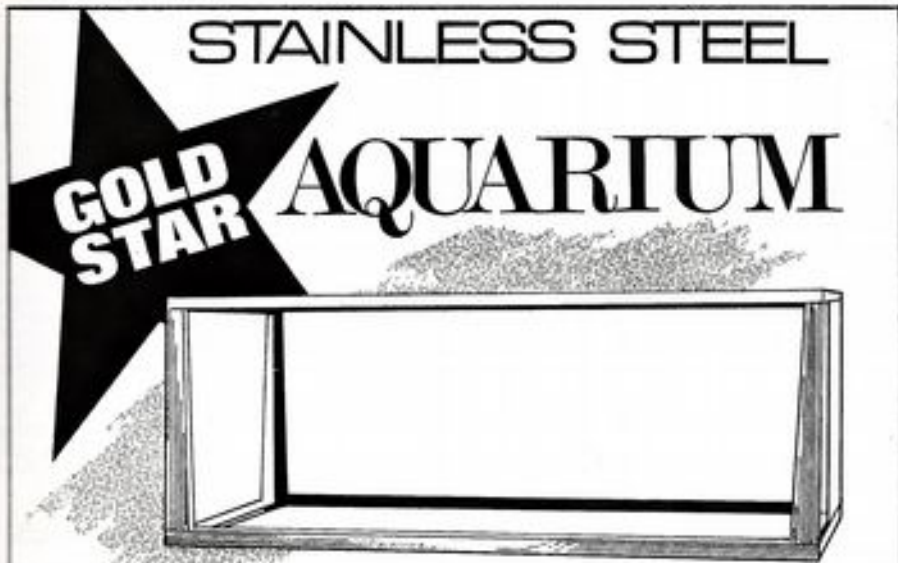
4th September. **YATE & D. A.S.** Open Show. Details awaited.

11th September. **Huddersfield T.F.S.** Open Show. The Town Hall, Huddersfield.

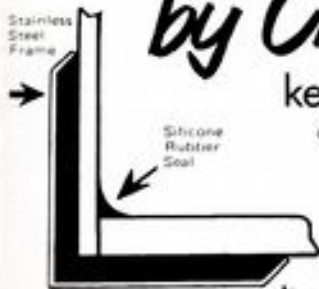
21st September. **LUCAS A. & P.S.** 1st Open Show. Joseph Lucas Ltd, Shaft Moor Lane, Birmingham. Schedules from Mr G. Roberts, 29 Charles Road, Solihull, Warks.

28th September. **HAVANT & D. A.S.** first Open Show. Deverall Hall, London, Parbrook, Hants. Details: Mr N. Davis, 20 Starwood Crescent, West Leigh, Havant, Hants.

9th September. **BRACKNELL & D. A.S.** Open Show. Pineswood Community Centre, Pineswood Court Road, Bracknell (opposite Admiral Cateringham Hotel). Schedules from Mr L. Jordan, 62 Fernbank Place Ascot, Berks.



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pygmy sword, 1/9; giant *Hygrophila*, 2/-; Indian fern, 1/3; *Blyxa*, grass plant, 1/6; red *Sessilis*, 9d. (*Cryptocoryne wendtii*, brown, 3/-; *petchii*, 2/6; *wendtii* green, *undulata*, *ciliata* broad and narrow, *beckerii*, *nevillei* normal, 2/-; *nevillei* pygmy 1/6; one of each 16/-). 20 seedling *Cryptocorynes*, 10/-, Cabomba red, green, *Ambulia*, 8d, 6/- dozen. *Vallisneria* straight, twisted, *Hygrophila*, *Elodea densa*, *Ludwigia*, *Sagittaria*, 6d, 5/- dozen. *Nitella* 2/6; giant bladderwort 2/-; hair-grass, 2/6. Plant collections (extra value) 10/-, 20/-, 40/-; postage 1/6. D. W. Smith, 20 Park Street, Kidderminster, Worcs. Phone 62601.

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BADGES. Every Society needs bright enamel badges. For best service and quality contact R. E. V. Gomm Ltd., 14-15 Frederick Street, Birmingham B1 3HE.

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Continued on page 526

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