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Comments and Quotes

Male and female mouth-brooding ●
Prolactin produces discus milk ● Chemicals and water snails

Oral Nurseries

THE most usual procedure for fishes showing mouth-breeding behaviour is for the female to keep the fertilised eggs after spawning in her mouth at least until hatching takes place. The fry are often kept there for some time after this—up to two weeks or so. One species of cichlid from Israel has, however, now been reported to mouth-breed with both sexes sharing the eggs and fry-carrying. As this behaviour differs from that previously seen in what was thought to be the same species, Tilapia galilaeus, from Lake Albert, Uganda, it looks as if the Israel ones might be another species altogether.

Another difference noted by Dr. R. Apfelbach, writing in NATURWISSENSCHAFREN, is that the Tilapia from Israel (usually considered to be the fish in Matthew 16, 27 of which it was foretold that it would be caught in Galilee with tribute money in its mouth) do not form fixed pairs that remain together after spawning as is the usual cichlid fashion. Apparently they associate only during the spawning act and then go their separate ways after this, each carrying eggs in the mouth. If these mouthbreeders from the different areas are in fact separate species which one will have to be re-named? It would seem that the Galilee cichlid has the greater claim to galilaeus as a specific name, so the African one might in due course be allocated a new title. If they are not different species this would be an interesting example of a change of breeding behaviour with geographical dispersion of the fish.

Discus Milk

COWS, coconuts, pigeons and discus fish might not seem to have much in common on first consideration—but all of them produce a milk of a sort. ‘Discus milk’, the name given to the heavy skin secretion that forms on the parent discus fish after spawning, is used as food by the young discus in their early stages. There is a much more basic link between the three animal species listed above in this matter of ‘milk’ production than is apparent, however.

Milk formation in cows and mammals generally is known to be set off by a chemical substance (a hormone) called prolactin being released from the animals’ pituitary gland. The same hormone promotes the formation of the crop fluid—‘pigeon’s milk’—used for the nurture of young pigeons in the nest, and yes, you’ve guessed it—if prolactin is injected into Symphysodon discus fish it causes the appearance of the milky skin secretion and also has been shown to have the effect of increasing the mucous cells in the skin of the brown discus fish. E. senegalensis axelrodi. The strange thing is that the prolactin formed in a mammal such as a sheep and artificially extracted from its pituitary gland
can act on the pigeon or the fish in the ways described when the extract is injected into them. The inference here is that in probactin we have a substance formed within and used widely by the vertebrates for initiation of various processes connected with the feeding of their young.

That this is not the only possible role of probactin has been shown by some investigations made in Massachusetts, U.S.A. on newts. Normally, the adults of these land-living newts enter the water only for breeding purposes, but under the influence of probactin injections they are caused to seek the water and to undergo the typical skin modifications which accompany the aquatic existence, although it is not the breeding season.

**Control of Water Snails**

RESEARCH has been going on into chemical means of killing water snails in tropical regions where these animals carry one stage in the life cycle of the blood fluke, cause of bilharzia in man. One substance acting successfully as a snail-killer has been developed by the Shell Agricultural Research Centre and tested in various tropical waters. Named Frecon (chemical name N-tritylimidophenyl), it was found to kill all the snails in a large irrigation system in Tanzania when used at a very low concentration (0.025 part per million) and fish in the water were unaffected. The fish-keeper is bound to wonder whether here is an agent he can use to rid tanks of snails when they develop pestilential numbers. If Frecon became available at least it might be a means of clearing snails from new water plants before these were transferred to snail-free tanks that one was determined to keep snail-free.

**LETTERS**

**As Black as You'd Like**

**In answer to the letter in April's FFM 'Not as black as it might be', may I add a few remarks?**

**T**hese so-called black sharks offered for sale in dealer's tanks are not so black as they could be, but this I have found can soon be put right.

One or two facts must be remembered before going ahead. Firstly, the sharks have probably been travelling recently and this will affect their colour. Secondly, they are not in their permanent home so although the best will have been done for them the water conditions will not be perfect. If one wishes to purchase a perfect specimen he must be satisfied with your requirements. Study the fish for a few moments before purchasing and ask if it would not be too much trouble for the dealer to catch the particular fish you want. The first you choose should be fairly active with a darkish hue, but may not be completely black.

An important fact is to look for a plump one. I have found that a well matured tank which shows a little algae suits their requirements best. The tank should be quite thickly planted. Temperature should be as directed in your book, which should also give you details of pH etc. Feed with a mixed diet such as dry food, white worms and daphnia, alternating about every two days. Within two weeks your red-tailed black shark should be right at home; a little bigger, but most important, showing at most times a velvet black body.

**Prize Letter**

_Labo bicolor_ my experience might help in choosing and installing one of these most attractive fish.

When buying your stock find a dealer who has a good reputation; he will be pleased to satisfy your requirements. Study the fish for a few moments before purchasing and ask if it would not be too much trouble for the dealer to catch the particular fish you want. The first you choose should be fairly active with a darkish hue, but may not be completely black. An important fact is to look for a plump one.

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**More Co-ordination Required?**

**In** this country at the present time we have a Federation of British Aquatic Societies, a Federation of Northern Aquarium Societies, a Federation of Scottish Aquarist Societies, a Federation of South Wales Aquarists' Societies, a Midlands Association of Aquatic Societies, an Association of South London Aquatic Societies, and it seems quite a few other such Associations or Federations.

Surely then the F.B.A.S. is misinformation, as in fact it is not a Federation of British Aquatic Societies but more of a 'Federation of Societies」. Taking this point even further, what about the areas which have no 'home-based' federation, e.g. the South Coast?

In addition to the above organisations we have the Goldfish Society of Great Britain, who, as well as most of the other organisations, also appoints its own judges, not to forget the Fancy Guppy Association, the Federation of Guppy Breeders Societies, the British Killifish Association, and the newly formed Marine Study Society, all of which have members all over Britain.

There seems to be no co-ordination between any or most of these bodies, demonstrated by the fact that most appointments are made by themselves, judges to their own standards, and all these are quite different in most aspects.

Surely what is lacking is not organisation (there seems to be too much of this) but co-ordinated organisation, and mutual recognition and appointment among these bodies.

This I must stipulate is purely my personal opinion, and I would like to see comments on this topic by other readers.

**London, N.39**

C. Penton

Judge, F.B.A.S.

**Those Marine Classes**

**Until this year, Newport A.S.—the Society of which I have the honour of being show secretary—has been quite unique in that it was the only Society within this area to hold an Annual Open Show, the word 'Open' being interpreted in its widest possible sense namely a show open to any aquarist, without any dis,
Prize Letters

To the writer of the letter judged by the Editor to be specially worthy among readers' letters published in each month's issue, PETFISH MONTHLY will award a prize of a well-known make of aquarium aerator (as pictured here).

PETFISH MONTHLY will be glad to have your experiences, comments, suggestions etc. in letters on any matter associated with fish-keeping. Write to the Editor, PETFISH MONTHLY, 554 Garratt Lane, London, S.W.17.

Our First Issue

I have been awaiting with interest the first edition of your new magazine PETFISH MONTHLY. So that when I received my copy I naturally examined it in fine detail. The various articles covering a large part of our hobby were both interesting and also well worth taking note of as all the writers are experts in their own particular sphere of our hobby. While I expected PETFISH to be of a high standard, I was pleasantly surprised that even my best expectations were exceeded. It is often the little things that make such a difference to the whole and in this respect the printing of the magazine is particularly to be commended.

I shall be looking forward to future editions and if the present standard is maintained I am sure that PETFISH will become a must for the aquarist.

J. V. MORRICE
London, N.8
Lecturer and Judge, F.B.A.S.

Dormancy of White Spot

I read with considerable interest Mr. Perkins' letter 'Anything New about White Spot' (PETFISH MONTHLY). I have experienced similar behaviour in my 4-ft. community tank. A heavy outbreak was cleared with quinine sulphate, but a few months later a newly introduced pair of green mollies were found to be infested after 4 days. These were treated in a separate tank with methylene blue, cured and successfully re-introduced to the 4-ft. tank. The source of the mollies was known to be 'clean'. A pair of blue acaras behaved in a similar manner, when newly introduced, although the remaining fish appear perfectly healthy, I have often discussed the 'dormant' theory with friends but no explanation is forthcoming.

May I congratulate you on your very first issue.

Darling, Surrey
M. H. ELSON
Shipment of Fishes From South America

ERIC BOWLER, well-known British fish importer, recently travelled to the Caribbean and British Guiana. Here he describes his trip and the methods used by fish-shippers in South America.

My motives in planning my trip to South America were mixed. There was a growing awareness of the need to meet our fish suppliers in that region on their own ground, to discuss matters affecting the transportation of our supplies; I wanted also to look into sources of marine tropical fishes from the central American area, and lastly although not leastly I was overdue for a holiday. I decided to make the trip a combined business and holiday one, and agreed with my friend Mr Torn Herman, who arranged to accompany me almost at the last moment, that the scheme was to start with what would be mainly a week's leave on the sunny beaches of Nassau. But this plan was upset by an unforeseen event in the shape of Hurricane Betsy.

Not only did the overcast sky, high winds and filthy beaches make visits to the coral reefs impossible, but as no flights were in operation we had to stay put unproductively for a whole week. Even the public aquarium was closed!

By the first available plane we took off for Montego Bay, Jamaica, and then motored through Ocho Rio to Kingston, looking at the rich growths of coral and gorgeous fishes in the pools on beaches of the northern side of the island on the way. From Kingston we 'island-hopped' by plane to Porto Rico, Antigua (with an overnight stay at this capital of the Leeward Islands group), Dominica, St Lucia (another overnight stay) and Trinidad. All of these islands are beautiful, with exciting coral reefs throughout the area.

We spent four days at Trinidad, where although it seems to be still in its infancy the hobby of aquarium-keeping is gaining ground. I saw about five pet shops including fishes in their stock, and one specialised in fishes only. Local species shipped from here, mainly to the U.S.A., are Plectorhinchus and Cropyphoros armatus, collected by boys who swim in the rivers wearing underwater face masks and who catch the fishes by hand. There is Government control of these exports, with a close season in which exporting stops, and it must be remembered that the fish are items on the local diet as well as sought-after specimens for aquaria!

Our last flight was to our destination, Georgetown, British Guiana, an area which is excessively hot all the year round. Some six professional shippers of fishes have their premises here, four of these being very large establishments close to the airport. Fishes collected from a very wide area by teams of boys (one exporter has about a dozen such teams working for him) are held in oil drums that have been cut in two along their length and painted with aluminium paint. About three or four hundred of these containers were in use in one establishment, all containing water specially collected in lorry tankers from clean streams. The drums are kept under cover to keep off the sun's glare.

The fishes are kept for only two or three weeks at the most in this way, batches continually being shipped out to the airport. If disease is seen to be present, treatment is applied in the holding tanks before exporting. I saw one consignment of fish ordered for South Coast Aquatic Nurseries being loaded for the trip by air to Britain, and I was impressed by the care and trouble taken. Fresh
water was used for the plastic bag transport containers, for example, not the water from the holding tanks. Rivers from which the fishes are collected look like rivers of tea, so turbid is the water, and the water is also quite acid. In the main stream temperatures are around 80°F (27°C), but reach much higher figures in the shallow pools on the savannah. Fishes are not only caught by the teams mentioned above but are also collected by them from the native Indians in remote places. Some catches spend seven to ten days being conveyed back to the exporters by canoe, being kept in square ex-petrol cans, some two hundred or so fishes in each, with regular water changes on the journey. They are not fed during this time so that water cleanliness is aided.

It is galling to realise how many exciting species are caught and rejected, so that they never reach our market, because they are not available in the numbers required to make the handling of them a commercial proposition. One of our shippers' greatest problems I found was that as they pay their teams of collectors for fishes whatever the types brought in, at times of abundance of some two or three species the fishermen are apt to get greatly overstocked with these because they are the ones most easily caught.

Numbers of fishes available fluctuate very much in seasons, and also the handling problems may vary. For example, in the dry season with the reduced water flow the acidity of the water increases, and the fishes are much more susceptible to risks of changes of water at the holding stations.

Shipping to Britain until recently was done from Trinidad, so that the fish had first to be flown there from Georgetown, but now the air lines have arranged a direct weekly run from Georgetown through Trinidad and Bermuda to London, with a total travelling time of less than 24 hours. Not only Britain's South American fish supplies come through this channel but also those for Europe generally come through London. With this improved service more South American fishes are reaching us than ever before.

After our discussions at Georgetown were complete we flew to Miami (with an overnight stop at Trinidad). Miami is the main U.S.A. centre for imported South American fishes, which are distributed from there throughout the U.S.A., although California is now also being served direct from British Guiana.

In the Miami area there are about eighty professional fish farms, all very large. Conditions there lend themselves to this activity very well, for easily tapped subterranean water supplies are available for constant circulation through the ponds and tanks of the fish farms all the year round at 75°F (24°C). The water is, however, quite hard.

Breeding and hatching of a wide variety of species is undertaken on these farms as well as the distribution of the imported fishes. Very large livebearers are produced in outdoor ponds by putting a batch of females and males in a pond and completely emptying it to collect the 'harvest' after five months. The stock is then moved to concrete tanks for grading.

At Tampa I visited a friend, Mr A. Greenberg, collector of fishes and leading authority in the U.S.A. on water plants, to see the marvellous 'botanical garden' of his own making. His 80-acre aquatic plant and tropical fish farm (Everglades Aquatic Nurseries) was
the first one established in Florida, over 30 years ago, and to illustrate how very well liked Mr Greenberg is, it can be mentioned that all his staff with the exception of one or two have been working for him since the farm opened. Most of his staff were teenagers when they first joined him! Two very enjoyable days were spent with Al, as Mr Greenberg is known to his friends, staying in the guest house that he has specially provided for the constant stream of visitors he receives from all over the world.

There are at least 60 retail pet and tropical fish shops in Miami. These are large premises, of proportions reminiscent of our supermarkets, although their display space is used quite generously. Size of the fishes offered for sale is much greater than that of similar fishes on sale in Britain, although this is probably the result of the extreme local competition for business in an area such a Miami. Coloured gravel was very much in evidence in the display tanks, and plastic plants of realistic appearance were also apparently very popular.

Our last visit was to New York, where we looked at several of the larger retailers of tropical fishes. Here again the coloured gravel and plastic plant décor was being used. Prices were difficult to compare with those in Britain, but the impression gained was that they are generally higher.

With all the business part of my trip completed, although feeling it had all been most worthwhile, I began to wonder what had happened to my holiday plans, up to at the outset by the hurricane. Determined to make the last part of my holiday pure relaxation, and thinking that little could interfere with the carrying out of the bright idea suggested to me in New York of flying back home overnight in a plane that provided a cinema show, I spent nearly a whole day altering the return flight arrangements with this aim. The plane was delayed nearly two hours at take-off and by the time we were airborne the film had started. I was fighting to keep my eyes open and focussed on the screen.

Once again my plans for relaxation had been foiled, but in retrospect the whole five weeks had actually given me all the holiday I needed, despite the fact that I had spent almost no time away from fishes and the problems of their importers!

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**PetFish Photo Tip**

**The problem:** when a large and well-established water plant has to be moved and re-planted what do you do about its roots? Such a plant is the Amazon sword plant shown in picture no. 1 (right). In a year its roots had spread in a radius of 9 inches. To dispose of them again naturally is impossible and to attempt to do so would damage them.

**The solution:** the roots are gently bunched together and then loosely circled around one finger (picture no. 2, below). Then, with the roots still held looped around the finger they can be pushed beneath the gravel (picture no. 3, below right). When the finger is slipped out of the loop it has formed the gravel taking its place in the loop should hold the roots and the plant anchored. The roots should be pushed quite deeply into the gravel and the plant subsequently raised so that the origins of the leaf stems are just above the gravel's surface.

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**How to replant an established aquatic having very long roots**

1. 
2. 
3.
DISEASES OF AQUARIUM FISHES: Part Two

Modern Treatment of Disease

By Dr WILLIAM M. STOKOE, B.Sc., M.R.C.V.S.
(Department of Veterinary Anatomy, University of Edinburgh)

UNTIL the introduction of modern drugs such as the sulphur compounds (sulphonamide drugs) and the antibiotics, few bacterial and viral conditions of fish could be treated successfully. Today the position has radically altered and since treatment of such diseases now follows principally the same lines, it is convenient that a brief survey of the pharmacology of aquarium fishes be considered before dealing with specific infections.

Sulphanilamide, sulphadiazine and sulphanilamidine, for instance, are probably the most efficacious of the sulphonamides when used in doses of 10-15 grams per 100 litres (22 gallons) of aquarium water. Fishes are well able to withstand such concentrations but if eventual toxic reactions resulting in kidney damage, anaemia and leukopenia (a decrease in numbers of white blood cells) are to be avoided, treatment should be limited to three days, followed by a complete change of water.

Amongst the antibiotics, penicillin is probably the least efficient in the aquarium, for the majority of bacteria pathogenic to fish are of the type described as Gram-negative, on which penicillin has least effect. At the same time, penicillin is destroyed comparatively rapidly in aquarium water.

Aureomycin and terramycin on the other hand, are as effective as any of the ‘wide-spectrum antibiotics’ but they have the disadvantage of staining the water after several days have elapsed, thus giving rise to the need for at least a partial change. Aureomycin has the added disadvantage, too, in that though prolonged use may accelerate growth rate and accentuate skin coloration, it eventually leads to a loss of fertility amongst treated stock.

Chloromycetin, bacitracin and polymyxin, however, have none of these flaws and, indeed, if given in the doses and combinations recommended in the Table, they have on occasions been known to be effective against fungus as well as Ichthyophthirius (white spot) and other protozoan infections.

Common Bacterial Diseases

Garamaris. Since it was first described in 1922, garamaris disease has been known by a variety of names. By virtue of its so often attacking the genus Malacanthus, it has been referred to as ‘black mellic disease’. Others have called it ‘cotton wool disease’, and since it is characterised by the formation of a fungus-like slime, it is still wrongly known as ‘mouth fungus’.

Garamar was the first to isolate the causal organism in 1942, and recognise it as the highly contagious slime bacterium Chondrobacter garamar. For this reason therefore it is much preferable that the disease be known as ‘garamar’. The onset of garamar—which gains entrance to the host through injury—may be slow and insidious, often recognisable only by anaemia (loss of appetite), and the surface hugging of newly imported fishes in well-oxygenated tanks. Thereafter the disease manifests itself more emphatically, with the appearance of fungus-like growths resembling white cotton tufts around the cheeks and mouth of affected fish. Often the lips may become swollen and macerated and, if left unchecked, the

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dose</th>
<th>Repeat of dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloromycetin</td>
<td>250 mg. per gallon</td>
<td>Every 24 hours</td>
</tr>
<tr>
<td>Polymyxin</td>
<td>250 mg. per gallon</td>
<td>Every 12 hours</td>
</tr>
<tr>
<td>Bacitracin</td>
<td>250 mg. per gallon</td>
<td>Every 12 hours</td>
</tr>
<tr>
<td>Chloromycetin</td>
<td>250 mg. of each per</td>
<td>No repeat treatment necessary</td>
</tr>
<tr>
<td>Neomycin</td>
<td>2 gallons</td>
<td></td>
</tr>
<tr>
<td>Chloromycetin</td>
<td>250 mg. of each per</td>
<td>No repeat treatment necessary</td>
</tr>
<tr>
<td>Penicillin</td>
<td>3 gallons</td>
<td></td>
</tr>
<tr>
<td>Streptomycin</td>
<td></td>
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</tr>
</tbody>
</table>

- Antibiotics are supplied only on prescription from a medical or veterinary practitioner. Consultation with a veterinary surgeon will ensure that the correct preparation and dose are obtained.
disease rapidly progresses to the stage when the whole of the frontal area of the skull is eroded away, whereupon death soon supervenes.

Fortunately, the disease can be readily arrested by early dosage with chloramphenicol. Alternatively, swabbing the affected areas with Lilly's tincture of morpholine can prove equally effective, though thorough disinfection of tanks and quarantine of suspect fish must follow to avoid subsequent secondary outbreak.

Fin congestion and tail rot. Freshwater or marine fishes maintained for long periods in sub-healthy aquaria are prone to develop bacterial fin rot, particularly of the caudal fin or tail. The causal organism is a Gram-negative, non-spore-forming bacillus having many shapes, though secondary infections of fungus frequently occur. Highly pigmented fishes such as black mollies seem most susceptible to the disease, and affected fish usually die on the third day after its onset.

Damage to the skin, involving loss of scales, is the usual mode of entry of the bacillus, for the symptoms involve inflammation of the scale pockets, loss of scales, ulceration and eventual septicaemia and death.

In its early stages the disease can be contained by improving aeration and general aquarium conditions and by adding either Alloxid (1 gram to 10 litres or 2 gallons of water) or tryptophalin (1 gram to 100 litres or 22 gallons of water) to the infected tanks. Alternatively, the disease has been successfully treated by the addition of 15,000 units of penicillin per gallon.

If after 48 hours no complete recovery is attained, however, surgical treatment should then be applied. This consists of removing the affected portions of tail or fin with scissors. The incisions must be taken through the immediate healthy zone of the tail or fin to ensure that all the affected zones are eradicated, and thereafter the wounds should be dabbed with 1/2 silver nitrates, followed by a 1% potassium dichromate solution.

Other than that, regardless of the general treatment, even if it should prove successful, it should be continued for at least seven days after all signs of the disease have disappeared to avoid sporadic recurrence.

**NEXT MONTH:**

Other bacterial diseases.

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**Gravid Mollies**

A female mollie that I bought recently for breeding purposes quickly produced fry, all of which appeared to be dead at birth. Is it likely that this non-reproductive molly is gravid?

The fry were born prematurely. It is possible that the female mollie is structurally imperfect but most likely the premature births were caused because the female was moved from one tank to another too near the time of birth. Mollies dislike being disturbed in this way and the female should be placed in a spacious breeding trap or, better, in a planted tank on her own, as soon as it appears that she is gravid.

**Cichlid Feeding**

I have recently acquired a large Oscar which will eat nothing but gentles. Is this food providing it with sufficient nourishment? It is extremely inconvenient having to obtain the gentles in any case, and I understand that it could be eating pieces of meat and garden worms.

Large cichlids will usually take small pieces of meat, liver and garden worms, but if they develop a marked preference for one food it is sometimes not easy to persuade them to try another. However, you may well find that if the Oscar's usual food is withheld for a few days it will be more than willing to eat anything that is offered to it. The gentles are apparently being fed in sufficient numbers to provide the fish with nourishment for otherwise it would be unwilling to try another food.

**Indian Fern**

Can you give me some advice on growing Indian fern? I have no success with this plant at all.

Indian fern can be a difficult plant to get established from small specimens. If you buy small plants allow them to float on the water surface until root growth occurs and the spread of leaves is three to four inches across. The roots can then be planted in the gravel but care must be taken that the bases of the stems are well above the compost to avoid rotting. Planting in a small pot containing a nourishing medium such as two parts of soil to one part each of gravel and peat (the top being layered with coarse gravel and the whole hidden behind a rock) is recommended for this plant. It prefers soft, slightly acid water (pH 6.8-7.0) and grows exceptionally well in diffuse natural light; under shaded greenhouse conditions in summer it really thrives, but this does not mean that the artificial lighting in an aquarium will not suit it if other conditions are to its liking.

**Brackish Tank**

I have a 24 in. by 12 in. by 15 in. well-planted community tank containing swords, roses, mollies and red-finned sharks which I have had for a year, and I would like to start a second tank now. I want something perhaps a bit more adventurous and different. Have you any suggestions?

Starting a full-scale marine tank might be a little too adventurous at this stage—but a tank prepared for fish that prefer brackish water could make a pleasant contrast to your planted tank. A sea salt content of four teaspoons per gallon of water would be suitable for Malayans, sebae, humpback bee and puffball fish. Instead of plants (though the fish themselves should get a ration of duckweed and epipodium to make up the deficiency) a most pleasing effect can be obtained with rock work selected for the graining, coral and sea fans,
Tropical Fishes of the Genus Barilius

MENTION of the genus Barilius is very rare in aquarium literature, for the reason that the fishes of this group do not take kindly to capture, transport or confinement in the usual static tank. They are usually found in fast-flowing, well-oxygenated and rather cool streams—very much like the places in which we would expect to find trout. Indeed, these fishes, although belonging to the family Cyprinidae, the great carp family, are often not unlike trout in general appearance; perhaps they occupy a similar ecological niche in areas where trout do not occur. But although some of the Indian species grow large enough to be regarded as sport-fishes, they do not reach the size of trout, and are often to be found in shoals.

In the old German reference book, *Fremdländische Siamesenfische* by Arnold and Abi, the Japanese *Barilius neglectus* was included as an aquarium fish, and this is the only species that has been kept with any success since that time, and the only one to have been bred. In the recent *Freshwater Fishes of the World*, by Günther Sterba, an African species, *B. christyi*, is included. That is all that fish-hobbyists have heard of the genus until now.

It is difficult to assess exactly how many species of Barilius actually exist; perhaps about fifty. These are to be found in Africa, India and southern Asia eastward to Japan; but none occurs in Malaysia or the Indonesian islands.

As might be expected, fishes from fast-moving waters require plenty of room and either constant circulation or aeration strong enough to maintain a current. They do not require such high temperatures as fishes from swamps and pools, neither must the water be as soft or acid. Success will more likely be achieved with most of them by providing rather hard, slightly alkaline conditions.

It would, however, be foolhardy to lay down hard and fast rules for keeping any species of Barilius, as so few have been seen in captivity.

General Features

Specimens of *B. christyi*, from the Congo, were kept in circulated, slightly alkaline water at the Van Kleef Aquarium in Singapore, and over a period of about three years they reached a length of 6 inches. They were not observed to spawn, although had they done so the conditions in a public exhibition would have made the chances of survival of eggs and young very unlikely.

In shape, the body of the various Barilius species may range from something very like a *Danio* to the more elongate form of a trout alivin. The mouth is rather large and seems to increase in size with age. The dorsal and anal fins are about the same size, but in some species (e.g. *B. christyi* and *B. neglectus*) the dorsal fin is placed above the anal, in others (e.g. *B. ornatus*) the dorsal fin is farther forward. The lateral line passes along the lower side of the tail; in some species it is complete, in others incomplete.

A common colour pattern is a series of cross-bars or
blotches, very reminiscent of those of young trout, but in some species these are absent or there may even be a stripe along the side.

**Species mentioned:**
- *Barbus ornatus* Sauvage 1883
- *Barbus neglectus* Steieler 1967
- *Barbus kirsty* Boulegger 1926

Although we have not noticed any special difficulties about the keeping of the rainbow barb under ordinary aquarium conditions it has been observed that they become very agitated if a strong light reaches the tank from the side. Such illumination does reveal the beauty of the gentle colours of this fish, but in an aquarium opposite a window from which the afternoon sun reached them the fish showed great distress. Their intolerance of poorly oxygenated water was shown when two specimens were moved into a small tank for photographic purposes. The tank had been used for two much larger fish just before this, and the rainbow barb very soon began to swim erratically; one died after about ten minutes. The other one recovered immediately when it was returned to the aquarium with the batch from which it had been taken.—*Zeetor.*

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**Is it**

**New**

**to**

**You?**

*Photo: LARRY STIMSON*

**AN unusual tropical from South America now being imported is the arowana (Osteoglossum bicirrhosum). At first glance it is the elongated, tapering and almost strap-like body with its long anal and dorsal fins that draws attention, but one of the fish's most unusual features is the forked pair of dark-coloured barbels held out prominently in front of the lower jaw, and these, in conjunction with the large trap-like mouth and big gold-rimmed eyes soon excite one's interest. Markings of the arowana are attractive, too. The large pectorals, held out like butterfly's wings, have conspicuous black rays. Although body colour is an even olive-green, it is relieved by a dark occelot just above the pectorals that has a gold crescent behind it.**

The aquarium specimens generally available are about 3 inches in length but these are in fact mere babies, and some of them we have seen in importer's tanks (Chiswick Aquaria, London and Finsday Aquaria, Birmingham) have had the orange-coloured yolk-sac still present. Just how big they will grow is a matter of conjecture, as lengths from three to nine feet have been mentioned by various sources. Mr J. Goodman of Chiswick Aquaria has an arowana about 10 inches long which displays the large and prominent scales that are characteristic in this species and others of its group. Growth is said to be rapid in spacious living conditions and with good feeding. The youngsters, although shy at first, will take small fishes such as livebearer fry, also water fleas and aquatic larvae.

**ALTHOUGH so far we have seen only one specimen (at Keith Barraclough, Bradford) the presence of the eyespot cichlid (Cichlasoma ocellare) among importations is worth mentioning as an example of the hitherto unseen fish from South America that are now reaching us. This one is strictly for the cichlid specialist prepared to go to great trouble to cope with its large appetite and space requirements. The fish seen was 10 inches long and showed an unusual feature for this group in the two-part dorsal fin. A colourful cichlid, the 'eyespots' of its name being present on the caudal fin.*
Pond Plants to Try
Out this Year

By Dr W. E. SHEWELL-COOPER

WATER salvia (Syriathea aloides) is one of the most unusual plants to grow, with long tapering serrated leaves, plus flowers, and it will either grow floating on the surface of the water, or it can be attached to the bottom of the pool, or even the aquarium. Give the plant plenty of room to spread and it may easily be a foot in diameter. I always think the flowers look like cactus dahlias. Unfortunately they float just under the surface of the water. The colours, curiously enough, vary with age and environment. On the whole it is better not to plant a water salvia but just drop it in the water and it will find its own root-hold.

Bladderwort (Utricularia vulgaris) is not on the whole easy to obtain (I only hope some nurseryman who sees this will write and tell me that he has got plenty of plants!). This floating aquatic is insectivorous. It has large bladders which attract the water fleas and such like and then digest them to assist in its own growth. Its leaves are thin and hair-like, and tiny yellow flowers are produced well above the surface of the water. It is quite a useful thing to have as an oxygenator, not only in a pool but in an aquarium too.

It is rather fun to try to grow a submersed aquatic that is edible—water cress, for instance, which is a quite good oxygenator in fact. Ranunculus aquatilis aquatics will not grow, however, unless it has some running water, and it is better, too, if the pool is shallow. Water cress spreads very much and becomes a nuisance in time, and that is the reason why it has lost its popularity in gardens. Furthermore, it has not any flower.

Far prettier are the various bog and aquatic members of the buttercup family. A submerged aquatic is water crowfoot (Ranunculus aquatilis) with leaves divided into hair-like segments and having upper leaves that are three-lobed and floating. Its flowers are white with yellow stamens.

Fair Maids

A plant to grow near the water, or even just in a shallow pool, is Ranunculus lingua. This has undivided leaves and branching stems carrying the typical yellow flowers. The petals are like shining brass and they usually look magnificent from July right through to the third week of September. There is a variety, grandiflorus, which is even more magnificent, although usually a little more expensive to buy. For the waterside I am going to recommend Ranunculus aconitifolius, variety flore pleno. This is sometimes called the fair maids of France, or perhaps more rightly, the fair maids of Kent. It produces beautiful double white flowers and dark green leaves which I always think are palm-like. Most species of the pondweeds are a nuisance, but one or two of them are fairly suitable for pools as oxygenators. Potamogeton pectinatus is often called the fennel-leaved pondweed because its leaves are almost hair-like and it produces much branched stems and foliage. I like it because it gives good cover for small fish in the breeding season. The slender pondweed P. paillus, if you can get it, is another you might try; it has thread-like leaves and stems, plus brownish flowers which are borne just above or just below the surface of the water.

New Books

Aquarium Techniques

1: Care and Equipment (190 pages). 2: Fishes and Plants (264 pages) by A. O. Janse.


These two volumes form excellent beginner's guides to aquarium-keeping and will interest especially the do-it-yourself type of aquarist (although for some unexplained reason he will find himself referred to as an aquarist in Mr Janse's books). Thus in volume 1 detailed instructions for tank-making, arranging lighting and aquarium supports are given along with some suggestions for home-made air pumps. Setting up, foods, pests and diseases are also the province of this volume. Both coldwater and tropical aquaria and their inmates are covered, fishes and plants forming the topics of volume 2, which carries the subject index for both volumes. The books are attractively presented and the illustrations of equipment are specially well done.

Anthony Evans
PETFISH MONTHLY visits

Mr B. Bell at Home

Spring was very much in the air the day I made my visit to Mr B. Bell’s home at Chessington, Surrey, and I found him hard at work clearing an overgrown plot of land for potato planting. Mr Bell, ‘Bernie’ to his many fish-keeping friends and acquaintances, is chairman of Clapham Aquarists Society, in whose area he lived until recently. He told me how his removal involved dismantling the fish house he maintained at his old address, and how with a garden to restore and the work of adapting his house for his family he had been forced to become merely a ‘two-tank man’. But don’t let that mislead you—one tank in his lounge is six feet long and the other one (a tank or a raised pond, according to your view) in the garden is 12 feet by 30 inches by 30 inches.

The joining up of two rooms by removal of the partition wall left a convenient space between two chimney breasts into which Mr Bell has installed his large tropical aquarium. It meets the eye as soon as the room is entered, and is a pleasing feature to view from any part of the room. Overhead fluorescent lights for the aquarium are concealed beneath a hinged ‘lean-to’ type cover that can be lifted up and held open by cords.

Some large specimen fishes form prominent members of this tank’s community, largest being a giant gourami (Ophiogobiont gourami) that spends most of its time at one end of the tank with a large black shark (Morulae chrysaipheilion), each of these fishes showing marked individual animosities: the gourami towards a brown acara, a Plecostomus who lives mainly under an arch of rock being chased from time to time by the shark. Tinfoil barbs, blue acaras, mollies and swordtails are amongst other fishes included in this lively display.

Undergravel filtration is used, with air flow from a piston pump under the cover, and in addition two or three times a week a home-made circulating system incorporating a filter is switched on for about an hour. An ex-washing machine pump, driven by a tenth horsepower motor and concealed together with the filter in a cupboard beneath the tank, provides a powerful delivery that swirls heavier sediment towards the siphon outflow at the other end of the aquarium. The filter was made from an old pressure cooker and is packed with glass wool. When I was being shown this system in operation.
Mrs Bell laughingly said, "There'll be some other homes with floods in their living rooms if you pass on the details of that!". However, Bernie assured me that this had happened only when the pump had not remained primed with water as it should do, so that the outflow caused the filter to fill up and overflow. By means of a cock on the siphon the outflow is normally adjusted to keep pace with the return flow.

Mr Bell mentioned that poor plant growth was a problem he had met for the first time since setting up this tank, but with large fishes and plant-nibblers such as the gourami and the tin-foils, Amazon sword plants are about the only ones that get a chance to make headway.

In his rear garden, which slopes upwards away from the house, Mr Bell has designed and constructed a special coldwater aquarium. Built of bricks faced with concrete, the rear wall of this tank also serves to retain a levelled patch of lawn that incorporates a shallow pond at its far end. In the front wall of the tank is fitted a long panel of glass (three-quarters of an inch thick) and the wall is faced with attractively coloured roughcast bricks.

Goldfish, shubunkins, mirror carp, gudgeon, tench and some very fine large dace live in the tank, and some of Mr Bell’s angling friends have promised to help him add to the collection. Plants for the upper surround of the tank, which is made with a trough for earth, and for another planting trough on the sill of the viewing panel, will add to the attraction of this garden feature as they make growth.

Mr Bell is an active participant in inter-club shows, at which he has gained many awards, including a medalion from Riverside A.S. for breeding Corydoras paleatus. In the fish house he used to maintain he also regularly bred angels, fighters, cherry barbs, white cloud mountain minnows, zebraz, thick-lip and opaline gouramis, blue acara and livebearers, but at the expense of spare time that he can no longer give. Even so, he hopes to breed shubunkins in the garden this year.

He has combined his other hobby of cine photography with his aquatic interests by making films of his fishes and also of other club-members’ home aquaria. Mr Bell uses an 8 mm. Cronica camera with a f 1/8 zoom lens, and he let me see one colour film that he has shown to several South London societies. He said that he is willing to loan this to clubs planning film shows, although it is best appreciated if seen together with his personal commentary on the community tanks, angel and fighter breeding shots and big fish sequences that it includes.

As an amateur film-maker Mr Bell was specially delighted when some of his large tropical fishes were borrowed to stock tanks used for a T.V. film made for "The Avengers" series last year, so if you are a devotee of Steed and Emma Peel you have probably already had a glimpse of his ‘big chops’ on your home screens.

Anthony Evans
Plastic or Concrete?

Durable ponds can be made from moulded fibre-glass, liners of modern toughened plastic sheet or of concrete. Now that ready-mixed concrete deliveries take much of the hard work out of concrete pond-making, use of the old time-proved medium is becoming popular again.

It is now six years since I was bold enough to be the first person in this country to offer plastic sheet to the public specifically for the purpose of making a pond. Many years of experience before this in making ponds from concrete, makes me feel qualified to discuss the relative merits and disadvantages of both methods of pond-making. As many readers may be contemplating pond-making this year, I propose to deal in detail with both concrete and plastic ponds.

Concrete, which had been used for many years, went out of fashion because of the ease and relative cheapness of using plastic sheet. After a few years polythene sheet ponds suffered a set-back because of the relative ease with which they could be holes. Very much tougher PVC and Terylene-reinforced PVC sheet (Plastalene) were then introduced; although infinitely tougher than polythene, and producing a more permanent pond, they are very much more expensive. There are also ready-made fibre-glass ponds.

It is doubtful if we have much more to learn about concrete ponds. Difficulties met were the hard work involved in mixing the necessary concrete, and the problem of completing the operation in one day, desirable to prevent cracks appearing later. However, most areas now have contractors who will deliver ready-mixed concrete to your front door and this has redressed the balance.

It is now only necessary to wheel-barrow the ready-mixed concrete to your excavation and the job can be completed in a morning, especially if you have a friend or neighbour to help you. The cost of this ready-mixed concrete is little more than that of buying the separate materials yourself, and you are spared the unbelievably hard work of making concrete. Locally we are charged 77s 6d per cubic yard delivered. One cubic yard equals 27 cubic feet, which is quite a lot of concrete.

Two cubic yards will make the pond described here.

By N. H. BENNETT

Sectional views of the length (A) and width (B) of an ideal pond made in concrete or in plastic. Suggested dimensions: length, 10 ft.; width, 6 ft. 6 in.; centre section, 4 ft. by 2 ft. 6 in. and 2 ft. deep; soil margins, 18 in. wide and 9 in. deep.

The marginal soil area is retained by a line of bricks and edged with natural stone.
with some to spare. This allows for a 6 inch thickness of concrete on the bottom and sides. Before attempting to make this pond please realise that the hole must be dug 6 inches deeper and one foot longer and wider than the plan shows to allow for the space occupied by the concrete.

For simplicity this pond is shown as rectangular, but it would be preferable to use this basic rectangle and introduce irregularity into the outline. I would also prefer the centre section to be 2 ft. deep and the shelves 9 in. instead of 6 in. Shallow ponds are desirable where there are children, and ponds are highly undesirable where there are young children. After this warning with regard to the danger of all ponds to children it is perhaps as well to point out that a 2 ft depth of water is needed in the winter for fish in all parts of the British Isles except the south and south-west, where 18 inches depth is sufficient.

The pond in the diagram is essentially saucer-shaped. With this shape it is possible to line the hole in the ground without the use of shuttering (boards) to keep the concrete in position. Shuttering is expensive both in time and money. Although many older instructions for pond-making recommend shuttering, I consider it unnecessary and undesirable. Sloping sides are far less susceptible to frost damage and far easier to produce. Many people shun concrete for pond-making for fear of possible cracks developing, causing loss of water. Many cracks in concrete ponds can be avoided if these points are taken note of when constructing: a 6 in. thickness at the bottom should be aimed at. The concrete must be laid on fully consolidated ground. If this is in doubt bang in hard core with a sledge hammer before concreting. It is best to complete the laying of the concrete in one day as the joint between one day’s work and the next may at a later date part company. The rough concrete should be faced within three days with a mixture of three parts of sand to one part of cement. I have never found it necessary to use water-proofing powder in this facing.

There are good pond-sealing products on the market for concrete ponds which are sound but merely cracked. Let us hope that you will not need to use them. In hot weather it is desirable to cover the fresh concrete with wet sacks; if it rains twelve hours after facing so much the better. Nature can be imitated here with a garden hose.

The pond should be filled completely seven days after being made. There is little doubt about the toxic qualities of the water when the newly made concrete pond is first filled. Any worm or frog that makes its way into the pond will be found dead. However, when this water is removed and the pond re-filled, after at least a week it will be found that most of the toxic lime has been removed and that the water in the pond is safe for plant life. After a further week with a fresh lot of water, I find that the pond is certainly safe for fish after it is filled a second time. It is as well to put only one fish in it at first and leave this a week or two before risking more. I cannot help feeling that the problem of the toxic effect of new concrete on fish is greatly exaggerated, although the first filling certainly results in very poisoned water.

If after introducing fish to a new concrete pond it is suspected that lime is coming from the cement, the water can always be rendered non-toxic by draining and re-filling. Even leaving the garden hose running in the pond for a few hours and allowing it to overflow will dilute any pollution.

The submersible electric water pumps on the market are a great help in emptying ponds where there is no lower level to make siphoning over night with a garden hose possible. For the fish breeder and show exhibitor pumps are a great asset, as many hours can be saved catching fish by draining the pond and picking up your prize specimens when they are in shallow water.

However you make your pond great care must be taken to get the pond edges at the same height with a spirit level. When filled with water it immediately becomes apparent if the edges are not level. A high tide effect at one end of the pond and a low tide effect at the other is most undesirable, although certainly it does not look so bad with concrete as it does when a great expanse of blue plastic shows as a result.

Fibre-glass and Plastic

Fibre-glass ponds are very good, but very expensive. They are frost-proof, virtually everlasting and completely trouble-free. They look large on the roof of a car, but small when in the ground. They are not as easy to install as a plastic sheet pond, as one has to dig a hole to fit the weird and wonderful shapes in which they are produced.

Plastic sheeting moulds itself to the shape of the hole you happen to dig. If the pond is properly made the plastic sheet does not show at all when the pond is established. It is cheaper than fibre-glass, although the most expensive plastic sheeting costs about the same as concrete, allowing for the extra labour involved with concrete.

All plastic ponds are proofed against damage by frosts. The colour of the plastic sheet is immaterial.

A very easy and effective way of concealing and protecting the plastic sheet around the pond edges is by covering the margins with soil and gravel. Overhanging edging stones are not effective in completely hiding the plastic, and overhanging stones have a habit of tipping in and puncturing the plastic sheet.

You have been given the pros and cons of concrete versus plastic sheeting. What is my preference? I am about to install a fairly large decorative pond with a fountain as a permanent decorative feature near my main entrance gate. I have not yet made up my mind but I suspect that it will be just as easy and really permanent in ready-mixed concrete. It may, however, come to be made of Plastolene!

Are You an Amateur Photographer?

YOU will want to see the details of PETFISH MONTHLY’S Photographic Competition on page 59 of this issue.
LIKE some monstrous gaping mouth the bonnet of the Plymouth car clanged shut. "Let's go!" said my friend Dave Stimson, and with a roar we sped north along Highway 64.

No alarm clock had been needed to rouse me that morning; even the larks were caught rubbing the sleep from their eyes, and as I sunk back into the comfort of the car seat even the witty conversation of my travelling companions, Dot and Larry, didn't stop the thrill of anticipation as I thought of where we were heading: we were about to blow into the 'Windy City'—Chicago!

Mention that word to the average Englishman and he immediately conjures up visions of gangsters, bootleg whiskey and the 'roaring Twenties'. Sprawled between the Illinois prairie on the one hand and the vast expanse of Lake Michigan on the other, Chicago is typical of the American Middle West. Nestling as it does on the shores of the Lake, it wasn't the least bit what I had imagined, and the 'Indian summer' sunshine gave it more the appearance of a south-coast British seaside resort.

Approaching the outskirts we saw every indication that this was the largest rail centre in the world, mile after mile of stockyards and oil installations, but nearing the city proper these soon gave way to well laid-out gardens, broad highways and the hallmark of every

Chicago's Shedd Aquarium is situated on the shore of Lake Michigan. Take London's Albert Hall, fill it with fish tanks and there you have the Shedd... says the author.
Western Welcome
By Jim Kelly

successful U.S. town, the skyscraper, the latter forming a skyline that is famous the world over.

Our hosts for this three day visit were to be those familiar figures in Lakeside fishy circles, my namesake's 'the Kellys', Tom and Madelaine, and it was Tom who introduced me to the gathering of aquarists from surrounding clubs at my lecture that evening.

Introductions over, I swung into my 'spiel', hoping that my coarse Lancs. accent would be understood. As the slides flashed on to the screen I tried to tell my audience about fish-keeping in the Old World . . . Then it happened! The city of Chicago decided to show me from whence stemmed its title the Windy City.

On the journey up we had heard repeated tornado warnings on the radio, but as the weather seemed no different from that back home I hadn't paid much attention to them. But this was no north of England storm; the rain came down in sheets and the room was continually lit by lightning flashes, so brilliant that they outshone the slides; trying to make myself heard above the din, I wondered whether the ghosts of those old-time gangsters had taken to re-enacting their scenes of violence!

It all ceased just as quickly as it started and I knuckled down to the questions from my audience: 'What is the most popular fish kept in Britain?,' 'Are aquarium plants just as dear?,' 'What do you mean by gravel?'—they came thick and fast. The curiosity to learn from others was amazing and it wasn't idle curiosity either but a genuine attempt to learn more about the hobby in Great Britain. Very much later we left them still discussing things and retired to have a last late look at the city in the arms of darkness.

My limited itinerary allowed me but two visits to aquatic shops in the city: Aquatic Gardens and John Rudack's well-known Guppy Room.

At the former we saw tanks full of fishes that would have made the British hobbyist drool—red devils, discus fish the size of saucers, and, oh, those marine species!

First to catch the eye on entering most stores is the vast array of equipment on sale: pumps powerful enough to blow the roof off any fish house and at prices by our standards that would blow the cobwebs out of your wallet.

Stainless steel and all-glass tanks are the order of the day, and though some shops do have the tier upon tier display, most prefer the step-down system of placing their tanks; come to think of it, I don't remember seeing any of our familiar angle-iron tanks anywhere.

Prices were high but the stainless-steel tanks were still cheaper than in this country, and to offset the high prices I learned that wages were about three times the national average for Britain.

Here I was introduced to Gro-Lux lighting; this type of fluorescent tube imparts a 'redness' to the tank and its occupants that has to be seen to be believed.

Archer Avenue is the home of John Rudack's 'House of Tropicals'. The name Archer is appropriate, because his fishes have scored him many a 'bull' in shows throughout the States. A keen hobbyist, John Rudack was prominent in the early days of the American Guppy Association and in 1964 received the Journal of the Year Award from the International Federation.

Owing to structural alterations to the store, John's Guppy Room wasn't fully open, but the tanks (and there were many) that I did see were chockful of large guppies. A great believer in absolutely clear water, John has external box filters as well as sub-gravel filters in the tanks, and the job of maintaining all these was being ably carried out as we made our tour.

A speciality of the House is adult brine shrimps, and these John sells to the trade alive or frozen. Having tried unsuccessfully on more than one occasion myself to grow on these shrimps I was interested in the water

 Talks about fish with Chas and Nina McAdams of Ohio, with whom the author stayed, went on into the small hours
used in the hatchery; I found it differed little from the normal saline solution used to hatch brine shrimp eggs. One fact that might have some bearing on the problem was that Chicago mains water was heavily chlorinated; so much so that when you ran a tap you couldn't help detect its unmistakable odour!

It isn't every day that one gets the chance to win the title 'Hobbyist of the Year', but that is what my next host had received. Harry Matson and his charming wife Charlotte live about 30 miles north of the city and it was but a short run alongside the Lake on the Tri-State Tollway to their place.

I am used to garden set-ups, so the two sheds in which Harry houses his hobby were familiar to me, but generally most hobbyists in the U.S.A. use the basement of their homes and outdoor hatcheries are not the rule.

'Discus by the Bucket'

It was quickly made obvious how the title he has won was gained: on all sides tanks, each of approximately ten gallons capacity, were bursting at the seams with fish bred on the premises. Discus by the bucketful and guppies galore!

Because very little had appeared in print on spawning discus when Harry started, most of his knowledge was from the do-it-yourself trial-and-error school. For those readers wishing to try their hand at Symphysodon, here is the procedure that Harry uses. He bends strips of stainless steel, each about two inches wide by a foot long, into a U shape and places the strip in the spawning set-up with the adult pair of fish.

On these unusual spawning beds they lay their eggs and he told me he gets less incidence of eggs growing fungus than when he used more orthodox methods with pieces of slate, glass or even plants.

All, or at least nearly all, of the tanks were devoid of both plants and compost. Each contained a filter of his own design packed with charcoal and wool; these he changes regularly and by the look of the water it was clear enough to drink!

To conserve space all the tanks are above each other in tiers on wooden staging and placed with the 'square' end facing inwards. It was like walking down an avenue of activated skyscrapers.

As in the travel-film endings of old, we reluctantly said farewell to the Matsons, but not before another 'fanatic' had dropped in for a chat on fish in the person of Fred Perso.

Sunday morning arrived all too quickly and we made a visit to Chicago's Shedd Aquarium. Take London's Albert Hall, fill it with fish tanks and there you have the Shedd in a nutshell; its catalogue alone runs to over two hundred pages. Thanks to the courtesy of the curator Bill Broker, we were given V.I.P. treatment and shown all over the building.

Chicago's Shedd Aquarium

Most of the tank maintenance is automatic, and walking behind the scenes was like a trip through a factory making precision instruments; everything was so spacious and clean, and considering the great age of the place it was remarkably well kept.

The public side of the exhibition disappointed me. Fish there were and in variety but the tanks themselves were just like large, square, concrete boxes and in my view didn't show the occupants to full advantage. We were shown an experiment in interior tank decoration in the penguin pool; here the sides of the tank had been landscaped (if you forgive the pun), with imitation rockwork fashioned from fibre glass. The penguins, at least, seemed to appreciate the brighter surroundings.

One complete room was devoted to the tropical
species more familiar in our home aquariums: each two foot tank was fully furnished and the whole was set in Oriental surroundings.

If you let your eye travel south-east from Chicago on the map you will spy the State of Ohio. This is typical farming country and to the traveller its acres and acres of wheat look like the sea itself as the breeze ruffles the grain and creates wave-like patterns.

With the Alleghany Mountains on the one side and the prairie on the other, we headed for Dayton and the home of Charles McAdams, or, as his friends affectionately call him, 'Chuck'. Active hobbyist, board member, judge and dealer are just a few of his many activities in the tropical fish hobby, but it was his guppies that I wished to see on his farm 'County Line'. I had met Chas and his wife Nina at the banquet in Indianapolis and having corresponded with them from England for some time before my visit I felt I was visiting the home of old friends; their welcome showed that I was.

Utilising what had been poultry houses, Chas has some two hundred tanks although space-heated, the room didn't have that oppressiveness so characteristic of central heating and proved to me that good fish rooms could be made out of outbuildings without going to too much expense.

Along the rafters of the building were displayed the many wonderful trophies he had won, and when I inquired what the prizes were depicting a large bear, Chas told me they were from the International Show in Berlin, Germany, a show he rarely misses.

By this time my travels had dulled my brain as to what constituted a 'large' fish but here were some even larger! How does he do it? Nothing that good stock and good feeding from birth won't achieve for anyone', was his modest reply. 'Plus a suitable clean environment', he added. To add emphasis to that last remark a large external power filter gave a pleasant gurgle. Like so many husband and wife teams in the pet fish hobby, Nina runs the store from another building close by, and during my visit, people had been coming and going with purchases. Here was another surprising thing I learned about the U.S. Here it was Sunday afternoon, and the shop was going full blast as if it were the middle of the week. One store I visited advertised that they were open from 9 a.m. to 9 p.m. daily, excepting Sunday (this was their early closing day—when they closed at 7 p.m.). Small wonder that tropical fish-keeping is America's second largest hobby.

So as to be able to attend my lecture in Big I, Chas had invited Paul Halme to stay at his home. Here is a man dedicated to the hobby and one with whom any aquarist could cheerfully talk on fish matters well into the wee hours—as we very nearly proved.

On the subject of fish going off their food, Chas has this tip to offer: try mixing a few deeps of amine oil in with almost any dried fish food; this soon restores their appetite, a fact I have since verified here in Britain.

In the huge tank of looking after all these fishes they are helped by their son Paul and a large family backing; it seems that everything about the McAdams is big, from their generosity to the width of their welcoming smiles. At night everyone gathered in the farmhouse and over gallons of coffee we discussed the hobby on both sides of the Atlantic.

Looking back, perhaps you may think that I visited only outstanding hobbyists and not the run-of-the-mill fish-keeper. That they were outstanding I cannot deny, but they were typical of the general fish-keeper at least as far as aquarium set-up and methods were concerned.

Next month: We meet 'Mr. Killifish', judge 'Best in Show' at a shopping centre and the 'Seven Seas' gets a new assistant!

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**British Marines in the Window**

A GLANCE in the window of Stirling Aquarium Installations of Hammersmith, London, might encourage you to try keeping our native marine creatures. Customers of Mr Frank Sanders returning from Bournemouth have brought him specimens which have survived, so far, for a year. These include what is thought to be a mullet, a shore-dab, about six blemies and an edible crab.

Equipment is very ordinary— an unadapted 44 in. by 11 in. by 11 in. aquarium. The new tank originally used for freshwater fishes, an internal filter costing 5s., some sharp sand and a few pieces of rock.

Sea water was obtained, and this has attacked the top rail of the tank. Pieces of rust falling into the water have done no harm to the occupants, however. No topping up has been done during the summer and winter. During the warmer part of the year loss by evaporation was made up with tap water. Brought up specimens which have survived, so far, for a year. These include what is thought to be a mullet, a shore-dab, about six blemies and an edible crab.

Temperatures have varied between 45°F and a little over 70°F (8-22°C). Daylight is intense enough to cause the tank's glass sides to become obscured with a thick curtain of dark green algae, which is occasionally detached with a razor-blade.

Frank doubts the wisdom of including crabs, which are aggressive predators and, in such a confined space, attempts to keep two or more together always resulted in one surviving. Sand-sels also became their victims. The only other failure was an attempt to include large, six-inch anemones thought to be from deep water off the Cornish coast. These refused to feed.

Smaller anemones—which are fed with fragments of food offered on the point of a knitting-needle—have bred in the tank.

Twice weekly feeding is with tubifex worms supplemented in warm weather with small pieces of raw fish (bought for the cat!).

Mr Sanders' advice is to avoid large specimens: 'Get small stuff and let it grow'.

FRANK STONE
A course for the would-be breeder of tropica

This is the first of a series of articles I have been invited to write on tropical fish. It would be impossible to cover all the species that are now kept in aquaria, but I hope to split them into groups so that each article will cover a number of species that will thrive under similar conditions, and breed in those circumstances.

The first few articles will cover the non-exacting and therefore easier to keep and breed species, going on to the slightly less easy ones, then the generally regarded more difficult fishes, and finally perhaps some of those which will require special care and attention.

Presuming the aquarist has tanks, heaters, thermostats, and, where necessary, light-hoods, sand, rocks, and a variety of healthy plants, the next and most important factor is water. Too many aquarists regard water as something required for their fishes to swim about in. This is far from accurate.

In Nature all the water on earth is provided by rain; occasionally this falls as hail or snow. During its fall from the skies rain will pick up impurities in the atmosphere, so in very industrial districts it would pay the aquarist to get water from less smoky areas. In the forest regions, where most of the tropical fishes come from, the rainwater is probably as pure as it can ever be. It has always been my endeavour to keep as close as possible to Nature, and this is surely a good reason to fill aquaria with clean rainwater.

On reaching the ground rain percolates through the soil, and again picks up various minerals on its course to underground springs, ditches and hollows which form rivers and ponds. In chalky areas water will pick up calcium, and is likely to be hard and alkaline; in peaty areas, bogs and tropical swamps where leaves and other vegetable matter fall and rot down, the water is likely to be soft and acid. Thus in Nature something like 75% of all the species come from regions where the water is soft and acid, 20% from neutral areas, where the water is neither very hard nor very soft, and only about 5% from places where the water is hard and alkaline.

Most tap water in this country is hard and alkaline, so it is not likely to suit the majority of fishes an aquarist keeps in a community tank. Whilst on the subject of tap water, a grave warning must be given about copper piping and copper cylinders. In many new buildings this metal is now generally used, and few aquarists realise how deadly it is to fish. Recently I have heard from many fish-keepers that their fishes have suddenly started dying; their tanks look healthy and no disease is apparent, but deaths follow one another rapidly. If a tank is newly set up with water that has stood for some time in a copper cylinder or pipes, deaths can commence a few hours later.

When the taps have been run for a long time before the tank is filled the amount of copper present is greatly reduced but, if when making up for evaporation losses the tank is always topped up with water containing copper salts, the build-up eventually reaches a toxic concentration, and deaths begin to occur. So many people have told me that everything in their aquaria has been fine for months, and asked why now should these fatalities suddenly manifest themselves? I advise an immediate change of water from a copper-free source, and though the fish which have reached their limit of copper poisoning will die, those still below this level will make a quick recovery.

Any aquarist not certain about his tap water supply should make an inspection immediately, and if pipes and cylinder are of copper he would be wise to change most of the water in his tank for rainwater. In spite of the fact that rainwater is suitable for most fishes, it must not be stored in a copper or galvanised tank. Zinc, as well as copper, is a poisonous metal. Rainwater from an old iron bath, wooden butt, china sink, or enamel bucket is safer.

If an aquarist intends to become a good breeder of many species of tropical fish he will have to have at least three types of water: (1) alkaline and hardish for the few species that require this; (2) a good deal of clean rainwater that is slightly acid and on the soft side. This will suit the breeding habits of a great number of species. Finally (3), some very soft, pretty acid peaty water, for...
the supposedly difficult and more exacting species. As it is unlikely that the average aquarist can go out and collect nearby these three types of water, he will have to start with rainwater and either harden or soften it himself. As stated previously, the majority of tap water is on the hard side, so a small quantity of this water can be obtained easily enough in most districts. Rainwater may not be easy for some aquarists to obtain; those living in flats or industrial areas may have to travel a few miles into the country to collect this from a friend’s house. If unable to do this, then it would be advisable for the aquarist to breed only those species requiring the conditions he can provide. But to those who can and are willing to make a determined effort to secure the right type of water the breeding field is much wider.

Soft peaty water is obtainable only in a few districts. It can be made from rainwater, but this is going to take weeks, or even months, to be made ready for use. For the breeding of neonias, cardinals and Notobranchus, therefore, such aquarists are advised to make the preparations now, and by the time these articles reach the stage they should have the water available. Since fish have been on earth much longer than man, they have adapted themselves to the conditions prevailing in their natural habitat.

For instance, eggs or spores that have never had to contend with the salts found in hard water are not equipped to withstand these, so it is expecting too much to imagine that when expelled into hard water they can survive. Even though fishes can slowly adapt themselves to slightly different conditions, the eggs or spores certainly will not. If you are going to become a good breeder of these types of fishes sooner or later you will have to have soft peaty water, so why not prepare now? Even though you may not initially have great success you will gain experience, and each attempt will get you a little nearer the ultimate goal.

We will now deal with the making of this soft peaty water. Procure an old iron or enamel bath, enamel sinks or even use a polythene pool or buckets; anything, in fact, that will hold rainwater for a long time, and which is not contaminated by copper, zinc or other poisonous metal. Fill all the containers you can muster with pure clean rainwater. Buy from your local nurseryman or corn-chandler some peat (usually sold in bags or bales). You will require enough broken-up peat to fill the ordinary 2-gallon bucket for each 50 gallons of rainwater. Throw the broken-up peat on to the rainwater and cover with sheets of glass. Over this place some roofing felt or black polythene to exclude light, thus preventing the growth of
algal. Each week stir and break up any lumps of floating 
peat. Eventually this will all sink and the water, although 
clear, will be a deep red-brown. Before it is usable all the 
peat must have become completely waterlogged, and 
remain so for at least one month after this.

When using any of this water do not dip in a jug or 
bucket. This will stir up the peat and cloud the water. 
Use a siphon tube and draw the water gently off. This 
is then warmed up to 80°F (26–27°C) and poured into the 
clean bare breeding tank. As soon as the required peat 
water has been drawn off, top up this store with the 
same quantity of rainwater. The original rainwater 
becomes saturated with humic acid, but when some is 
drawn off and the remainder is topped up with rainwater 
saturation point is lowered, and more humic acid will be 
drawn out of the peat. If not used too frequently, the 
topping-up process may be continued for a year before 
the peat is all used up. Of course, the larger the container 
you have the more peat it will hold, and the longer it will 
last before renewal becomes necessary.

This natural process must not be hurried. Never place 
the peat in a bag or pillow-slip and boil it. This boils out 
the humic acid to such a strength that it will kill most 
fishes within a few hours.

Lake Water Cress
By C.D. ROE
Armoracia aquatica (Eaton) Weigand
A plant for pond or tank

This is a native of the North 
American Continent from 
Quebec to Minnesota southwards to 
Florida and Texas. Commonly called 
lake water cress, it is quite a useful 
plant for both warm and coldwater 
aquaria. The lake watercress is 
completely hardy in Great Britain. 
In the young plants the leaves are 
simple but as the plant grows and 
develops they become more divided. 
Eventually, the plant which at first 
is a squat bushy growth, develops 
an ascending stem, often with leaves 
so finely divided that it resembles a 
giant myriophyllum. If this stem 
should ascend above the water 
surface the leaves again become 
simple and rounded and a head of 
small white flowers is produced.

There has been a certain amount 
of confusion in books between this 
plant and the common water cress, 
largely because of synonyms under 
which Armoracia aquatica has been 
known; the names Nasturtium 
nasturtium and Rorippa aquatica have 
been given to this plant, whereas 
Rorippa nasturtium and Rorippa 
aquatica are proper names of the 
common water cress.

Lake water cress is an exceedingly 
easy plant to propagate. All that 
needs to be done is to cut the stem 
into pieces and plant these either 
under bog conditions or fully sub-
merged, when small plants will 
develop in the spines of each leaf. 
Similarly, leaves or pieces of leaves 
will root and eventually produce 
tiny plants. The quickest method 
of all is to pinch the top off the 
ascenting stem, when plants will 
develop quite soon in the spines of 
some of the leaves. Plants should 
be separated from the parent plant 
when 1½ to 2 inches in size.
Lake Water Cress

Armoracia aquatica (Eaton) Weigand

A plant for pond or tank

Lake water cress becomes saturated with humic acid, but when some is drawn off and the remainder is topped up with rainwater saturation point is lowered, and more humic acid will be drawn out of the peat. If not used too frequently, the topping-up process may be continued for a year before the peat is all used up. Of course, the larger the container you have the more peat it will hold, and the longer it will last before renewal becomes necessary.

This natural process must not be hurried. Never place the peat in a bag or pillow-slip and boil it. This boils out the humic acid to such a strength that it will kill most fishes within a few hours.
AT a recent meeting of the EAST LONDON AQUARIST AND PONDKEEPERS ASSOCIATION (meetings first and third Fridays in each month at The Ripple School, Ripple Road, Barkingside, Essex) an interesting talk by Mr J. V. Morrice, F.B.A.S. Lecturer and Judge, described the various criteria that formed the basis of judging fish and aquaria. A number of pertinent questions were put and a very lively debate developed among the many enthusiasts who attended the meeting, in spite of bad weather. It was agreed that the meeting had been both instructive and entertaining and should result in further successes for the club when competing in shows.

MEMBERS of WALTHAMSTOW & D. A.S. have an interesting summer ahead of them if they take part in all the activities organised by the Officers of their Club. A visit to Queenborough Fisheries in April is to be followed on 7th May by one to Shirley Aquatics Ltd and there will be a river trip for members and their families on 22nd May.

CANTERBURY & D. A.S. are fortunate in having ample accommodation for meetings, one of the two rooms at their disposal having running water and plenty of bench space. At a recent meeting, six new members joined over 30 others to hear a lecture on the various aspects of entering fish in shows.

THREE members of the NOTTINGHAM & D. A.S. gave their fellow club members a very entertaining evening recently. Mr E. Smith contributed an hilarious ten minutes with an off-the-cuff talk on his experiences in obtaining, breeding and selling various fish. Mr G. Bulleyment spoke of the unexpected spawning of a pair of A. ramirezi, and Mr N. Goodliffe explained the uses of a microscope in the identification of various fish ailments and produced excellent drawings to demonstrate the appearance of these diseases under the microscope. At the table show that followed, results were:

- Class A (cichlids): 1, Mr K. Riley (A. bicolor, 76 pts); 2, Mrs I. Bulleyment (A. reisneri, 76 pts); 3, Mr G. Bulleyment (A. microlepis, 71 pts).
- Class B (large cichlids): 1, Mr K. R. Riley (A. microlepis, 76 pts); 2, Mr K. R. Riley (fenestrata, 72 pts); 3, Mr R. Green (angel, 65 pts).
- Class C (mollies): 1, Mr D. Towell (black molly, 81 pts).
- Class D (guppies): 1, Mr Bronton (81 pts); Class E (novices): 1, Mr Carter (Macropodus, 84 pts); 2, Mr Truselow (P. fasciatus, 84 pts); 3, Mr Binnie (A. genualis, 81 pts); 4, Mrs Butland (A. genualis, 83 pts).

Class B (danios, rainbow and white cloud mountain minnows): 1, Mrs Peters (C. auratus, 80 pts); 2, Mr Bull (zebra, 79 pts). Class C (mollys): 1, Mr D. Towell (black molly, 81 pts).

Mr B. Inness.

At the annual general meeting of UXBRIDGE & D. A.S. the chairman Mr H. Moore reported a very successful year. Membership had increased to over 30 and club activities which had included lectures on EXCITING news is released this month of an International Tropical Fish Exhibition in Manchester on 11-22nd June (see 'Dates for Your Diary' for full details). This is a joint venture of the FANCY GUPPY ASSOCIATION and the BRITISH KILLIFISH ASSOCIATION, and entries and visitors from the numerous overseas members of these associations are expected. The Exhibition is to be supported by trade stands and other exhibits, and facilities at the venue include refreshment rooms, bar, a large hall and a cinema at which films will be shown through the weekend.

A GROUP of local enthusiasts, under the auspices of the ALFRETON Arts Association, have recently formed an Aquarist Society, meetings of which are held at the Arts Centre. The objects of the Society are to promote interest in the study of aquatic life in general by exchange of ideas between members and arranging of lectures by leading experts and also to organise shows for the benefit of local charities. Interested fish-keepers should contact Mr M. J. Stearns, 52 Park Avenue, South Wingfield, Derby.

ANOTHER newly formed society on the South Coast at EASTBOURNE, has prepared a full programme for its fortnightly meetings, with talks on fish-keeping, breeding and aquarium management, interspersed with fish table shows. Meetings are held at Crown Inn, Old Town, Eastbourne and prospective new members are asked to contact the secretary, Mr Colin George, 6 Hurst Road, Eastbourne.

THE monthly Bulletin of the AIREBOROUGH & D. A.S., editor Mr R. E. Hampson, reflects the enthusiasm of its club membership. A new cover, extra pages and the success of its 'Corresponding Membership' scheme, whereby fishkeepers who cannot attend meetings can, on payment of only a portion of the full subscription rate, receive issues of the monthly Bulletin, Year Book and even enter for suitable competitions, all indicate growing interest in the Society's affairs.

RUGBY & D. A.S. have a full programme of club and inter-society eliminator shows this year. They plan 14 table shows, including six new 'Fish of the Month' shows. At a recent meeting the personal experi-
ences in breeding, feeding and rear-
ing young fry related by club mem-
ers Mr Edden (guppies bred to
standards laid down by the F.G.B.S.),
Miss Shaw (Corydoras schultzi), Mr
Spencer (cichlids) and Mr Fox
(angels) provided a wealth of infor-
mation for fellow members.

AT a meeting in February Mr K.
Barracough of Bradford gave a very
interesting talk to KEIGHLEY &
D.A.S. members on the commercial
side of tropical fish breeding. Show
winners at this meeting were: Class
A: 1, Mr A. White; 2, Mr A.
Campbell; 3, Mr D. Connelly; 4, Mr
A. Campbell. A.O.V.: 1, Mr A.
Smith; 2, Mr A. Campbell; 3, Mr R.
Edinson; 4, Mr A. White. Junior
A.O.V.: 1 and 2, A. Smith; 3 and 4.
R. Price.

OVER 70 people attended the
meeting of the NORTH WEST
LONDON GROUP OF AQUAR-
ISTS SOCIETIES held at the Hamp-
stead Aquatic Society’s address,
35, Steelees Road, Hampstead.
The Group consists of five clubs
who hold one meeting at every member club’s
meeting place each year. While
the judging took place members
and friends were given an inter-
esting slide show by Mr H. Harridge,
a keen Hampstead A.S. member.
Refreshments were kindly provided
by Mrs Pye, wife of Hampstead’s
secretary. All classes were very well
supported. Judge was Mr A. Jess-
opp, chairman of the F.B.A.S.,
who presented the prizes. Prize winners
A.V. angels: 1, Mr F. Caffell;
Independent A.S. (ordinary angel,
79 pts); 2, Mr F. Caffell (ordinary
angel, 78 pts); 3, Mr T. Glass,
Willesden A.S. (black angel, 77 pts);
4, Mr T. Glass (black angel, 76 pts).
A.V. fighters: 1, Mr J. E. Chapman,
Independent A.S. (red male, 81 pts);
2, Mr J. E. Chapman (red male,
80 pts); 3, Mr C. Buckland, Riverside
A.S. (blue male, 78 pts); 4, Mr G.
Aylard, Riverside A.S. (female, 77
pts). A.O.V. livebearers: 1, Mr S.
Harmen, Riverside A.S. (blue lima,
82 pts); 2, Mr F. Tomkins, In-
dependent A.S. (Limia eitaitia, 79
pts); 3, Mr F. Caffell, Independent
A.S. (L. eitaitia, 78 pts); 4, Mr T.
Glass, Willesden A.S. (L. eitaitia,
77 pts). A.V. Danios, rasboras, white
cloud mountain minnows: 1, Mr
Biggs, Riverside A.S. (Rasbora jacob-
si), 81 pts); 2, Mr H. White, Hendon
A.S. (Rasbora elegans, 79 pts); 3,
Mr R. Biggs, Riverside A.S. (Ras-
hora borgesenii, 78 pts); 4, Mr D.
Benzie, Independent A.S. (zebra
danio, 77 pts). Riverside A.S. won
the annual trophy of the
N.W.L.G.A.S. with total points of
130. Best fish in show was also won
by a Riverside member, Mr Biggs
with his Rasbora jacobsoni.

MAIN event at ILFORD & D. A. &
P.S. monthly meeting in February
was a cross-quiz between mem-
bers and their friends. Questions
were prepared by Mr Brill and Mr
and Mrs Ruth. Anyone interested
in fish-keeping and water life can be
sure of a friendly welcome at the
monthly meetings held at St.
Lawrence’s Church Hall, Donington
Avenue, Barkingside. Further de-
tails are available from secretary Mr
R. Rust, 13 Dunkeld Road, Good-
mayes, Essex.

THE BARRY A.S. has now held
the second of its series of film
slides shows. The slides came from Brent-
wood, Essex and were on aquarium
plants. Mr D. Johns read the com-
mentary while Mr I. Taylor worked
the projector. While the slides were
shown, Mr D. Wigg of Luton
Major judged the table show with
the assistance of Mr P. Battles of
Cardiff. Results: livebearers: 1, F.
Denton (79 pts); 2, Mr Tippings (75
pts); 3, G. Robert (73 pts). Egg-
layer: 1, F. Harris (78 pts); 2, Master
Phipps (74 pts); 3, Mr Luntion (69
pts); 4, Master Phipps (64 pts). This
was the first table show of the year
with three to follow. The points will
be totalled at the end of the year to
see who will hold ‘The Points
Shield’ for one year. Last year’s
winner was Mr F. Denton.

MEMBERS of CORBY & D. A.S.
had a talk on an unexpected subject
at their monthly gathering at the
Nag’s Head last month. Mr Frank
Vicker, who was to have given an
address on plants and the setting up
of tanks, was prevented from attend-
ing and the gap was filled at the last
minute by Mr Geoffrey Mose, B.Sc.,
who dealt with some of the lesser
forms of marine life. A bring-and-
buy sale for the club funds raised
just over £4 and a table show of any
variety tropical and coldwater fish
was held; results: 1, T. Kelly (fan-
tail goldfish); 2, B. Deans (dwarf
gourami) and D. Haig (browns tetra);
3, M. Brown (emperor tetra). A
junior plant recognition test was won
by D. Cole and this success also
brought him the junior shield.

A FULL programme of meetings is
planned for the coming months for the SOUTHEND, LEIGH & D.
A.S. Held on the first and third Tuesdays in the month at the
Liberal Hall, Clarence Road, Southend, these will include talks on
breeding barbs, on catfish, fry raising etc., with slides shown of cichlids
and marine tropical fish, advice from visiting speakers and table and inter-
club shows. Recently an illustrated lecture on characins was given by the
president, Mr A. J. Mason, and the secretary, Mr M. Willis. At another
meeting Mr S. C. Wyster made a talk on coldwater fishes. Besides being an
aquarist, Mr Haley is also a keen angler and so was able to cover fishes
that are native to this country as well as the varieties of goldfish. At a table
show for cichlids held on the same evening, the following: results were: 1, Mr A. J.
Mason (A. ramirezi); 2, Mr M. J. Willis (blue acara); 3, Mr J. J. Mason
(A. appendiceus). Details of membership etc. can be obtained from secretary
Mr M. J. Willis, c/o Arundel Gardens, Westcliff-on-Sea.

A NEW society is to be formed at headquarters at the Raven Hotel,
Colbridge, Stoke-on-Trent. The aim of the group will be to study breed-
ing fish, biology, water plant life, administration of an aquarium and
exhibiting work. Interested aquarists should get in touch with the Sec-
retary, c/o The Raven Hotel.

AN outing to the south coast for the collection of specimens is planned for
members of the MARINE STUDY AQUATIC SOCIETY on 1st May.
Non-members can join in (own transport required) and further particulars are available from Mr
A. S. Meteger, 112 Brooke Drive, London, S.E.1. Two members of the
Society’s Committee plan to travel to Holland at Easter to estab-
lish contact with Dutch aquarists interested in marine aquaria and to
see fish houses and breeders’ establish-
ments etc. in that country. Two new
members of the Committee are Miss F. Blackwood (assistant secretary/ treasurer) and Mr A. S. Meteger
(public relations officer). Interesting information about the coelacanth
(the Society’s symbolic fish) with other
notes and articles, was given in the March
issue (number 3) of the
Official Journal of the Marine Study
Aquatic Society, which is free to members and available to non-
members by subscription (details
from the secretary, Mr G. H. Jen-
nings, a Gatecombe Road, Tunfull

Mr J. V. Merrie is chairman of the
Society and not vice-chairman as indicated in our caption to his
photograph in our April issue.

WHEN the MEDIWAY A.S. were
hosted to the Erith, Sittingbourne and
Canterbury clubs recently at their new meeting place (Dunescourt
School, Watling Street, Gillingham), a table show was held, the classes
being for Labyrinth, Cichlids, Livebearers and Sharks and Louches.
The classes were very well supported,
most having twenty or more entries.
All the fishes entered were of a high
standard, Special awards are pre-
presented by Medway for any fish
obtaining over 85 pts. and three of
these awards were presented. The
best fish in the whole show was a
black shark, owned by a Medway
member. Erith was the highest
prized society of the evening
followed closely by Medway and then
Sittingbourne. The F.B.A.S. judge
was Mr G. H. Jennings. While the
judging was taking place in an annexe
to the main hall, the club members
and their friends were shown several
very interesting films, one of which

Championship Classes Under Discussion

Mr J. Stillwell (Portsmouth A.S.)
put a point to F.B.A.S. chairman Mr
A. G. Jessop (right) and secretary Mr
K. J. A. Fyfe (centre) during the
F.B.A.S. Assembly

for delegates to take back to their
societies and to be voted upon at the
next F.B.A.S. Assembly in June.
A motion read at the last meeting,
that “no “B Class” Judges shall be
upgraded to “A” status in both
Goldfish Varieties and Coldwater,
and in ‘Tropical, Classes’, was voted
upon after discussion and defeated.
Election of a treasurer was post-
poned because of lack of candidates.
The vacant place for one Council
member was filled by Mr G.
Jennings, voted in by a single vote
majority. A table show of egg-laying
toothcarps staged during the Assemb-
ly was judged by Mr F. Tomkins
(Independent A.S.).
Three Counties Group

THE meeting held at Didcot on the 16th March took the form of a social evening and an inter-club table show between Reading, Basingstoke, Bracknell and Didcot, the clubs forming the THREE COUNTIES GROUP.

Each club entered six fish of any variety in square jars. The fish were of excellent quality and the species were also well varied.

Individual prize-winners were:
1. Mr P. Merrit Reading (H. rubripictum, 89 pts); 2. Mr L. Ludgrove, Basingstoke (P. hribensis, 88 pts); Mr R. Keeping, Basingstoke (A. ramiﬁci, 86 pts); Mr P. Merrit Reading (catﬁsh, 86 pts).

The host club provided refreshments on a lavish scale and the judge for the evening was Mr J. V. Mortice of Hendon & D.A.S., whose time for judging the entries was very restricted owing to the earliness of the last train back to London. Overall results were: 1. Reading (99 pts); 2. Didcot (72 pts); 3. Basingstoke (71 pts); 4. Bracknell (57 pts).

was on marine life. After the prizes were presented to the winners the judge commented on the high quality of most of the exhibits on the bench.

AT a meeting in February of HENDON A.S., a slide show/lecture was given by one of the members of the new Marine Study Group, on how to set up and maintain a cold-water marine aquarium. Much enthusiasm was shown for this subject by the audience, and an interesting discussion followed on differences of opinion about the keeping of marine aquaria.

CHANGE of time and meeting place for NEWPORT A.S.; from the April meeting, the Society will meet on the first Tuesday of each month at the R.A.O.B. Club, Stow Hill, Newport, at 7.30 p.m. Officials of the Society during 1966 are: president, Ralph Harris; chairman, Jack Burgwin; vice-chairman and magazine editor, Terry Wall; secretary, Mrs Anne Salmon (Helvellyn, 23 Glanmor Park Avenue, Newport, Mon., telephone 735883); treasurer, Ivor Phillips; show secretary, Michael Parry (45, Western Drive, Gabalfa, Cardiff, telephone 66573); junior representative, Master Paul Williams, and Messrs Leo Bannister and P. Glyn James.

AT the THORNE A.S. meeting in March a lecture was given by Mr E. Atkins of Derby on barb's habits and breeding and he also judged a table show for best pairs: 1. H. Candow, dwarf gourami; 2. A. Powell, A. ramiﬁci; 3. J. Brown, tiger barb. Mr J. Brown presided.

AT the annual meeting of the DERWENT A.S. Mr S. Yeomans, chairman, was re-elected. Mr H. P. Finch, secretary for several years, did not seek re-election for health reasons, and was succeeded by Mr A. Addiey, who also retained the office of show secretary. Mr Finch, who was secretary of the club in the late 1940s and 1950s was thanked for his services by the chairman, seconded by the treasurer (Mr T. G. Swinburne). He is a life member of the club. Mr Swinburne and Mr W. Gwyman were re-elected treasurer and librarian respectively.

THE EAST DULWICH A.S. held their Annual Social and Award Night on 26th March at their headquarters, 110A Lordship Lane, S.E.22. Mr A. Jessopp, F.B.A.S. judge, was present accompanied by Mrs Jessopp and their daughter. During the interval the following awards were presented by Mr Jessopp: plaques: Mr P. Andrews (600 yrs); Mr H. Aves (labyrinths); Mr P. Bowler (barbs); Mrs N. Castle (characins); Mr L. Cole (catﬁshes); Mr C. Feldman (livebearers); Mr A. Gale (toothcarps); Mr A. Rose (B.O.V); Mr R. Salmon (ﬁghters); Mr S. Sears (cichlids); Mr S. Sears (brooders); Plant Cup: Mr A. Gale; Junior Cup: E. Bolingbroke; best ﬁsh of the year cup: Mr A. Rose. For the ﬁrst time the junior members competed for the junior cup, kindly presented to the Club by Mrs N. Castle, who was until recently chairman for the current year. This will be an annual competition and the Society would like to see many more young people taking part in this kind of 'battle'. After the awards had been presented, the wives of the offi cers and Mrs Jessopp were presented with bouquets by the small daughter of Mrs and Mrs R. Salmon. Thanks were given to the family friends of the acting chairman for their hard work in preparing and setting out the refreshments, which were much enjoyed by all present. This annual 'get together' is a little appreciation from the Club members to the wives, who have much of the suf ﬁ cence connected with fish-keeping but very little of the glory.

NORTH LONDON A.S. has now been re-formed. Past members and newcomers to the hobby are invited to join. Further details can be obtained from Mr R. F. Chitty, 24 Hermitage Road, London, N.4 (phone STA 2378).

AT the INTER-SOCIETY SHOW held at Leamington on 27th March, the ﬁ nal results and league placings for the year were announced by Mrs Pearson (Rugby, Apistogramma ramirezi); 2. Mr D. Brace (Leamington, Astronotus ocellatus); 3. Mr and Mrs Pearson (Rugby, Apistogramma reizigii). Anabantids: 1. Mr A. Whitney (Rugby, Betta splendens); 2, Mr D. Lucas (Leamington, Osphromenus goramy); 3. Mr G. H. Smith (Tamworth, Trichogaster leeri). Breeder's: 1. Mrs Delves (Atherstone, Xiphophorus sp.: red-eyed red); 2. Miss R. F. Shaw (Rugby, Limia nigrofasciata); 3. Mrs Delves (Atherstone, Xiphophorus sp.: yellow wag platy). Fish of the show (92 pts) was the Apistogramma ramirezi. An added attraction at the Show was the decorated jar class and 34 entries were received. Of these, the ﬁrst three

South Wales Federation

RAPID expansion of societies and growth of interest in aquarium-keeping is taking place in South Wales. Firmly established societies are those at Barry, Bridgend, Cardiff, Llantrwit Major, Pontypool and Newport, and those have formed the FEDERATION OF SOUTH WALES AQUARISTS' SOCIETIES. Officers elected for 1966 are: chairman, Mr R. Wigg; vice-chairman, Mr J. Cavanagh; secretary (temporarly), Mr M. J. Parry (45 Western Drive, Gabalfa, Cardiff); asst. secretary, Mr C. Roberts; treasurer, Mr J. Barnes. The next meeting to be held is on Saturday 7th May, 7.30 p.m., at the Old Arcade Inn, Church Street, Cardiff.
awards went to: 1, Mr B. Woolerton (Rugby); 2, Mrs P. R. Upton (Northampton); 3, Mr E. Upton (Northampton). The total points and position of the clubs involved are now: 1, Rugby (55 pts); 2, Atherstone (43 pts); 3, Coventry (38 pts); 4, Leamington (37 pts); 5, Tamworth (29 pts); 6, Northampton (27 pts). The fourth and final round of this season will be held at Coventry, Wyken Community Centre on 13th May.

NEWS of RUGBY A.S. is spread wide. Extracts from the Rugby Newsletter are already printed in New Zealand, and other countries including Rhodesia, Czechoslovakia, the United States and Canada regularly receive current publications. Now, shortly, a taped quiz is to be exchanged between Rugby and the New Plymouth Pool and Aquarium Society in New Zealand. At the March meeting of the Society, member Mr B. Fox gave a talk on 'Decorated Home Aquarium', illustrated by slides. Mr Fox dealt, step by step, with the setting up of a beginner's aquarium which would be suitable for entering a decorated aquaria competition. The choice of plants, suitable ornamental rockwork and the selection of fish were discussed.

AT the BOSTON A.S. monthly meeting in March, the chairman, Mr Woodthorpe, gave a demonstration of glazing small tanks. The club is now beginning to flourish and a show for livebearers, judged by Mr Yeaden of Skegness Marine, attracted a large entry. Meetings are held at the St. John Ambulance Hall, Boston, Lincs., and a welcome is extended to anyone interested in tropical fish.

Show dates—see page 62

PETFISH photo competition

Rules and Conditions
The following rules should be adhered to:
1. The competition is open only to amateur photographers.
2. Each entry or set of entries (no limit to number) must be accompanied by a completed entry coupon from a current issue, and sent to PETFISH MONTHLY (Photographic Competition), 334 Garratt Lane, London, S.W.17. Final closing date for entries will be announced later.
3. All reasonable care will be taken of prints and transparencies but responsibility cannot be accepted for entries lost, delayed, mixed or damaged in the post or otherwise. Proof of posting cannot be accepted as proof of delivery.
4. Each print or transparency should bear the name and address of the sender in capital letters.
5. Black and white prints should be glossy preferably, of not less than postcard size. Negatives should not be submitted.
6. Prints and transparencies will be returned only if a stamped and addressed envelope for this purpose is provided.
7. Entry into the competition will be deemed to constitute submission of the photograph for reproduction in PETFISH MONTHLY and reproduction fees will be paid for any material not in the prize-winning categories that is published.
8. All prize-winning photographs will be published in PETFISH MONTHLY without further fee.
9. The judges will be the Editors of PETFISH MONTHLY and one other (name to be announced). Their decision is final and no correspondence can be entered into concerning the competition.

Categories
PetFish Monthly invites you to send in your entries under the following categories:
I Black and white photographs
(a) Fish/aquarium scene
(b) Garden pond
II Colour prints and transparencies
(a) Fish/aquarium scene
(b) Garden pond

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I have read and will conform with the Rules and conditions of the PetFish Photo Competition. I declare that the entry (or entries) submitted are my own work as an amateur and not that of a professional photographer.
Signed ...........................................................
Date ..............................................................
Valid until 31 May 1966
Round and About the Trade

Inter-Pet’s Fish Section at Newdigate

ALTHOUGH it is only just over a year since Inter-Pet’s Fish Supplies section moved to larger premises at Newdigate, Surrey, already it is working to full capacity and further expansion on a new site is being contemplated. Mr A. C. Lambert, who controls the wholesale fish supplies division for the Company, showed PetFish MONTHLY’s reporter around the buildings, which before extensive conversion previously had served another owner as slaughterhouses.

Some 200 tanks, each up to 50 gallons in capacity, are used to hold the 60 or so species normally available. Most of these are fishes imported from Africa and the East, which are for wholesale distributors to the trade all over Britain. No retail business is done by the firm. Nearby Gatwick Airport is used to send some of these fishes to distant trade purchasers.

The buildings have been heat-insulated with expanded polystyrene, and it has been found necessary to run the Bering fuel oil-fired heating system only at night to maintain an adequate even temperature. The heater is fan-driven, blowing heated air for space heating. Air supply to the tanks, all of which are equipped with filters, is not from a compressor, the usual air source in commercial fish establishments, but from a special type of blower that gives a very high output at a satisfactorily low pressure.

Mr Lambert described the care taken by his staff to avoid outbreaks of disease from newly arrived fishes whilst in quarantine. All jars and nets after use are sterilised by immersion in a large container of dilute formalin and tanks are thoroughly cleaned between batches of fishes.

New stocks were due to arrive the day of our visit and many tanks were clean and empty of fishes, awaiting the arrivals. Among fish in stock, however, were six very fine black lyretail mollies imported from Hong Kong, the females being particularly large. Some tanks of eye-catching, slender silvery fish having rainbow markings on their sides that flashed and faded as the light caught them seemed to be new to the import list. ‘They appear to be a species of Barilius from Thailand’, said Mr Lambert, ‘but so far we have not identified them.’ (Subsequently PetFish MONTHLY was able to check the identity of some specimens taken for this purpose as Barilius ornatus.)

Mr Lambert, who is a well-known figure in the aquarium trade and has been with the parent company, Liquify Company Ltd., for six years, has a keen personal interest in aquarium fishes, and says he is very happy now to be doing a job which for many years was only his hobby. At one time he was a fish judge for the F.B.A.S. and was a familiar personality at the shows, but looking after a large-scale importing and distributing business leaves him little time for that sphere of fishkeeping now.

A CONCISELY printed table showing in summarised form the feeding habits, required temperatures, hardness, adult size and minimum tank size for 100 popular tropical fishes forms two pages of a new eight page colour folder that describes the full range of TetraMin products. This is obtainable by sending a stamped and addressed envelope to Herb Royal Limited (Colley Lane Estate, Bridgewater, Somerset).

SHIRLEY AQUATICS Limited have published an informative and well-illustrated 12 page booklet entitled The Marine Aquarium Made Easy (price as post free). This firm informs us that they are now handling the new sea salt mixture TropiMarin-Neu developed by Tropi- carium Frankfurt, Germany.

KEITH BARRACLOUGH of Bradford is issuing two attractively printed and illustrated catalogues of equipment, one for retail and the other for wholesale customers. The retail catalogue contains a useful diagram on aquarium lay-out and a page of information about keeping marine fishes. For a yearly subscription of £5, a monthly News Sheet is available from this supplier, and the latest issues we have received present some interesting notes on available new fishes and equipment.

BARRY M. AUSTIN, trade supplier, has produced a revised wholesale price list for retailers, giving details of several lines exclusively distributed from 95 Crown Road, Twickenham, Middlesex.

We were shown the hot-bum-bubbling process by which Metaframe stainless steel tanks are glazed when we visited Inter-Pet Supplies Co. Ltd. last month. Increasing demand for these has led to a streamlining of the process. Three types of Metaframe reflectors and hoods are produced and a new stand of contemporary design is about to be marketed for these tanks.
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BOOKS
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INTERNATIONAL TROPICAL FISH EXHIBITION
Saturday 11th June: 12 noon-8 p.m.; Sunday 12th June: 10 a.m.-7 p.m. at the Drill Hall, Manchester Regiment, Ardwick Green, Manchester. Organised by the FANCY GUPPY ASSOCIATION and the BRITISH KILLIFISH ASSOCIATION, including Open Sections for Guppies, Killifish and Furnished Aquaria for all Aquarists Societies. Wrote for further details to Show Organiser, Mr. R. Beresford, 99 Valley Road, Arden Park, Bredbury, Cheshire.

CALLING ALL AQUARISTS!
Do not miss the AQUARISTS’ CONVENTION and Open Show in Birmingham Sunday 8th May 1966 at Moseley Secondary School, College Road, Moseley, Birmingham.

The SHOW. Benchings of exhibits 12 noon-3 p.m. PRIZES CASH PRIZES. The CONVENTION. Commencing at 3:30 p.m.: Jim Kelly, F.A.A.S, F.A.I.A., is the Guest Speaker.

Further information from the M.A.A.S. Secretary, Mr A. E. Allopp, 30 Cubley Road, Hall Green, Birmingham, 28.

Dates for Your Diary
7th May. CHELSEA A.S. Open Show at Chelsea Community Centre, 53 Kings Road, London S.W.10. Benching: 1.30-3.30 p.m. Prize-giving: approx. 7 p.m. Show schedules are available from show secretary Mr. R. Cox, 42 William Purcell House, Bagleys Lane, London S.W.6.

7th May. TROWBRIDGE & D. A.C. First Annual Open Show (12 classes) at the Newtown Junior School Hall, New Town, Trowbridge, Wilts. Show secretary: Mr. C. G. Pearce, 61 Alfred Street, Westbury, Wilts.

8th May. MIDLAND ASSOCIATION OF AQUARISTS’ SOCIETIES Annual Convention and Open Show at Moseley Secondary School, College Road, Moseley, Birmingham. Schedules from show secretary Mr. J. Edwards, 34 Veronica Close, Selly Oak, Birmingham.

14th May. HENDON A.S. 21st May. CARDIFF A.S. First Open Show at the Drill Hall, Park Street, Cardiff. Show secretary: Mr. N. J. Counsell, 25 Llanmorol Road, Gabalfa, Cardiff.

21st May. WIMBLEDON & MERTON A.C. at Holy Trinity Hall, The Broadway, Wimbledon.

4th June. CATFORD A.S. Open show at Holbeck Road School, Catford. Further details from show secretary: Mr. K. D. Owen, 42 Elmers Road, Catford, London, S.E.6.

4th June. FEDERATION OF BRITISH AQUATIC SOCIETIES Assembly.
11th June. BRIGHTON & SOUTHERN A.S. Show at Ralli Hall, near Hove Station.
11th June. LLANTWIT MAJOR A.S. Show at the Town Hall, Llantwit Major (entries from South Wales societies only). Further details from Mr. R. S. Wigg, 17 Ham Lane South, Llantwit Major, Glam.
11th and 12th June. International Tropical Fish Exhibition organised by the FANCY GUPPY ASSOCIATION and the BRITISH KILLIFISH ASSOCIATION, Drill Hall, Manchester, Ardwick Green, Manchester. Saturday 12 noon-8 p.m., Sunday 10 a.m.-7 p.m. Show organiser: Mr. R. Beresford, 99 Valley Road, Arden Park, Bredbury, Cheshire.

2nd July. BRACKNELL & D. A.S. Open show at Victoria Hall, Bracknell, Berkshire.
9th July. BASINGSTOKE & D. A.S. Annual Show. Details awaited.
10th and 11th July. BOMFORD & BEACONTREE A.S. Dagwortham Town Show. Show secretary: Mr. J. M. P. Eyre, 3 Ashvale Drive, Cranham, Upminster, Essex.
30th July. BARRY A.S. Annual Show at Holton Road Primary School, Barry (entries from members only). Further details from show secretary Mrs. E. Steer, 160 Inverness Place, Cardiff.


3rd September. FEDERATION OF BRITISH AQUATIC SOCIETIES Assembly.
3rd and 4th September. NOTTINGHAM & D. A.S. Third National Fish Show at the Drill Hall, Derby Road, Nottingham. Show secretary; Mr. W. J. Christian, 40 Moor Lane, Bunny, Notts.

4th September. September Convention of the FEDERATION OF SCOTTISH AQUARIST SOCIETIES at The Good Templar Hall, Gray Street, Broughshane Ferry, Angus. Host Club: DUNDEE A.S.

17th September. NEWPORT A.S. Annual Open Show at the Drill Hall, Stow Hill, Newport. Classes (24) include one for marine fish. Show secretary: Mr. M. J. Perry, 43 Western Drive, Gabalfa, Cardiff.

18th October. STONE A.S. Open Show at the Walton Community Centre, Stone, Staffs. Schedules available shortly from the show secretary Mr. K. J. Harvey, 61 St. Vincent’s Road, Stone, Staffs.

29th and 30th October. BRITISH AQUARISTS’ FESTIVAL at Bella Vue, Manchester. Enquiries to show secretary: Mr. G. W. Cooke, Spring Grove, Field Hill, Batley, Yorks.

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