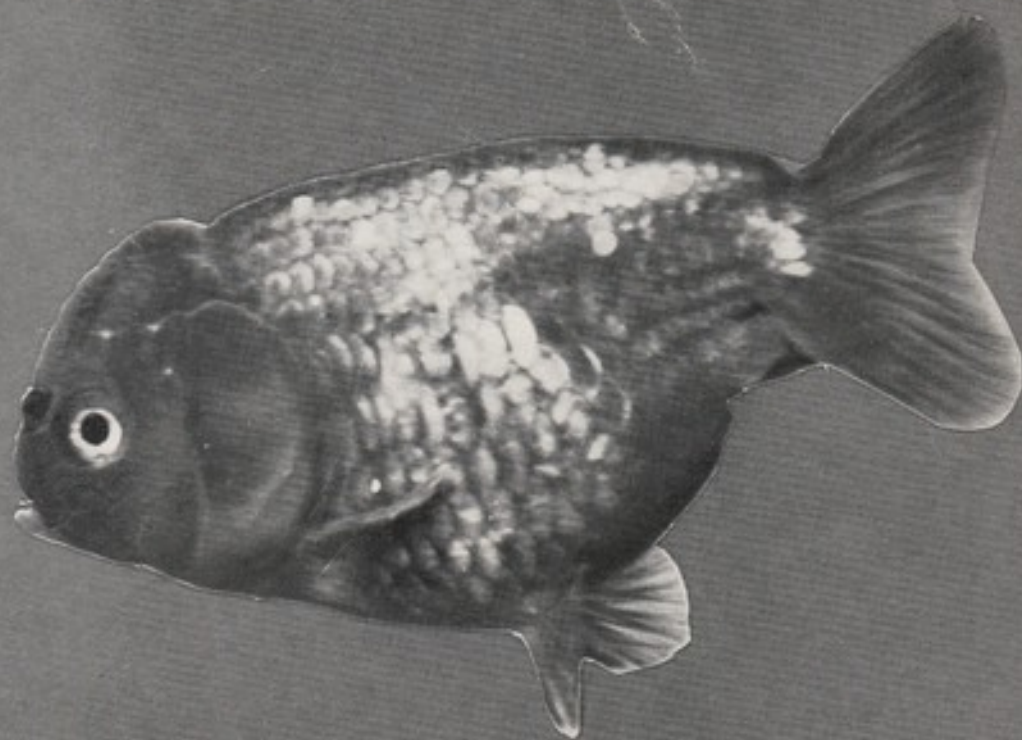


SEPTEMBER, 1966

2s 6d

# Pet Fish

monthly









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### In This Issue

	Page
Comments and Quotes	165
Letters	166
Two Egglayers that won't be put off by Hard Water	169
A Fish with a Double Colour Pattern	171
And now—the Mini- Tank	172
Readers' Queries	173
Fish Parasites in the Natural Environment	174
Personal Comment	175
PetFish Photo Compe- tition	176
Aquatic Ferns	177
Goldfish without Dorsal Fins	178
Mr T. W. Glass at Home	180
Transatlantic Topics	182
The Bleeding-Heart Tetra Obliges but—	183
Water Plants and Special Compost	184
Club News	185
Dates for Your Diary	189

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## Comments and Quotes

- Ghosts in tanks
- 'Expo 67' aquarium

fish to discover for himself just why they were called 'educated'!

### 'Rare Fish' on Display

SEVERAL newspapers recently printed the story of the aquarium dealer who had marked one of his tanks as containing rare 'ghost fish' and explained air bubbles to be seen rising in the water as the only evidence of their presence. Although the tank was in fact devoid of fish life the spectacle of nothing where there was an alleged something apparently proved to be a good draw for a short while, although it was not reported that anyone was actually allowed to take away one of the rarities in a plastic bag.

Anyone who has had anything to do with public exhibitions of aquaria will know what extraordinary flights of imagination are shown by members of the public trying to identify some tank inhabitant indicated by a label unintentionally left on an empty aquarium. If water fleas are to be seen, or some tubifex are waving about in the gravel, these are always certain to be identified by some knowledgeable family guide as the *Aphyosemion australe* or whatever it is that the label shows. Inaccurate labelling or out-of-date labelling of exhibits is, of course, something to be roundly condemned in public aquaria, but that's another story.

The ghost fish episode recalled to us the little joke of a well-known personality in the hobby who has a tropical fish shop in Glasgow. One of his tanks of guppies was labelled 'Educated Guppies'. Any requests for an explanation of the description were met by an invitation for the questioner to purchase some of the

### Gigantic Canadian Aquarium

A GIGANTIC aquarium, which may prove one of the main attractions of next year's World Exhibition 'Expo 67' in Montreal, is to be the joint venture of Aluminium Company of Canada (Alcan) and the Montreal city authorities.

Located in La Ronde area, on the down-river part of St Helens island, the impressive £700,000 showpiece is to remain as a permanent fixture long after the bustle of the 1967 world shop-window has died away.

Designed by Montreal architect George F. Eber, the exhibit will consist of two main structures—the Alcan Pavilion, housing 23 separate aquaria, and the Alcan Dolphin Pool.

The design of the two buildings consists primarily of a composition of cylindrical shapes of varying heights arranged to create an overall sculptural effect reminiscent of ripples created by the dropping of a pebble in water.

The pavilion housing the aquarium is constructed of concrete walls and roofs. Members of the public will enter the building through a penguin area where the birds live under Arctic conditions, while viewers enjoy air-conditioned comfort.

The Alcan Dolphin Pool—in a separate cylindrical building—will be Canada's only indoor pool for performing dolphins, with maximum spectator viewing from 900 surrounding seats.

An unusual feature of the arena is the roof, which comprises two sets of spirals rising towards the centre, rotating in opposite directions. This twisted, conical shape is further enhanced by an exterior cover of bronze anodised aluminium sheeting.—(*Building Industry News*).



# LETTERS

## A Criticism Answered

MAY I please reply to Mr G. C. B. Thompson's letter in your August issue. Having some little knowledge of the F.B.A.S. I would only comment, without wishing to be rude to Mr Thompson, that he appears to be an official of a comparatively newly founded body of aquarists, or that he is also a newcomer to the hobby.

I would also suggest that Mr Thompson takes a little time to look up the records and he will find some really magnificent work has been done by the F.B.A.S., particularly when the hobby was very much in the doldrums after the last War and in the following years.

I would also stress that if Societies would only use a little imagination and consider things correctly, the solution will lay in their own hands.

The F.B.A.S. has a very excellent list of qualified judges and lecturers, who have always been prepared to travel practically anywhere to further the hobby. As most of them are also hardworking chaps, overnight stays are difficult to overcome. The F.B.A.S. already sets the fashion of using Saturdays for their Assemblies, to enable the greater majority of delegates to attend. Why cannot Societies do the same?

'20 miles radius from Charing Cross?' This is utterly ridiculous. My own records show that, in the past, I have travelled as much as 2400 miles in 12 months, to visit Societies, all of which has been completed by public transport. What is further, my profession has not been neglected.

Mr Thompson, if a realist, should now know what the solution to his problem is.

Ruship, Middx.

R. O. D. LIST

## Aeration

IN answer to the letter about aeration in your June issue, may I quote from my own experiences. I have kept two 36 in. tanks for a number of years, one a well-planted community tank and the other a tank containing larger fishes including at one time blue acaras and tinfoil barbs. I also had a small unplanted tank kept for quarantine purposes. The community tank has never been aerated or filtered and keeps very clean. When I set up the tank for larger fish I did not anticipate getting an aerator but I gave up trying to keep plants growing and the water quickly became murky, with the fish mouthing at the surface. Two internal filters were added and an air stone, served by one small air pump, and there has been little bother since. I also run an air stone in the unplanted quarantine tank as aeration seems to be particularly important if the water is heavily coloured with methylene blue.

High Wycombe, Bucks.

R. GRANT

## Which Hormones?

I WAS very interested to read the report of the annual general meeting and judges' conference of the Fancy Guppy Association (PETFISH MONTHLY, June) and in particular to learn that 'although the F.G.A. does not debar the use of hormones, it does discourage the use of those of which little is known'. This seems to me to be rather vague: 'of which little is known'—does this mean the scientific aspects of the hormones or the use of the hormone in relation to fish; and known by whom—by scientists in general or by aquarists in particular? I would be very glad to read in your magazine a list of the hormones whose use is allowed by the F.G.A.

Sheffield.

B. BARBER

## From Small Beginnings

AQUARISTS in the Southend area must be amongst the keenest in the world, for in the SOUTHERND STANDARD the following advertisement appeared recently: 'Tropical fish tank, 25 ft. x 16 ft. x 12 ft., complete stand, fish plants, heater; £4. Southend . . .'. The mind boggles at such a magnificent aquarium at such a bargain price. One wonders what sort of fish are included in the set-up; presumably they would need live food in the form of a dozen or so Jack Dempseys a day!

T. F. CAPON

Southend, Leigh & D.A.S.

## Fry Food is Egg-shaped

READING Mr Mellor's account (PETFISH MONTHLY, June) of his accidental experiences of rearing fry with evaporated milk reminded me of an amusing observation that I made this summer.

We were on a boating-cum-camping holiday on the upper part of the Thames, and after a snack of scrambled eggs I had emptied plates bearing small remnants of the egg

over the side of the moored boat into the river. A little while later I happened to look into the water and was astonished to see thousands of tiny fish fry swarming at the surface in the patch of cloudy water foamed by the addition of my bits of scrambled egg. These were really tiny fish and obviously preferred this unexpected donation of food to the live foods that must have been abundantly available to them. This made me think that perhaps I was doing my fry at home rather better than I had thought in giving them the fine particle food sold for fry raising in place of live foods.

London, W.2

R. TURNBULL

## Aquarium Ornamentation

MAY I spring to the defence of those buyers of the Mdivers, treasure chests etc. mentioned by Arpee in his 'Personal Comment' for August. I think he has been too hard on those who do add such items to their tanks.

Continued on page 170

Prize  
Letter



# "SUREGROW" DISEASOLVE

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tropicals

## Part 5 Two Egglayers that won't be put off by Hard Water

By D. B. McINERNY

(McLynn's Aquarium)

TWO beautiful egglaying species that are among the fishes which prefer hard water for breeding are *Telmatherina ladigeni* and *Bedotia gausi*. Both are continually in demand, and if the aquarist is lucky enough to raise more than he requires he will have no difficulty in selling the surplus at a reasonable profit.

*T. ladigeni*, which comes from the Celebes, is very susceptible to changes of water. When buying these fish get sufficient water in which they are living to be able to house them in your own tank. You are unlikely to be able to get more than a small plastic bagful of this water; therefore, so that a sufficient depth of water can be provided in your own tank use one not more than 24 in. by 8 in. by 8 in. Supply aeration.

### Acclimatise to New Water

To acclimatise them to the hard water you have available add not more than a 1 lb. jam jarful each day. This, of course, must be at the right temperature. Once you have the fish in sufficient water to fill a 24 in. by 8 in. by 8 in. breeding tank plus enough over to half fill another tank, of the same size, you should be well on your way to a successful spawning.

Sexing is easy, as the males are not only more colourful but have much longer rays in the posterior, dorsal and anal fins.

If your fish are sexable and the females moderately full of roe, select one male and two females for spawning; put any others over into the second tank. Now put well-washed sand in the first tank and plant separately into this single stems of *Myriophyllum*, each about an inch and a half apart, and place the breeders into this. The male will begin to chase the females and expand his fins as he displays in front of them. At this time his appearance is most striking, as his long-rayed posterior dorsal and anal fins are stretched to splitting point.

### Eggs on Thread

Next morning carefully examine the stems of *Myriophyllum*. You may see clear eggs, dangling on the bottom of a sheet thread which has been caught on the fronds of the plants.

If you are able to divide the tank with a piece of glass

or perspex, wedged in place by channel rubber, so that any fry are safely separated from the parents, do this now. Otherwise take a square sweet jar of the same water and stand this in the second breeding tank, if there are other fishes in it. If not, of course, the eggs can be transferred straight into this tank for hatching. Pull out very gently any stem of *Myriophyllum* in which eggs are seen, and place the whole stem in the divided portion of the tank, or in the jar or the second tank.

Note that if the *Myriophyllum* had originally been planted in a bunch instead of individual stems, pulling out one or two stems with eggs would be almost impossible. Not only would the whole bunch become uprooted so that the remainder of it would have to be replanted, but many eggs would be lost.

Feed the parents daily to prevent them from eating any eggs which have been laid, and so that they may continue spawning for five to seven days. If you have more *Myriophyllum* to spare, replace any stems taken out with fresh stems, and these may well receive more spawn the next day. (Spawning will continue daily until the female has run out of eggs.)

The transferred stems of *Myriophyllum* need not be planted. Just leave them floating or half-sunk. Watch these carefully; if any eggs are attacked by fungus add a few drops of methylene blue solution to tint the water a pale blue.

### Care of the Fry

On the third day after the eggs were laid the eyes of the embryo will be seen in the eggs. The eggs hatch in five days. The fry will be seen hanging in a perpendicular position amongst the plant fronds for two days. Of course, if eggs laid on subsequent days are added to this store daily, some will now be half-developed whilst the latest ones are still quite clear.

The fry are free-swimming eight days after the egg is laid, and these will require a good supply of Infusoria. Eggs will continue to hatch for another week so Infusoria must be supplied regularly. After a further week add newly hatched brine shrimp to the diet of the fry, and a week later a small amount of microworms. Once past

Continued on page 172



## LETTERS

Continued from page 166

I do not myself use them but I have seen tanks made most attractive with coloured gravel and the well placed ornament, and whole underwater fantasies carried out with various figures. The sight of them gives enormous pleasure to those in whose tanks they appear and after all that's what we're engaged in this hobby for, I think. Let's keep both Bach and the Beatles. Furthermore, as a woman, I'd be definitely put off by the thought of a 'simple (even crude) lay-out created from raw materials' in my sitting room. Give me the expensive tank equipped with a plastic background on a wrought-iron stand!

Morden, Surrey

(MISS) A. SHELLEY

### Lecturers Wanted

FROM letters received from secretaries of other clubs and from my own experience it is getting very difficult to find lecturers willing to come along to talk to us at meetings. Would it be possible for you, through the medium of PETFISH MONTHLY, to get a list of names and subjects?

S. HEATH,

Romford & Beacontree A.S.

We will be pleased to hear from speakers who are able to accept lecturing engagements. Details of subjects offered, availability, fee required and area of travel will be useful for information to be made available to interested societies.

—EDITOR.

### 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.

## A Fish with

ALTHOUGH the majority of tropical fish species have a quality or habit that deviates from the customary expectations in a specific type of fish, occasionally some species is discovered that has one or more outstanding features that are immediately of interest to the aquarist.

The golden pencil fish (*Nannostomus anomalus*) is one such species within this category because it enjoys a Dr Jekyll and Mr Hyde complex in that it has two distinct coloration patterns—one for the daylight hours and another for the hours of darkness.

The coloration pattern displayed during the daylight hours is quite attractive: the olive-green back and the contrasting white of the lower half of the body is equally split by a broad black stripe running from the tip of the snout through the eye to the commencement of the caudal fin. The upper edge of this black stripe has a vivid light-gold stripe that is quite iridescent when viewed from certain angles. All the fins are hyaline, with the dorsal, caudal and anal fins having brilliant red splashes. An additional decoration in the males is that the ventral fins have a blue-white tip with the same coloration appearing as a distinct spot on the tip of the anal fin.

### Protective Colour Change

After being in darkness for several hours, when the light is suddenly turned on this fish will be very difficult to recognise as the whole colour pattern has changed to a vastly different design. It now has an overall body coloration of a lightish pink that is interspersed with four vertical patches of dark bluish brown. This pattern for darkness indicates that the areas to which this fish is indigenous have aquatic vegetation of the reed-like varieties and it must be assumed that it is a form of protective camouflage.

Indigenous to the Amazon Basin and throughout British Guiana, the golden pencil fish reaches a length of two inches when mature. It is a very peaceful fish that is also inclined to be nervously shy and therefore should never be placed with fishes that are larger. Undoubtedly they are seen at their best when kept as a separate collection.

Although these fish are not too difficult to spawn, great care must be exercised in assuring that the water conditions are correct. The pH should not be less than 6.6 and the hardness should not be higher than 4 degrees. Although normal tap water may be used there is no guarantee that the fish will spawn in this type of water even when it is chemically treated to give the desired conditions. For success it is recommended that 30% of tap water be used to 70% distilled water, and to bring this mixture to the correct acidity a small amount of peat moss can be enclosed in a fine cloth and suspended in the aquarium water until the water test gives pH 6.6.

The aquarium should be around the 5 to 7½ gallon size and should be very densely planted with any of the



# a Double Colour Pattern

By W. L. WHITERN

following aquatic plants—*Hygrophila polysperma*, *Cabomba caroliniana*, *Ludwigia natans* or *Myriophyllum hippuroides*. The breeding aquarium should be located in a spot away from normal everyday passing traffic; if this is impossible, then the front and side glasses should be covered with a heavy brown paper. The front paper should have a sort of peep-hole of the flap type that can be immediately replaced after an inspection of the aquarium has been made.

The overhead lighting should be subdued and preferably the daylight type of bulb of low wattage should be used. It is also advisable to have a very fine aerating stone that disperses very small air bubbles and this should be kept operating constantly.

## Communal Breeding

Although many aquarists will prefer to endeavour to spawn these fish with a single pair, the better method is to use the communal system in which three males and four females are placed in the breeding aquarium.

The actual spawning will not take place immediately but once a female has commenced to deposit her eggs she will continue to do so for three or four days and these are scattered among the fine foliage plants. If these fish are fed well, that is a nutritious dry food is given several times a day, there is very little likelihood of them eating the eggs.

The eggs hatch in 48 hours and the young fry hang on to the nearest leaf for the next two days, after which they become free-swimming. The young fry are very difficult to see until they are at least a week old but the denseness of the aquatic plants is usually considered sufficient protection from the other mature fish in the aquarium.

Far too often the water in the aquarium is maintained



Photo:

Golden pencil fish

B. PENGILLEY

at too high a temperature and the young fish do not survive; the water should be maintained at a steady 72°F (22°C).

Although the usual procedure is to feed with Infusoria for the first few days there is always the tendency to give too much to the extent that it will eventually foul the water. A much safer and preferred method is to add two drops of homogenised milk per gallon of water; do not add any further until the water is again clear. The water clearing indicates that the milk is being consumed.

One basic requirement, and one that most aquarists overlook, is that after the young fry are one week old, they should be given a late night feeding just before the lights are turned off for the night. The best type of food is a very finely ground dry compound such as the shops stock for fry feeding.

After three weeks it is advisable to introduce the young fry to live food and this is best undertaken by feeding the small miniature white worms or more preferably scraped raw frozen chicken liver. This latter type of food has been found unsurpassable; it is very economical and the fish apparently find this very palatable.

Spawning these fish as already recommended, that is using the communal system, a spawning aquarium can be kept operative for the whole summer and the only requirement is occasionally to remove some of the young fry to a larger aquarium to permit quicker growth and give them more swimming room.

## Two Egglayers that breed in Hard Water

Continued from page 169

this stage the fry will eat fine dried food, and you should have no further difficulty in raising eighty to a hundred beautiful fish. Be careful when selling these; if they are transferred to water which has a different pH or hardness reading, the purchaser may come back to you a few hours later to complain that the fish you sold him have all died!

### Bedotia geayi

*Bedotia geayi* is another pretty species, which comes from Madagascar. It is rather larger and more elongated, but quite as peaceful as *T. ladigesii*, and similarly has a double dorsal, though the anterior one is rarely raised. The overall colour of both species is a golden yellow. *B. geayi* is more difficult to sex, and generally has to be an inch and a half in length before sex is discernible. Then the male's dorsal fin is slightly longer and more pointed, and he will develop more black in the caudal

fin; and in some good specimens this will be encircled with a bright red around the outer edges.

*B. geayi* is not so touchy about water conditions as *T. ladigesii*, and for spawning requires a slightly lower pH and slightly softer water. Success can be achieved between pH 6.0 and 7.2, and hardness 80-100 p.p.m. The method described above for *T. ladigesii* can be used for *B. geayi*. Both species lay eggs which dangle from a short thread which catches among the fronds of *Myriophyllum*. The adults spawn over a period of days and the eggs may be taken away as before. The eggs of both species hatch in approximately the same period, and the feeding for the fry is similar in both cases.

For those who do not have two breeding tanks spare, a successful spawning of either species can be achieved by providing in the breeding tank several thick clumps of *Myriophyllum* planted in the sand as spawn-receivers, and then leaving the parents in the tank for four or five days, making sure, of course, to provide them with sufficient food so that they do not become hungry enough to eat their own spawn. After five days the parents should be removed before the first eggs hatch, as the tiny fry are liable to be eaten.

This method rarely produces as many young as the one in which the eggs are removed, but if the aquarist has insufficient tank space it is never wise to attempt to raise more fry than he can house with ample room for growth and development.

## And now— the Mini-Tank!

IT had to come! And not just because these are the times for mini-everything, including (some would say) mini-fish. However much the infrequency with which displays of furnished aquaria are seen these days at shows may be bemoaned, it must be admitted there are undoubtedly serious difficulties about staging fully set-up tanks for a show lasting only a day or half-day.

This is why the mini-tank has found a place, whether it be a small light-weight aquarium of a gallon or two capacity or a show jar holding only about a quart. Although the purists will complain that these when 'furnished' cannot at all meet the requirement so rigorously demanded for the large furnished tank, that of permanency, they can be attractive

features in a display consisting otherwise of row upon row of jars holding only fish and water.

Much of the skill required for making a furnished aquarium is needed for the mini-tank as well, if it is to be a pleasing one, and certainly artistic ability is called for. Gravel and stone can still be matched, plant colours balanced and fish selected that will be set off well by the whole.

Judging the mini-tanks is a far easier task for the judges, for whom time is also precious in a short-lived show, but as one judge has said, they are equally as fascinating, attract an enormous amount of attention from the public and have 'come to stay'.



Photo: T. L. DODGE

A decorative 'mini-tank' containing a pair of harlequin fish entered in the Coventry show this year by Mr W. Edden of Leamington A.S., who was awarded first for it.





### Disinfection of Water Plants

*I have often read that 'disinfection' of plants should be carried out before their use in breeding tanks. What method of disinfection should be used?*

If the plants to be used are being taken from a tank that has been set up for some time and in which the fish are known to be healthy there is no need to give any special treatment to the plants. If, however, they are new plants or from a suspect source they should be washed well in water at the same temperature as that in which they are normally grown and then immersed in one of the following solutions: potassium permanganate dissolved in water to give a deep pink colour or dilute Detol solution (10 drops per gallon) or dilute domestic bleach solution (5 drops per gallon). The last-named treatment exposes the plants to free chlorine and should not be more than a brief immersion. With any of these disinfecting procedures plants should be washed thoroughly in clean water after the chemical treatment and before being placed in the breeding tank.

### Metals and Pond Fish

*I have just bought a new jet made of brass for the fountain in my garden fish pond to replace the original plastic jet. I was assured by the salesman that the metal would not harm the fish but since I have been told that the use of the brass jet would be unwise. I have noticed, when cleaning the submersible fountain pump, that it contains copper in the electric motor and this does not appear to harm the fish.*

It is true that brass in contact with water can release poisonous quantities of copper salts. Provided that the pond is a large one it is unlikely that a single new brass jet would in fact cause sufficient contamination of the water to be harmful to the fish. The copper present in the electric motor doubtless does not make contact with the water at all. Troubles usually arise when long

lengths of copper or brass pipe are used in small ponds, and it is particularly from new piping that metal is released as protecting coatings form after a period of use in water.



Angel fish with eggs on leaf of Amazon sword plant

### Angel Breeding Behaviour

*I have a pair of angels, one 4 in. long and the other 3 in., which bred recently. Just before laying the eggs, the smaller angel kept butting the side of the larger one. No mark was left afterwards and I do not know which fish is the female and which the male. I have never seen any mention of this procedure in any literature and would like to know whether this is some form of courtship or whether it is a peculiarity of my pair of angels.*

The behaviour described is not unusual between pairs of angels during the spawning period, both before the actual spawning and after (the same behaviour often takes place immediately after their eggs have been removed from the tank after fertilisation). This kind of 'butting', usually performed by the male fish, does not at all resemble the fighting

that can occur between two males, and the fishes remain undamaged. It should certainly be possible to distinguish the female fish well before spawning takes place. Seen face on, the female fish will appear much plumper than the male in the lower depth of the body; when spawning is imminent the breeding 'tube' becomes an obvious feature protruding from the vent of the fish.

### Adhesive for Glass

*I have constructed a 24 in. by 12 in. glass tank using an epoxy resin as an adhesive. This has proved to be extremely strong and waterproof, but is there any possibility of the adhesive proving toxic to the fish?*

It is most unlikely that any significant quantities of water-soluble substances would come away from the adhesive used and the fish should be quite safe. The tank should be rinsed out with warm water once or twice after the resin has set and again before it is finally filled. This will remove any trace amounts of soluble substances.

### Bladderwort

*Is there any objection to the use of bladderwort in an aquarium with young egg-layer fry? The plant seems ideal to use for top cover.*

It all depends on what is meant by bladderwort and on the type of egg-layer fry! At least two species of

*Continued on page 181*

## Readers' Queries

QUESTIONS on fish-keeping from readers of **PETFISH MONTHLY** will be answered by post if accompanied by a postage-paid addressed envelope for reply. A selection of answered questions will be published each month. It is regretted that queries cannot be answered by telephone. Address letters: **Readers' Advisory Service, PETFISH MONTHLY, 554 Garratt Lane, London, S.W.17.**

# Fish Parasites in the Natural Environment

**B**EFORE we consider the occurrence of parasites in a pond or tank, it is a good idea to consider their place in the natural environment. In this way, we can gain some idea why parasites are found under artificial conditions, and how measures can be taken to prevent their introduction.

We must examine factors which are of importance in determining the characteristics of an aquatic, or indeed, of any environment. The factors may be conveniently grouped under several major headings. In the first instance the physical and chemical features of the environment, and of its surrounding area, are important. Thus, for example, a pond in a richly farmed countryside will tend to be rich in mineral salts, derived from the soil of the surrounding land. On the other hand, a moorland pool, surrounded by poor mountain pastures, will tend to have a low content of mineral salts, because of the poorness of the neighbouring countryside. The initial form of the environment is important in determin-

ing the types of plants and animals which will occur, although later the environment may be modified in character, by the presence of plants and animals.

Colonisation by plants and animals occurs very quickly. Some years ago a large hole was dug in a clay field to remove an unexploded bomb. The hole was not filled in, and quickly became full of water. Within weeks, algae started to grow, soon after rooted aquatic plants appeared, and in about one year a rich fauna of insects, worms and other animals had developed. Later fish were introduced, and this hole developed characteristics similar to all the other ponds, or pits, found in the area.

The communities of free-living plants and animals are of extreme importance. Their origin is partly determined by the physical and chemical characteristics of the area. In addition the geographic location is very important. One would naturally expect a different flora and fauna to develop, even if two identical ponds were prepared, if one was in Britain, and one was in Africa.

By **Dr JAMES C. CHUBB**

*The University of Liverpool*

The geographic location determines the types of plants and animals available to colonise the environment. Subsequent development of the form of the communities and succession of species within the environment occurs, but usually a general trend is recognisable within any particular type of environment and geographic region.

Thus, if we look at the flora and fauna of a small mountain stream in Wales, and of a similar mountain stream in the English Lake District, we shall find very many resemblances between the two. Naturally there will be some local variation. On the other hand, if we look at a river flowing over limestone countryside in Yorkshire, and compare it with a river of similar size flowing over acid rocks in Wales, we shall find rather more differences than similarities, because in this case we shall be dealing with two rivers having different chemical characteristics. Even though they may be separated by only a few miles, the plants and animals



Llyn Teyrn, 1238 feet above sea level, on the eastern side of Snowdon. Situated in high mountains, it is a 'poor' lake. Until recently it had only a small population of brown trout, but it is now being used for experimental salmon parr rearing. The lake has a very restricted parasite fauna



Llyn Tegid (Bala Lake), 533 feet above sea level. A lake of 'intermediate' type, fed by streams flowing from sheep pastures. It has mixed populations of game (salmonoid) and coarse fish, which support a wide range of parasite species



Rostherne Mere, Cheshire, 68 feet above sea level. A 'rich' lake, surrounded by good quality pasture. It has a population of coarse fish, with a parasite fauna typical of these fish



found will tend to differ quite markedly, although some species will occur in both types of habitats.

Now why is it so important to discuss free-living plants and animals? After all, we are supposed to be talking about parasites in the natural environment! However, before we answer this question we must consider what a parasite is, and how it lives.

A parasite may be conveniently described as an organism which lives in or on another organism, its host. From this host plant or animal, the parasite obtains its food and living quarters.

Now many parasites are quite specific in their choice of host. This phenomenon is called host specificity. Clearly, if a parasite is specific to a limited range of hosts, and then the host is specific to a limited range of habitats or environments, we shall only expect to find the parasite in a locality in which its host also occurs.

In effect, on the free-living plants and animals in any and every habitat, there is a superimposed parasite flora and fauna. The term superimposed is used to emphasise the dependence of the parasites on their free-living hosts. Every species of parasite is host specific to a greater or lesser degree. The development, or restriction, of variability of this specificity will markedly affect the distribution of a parasite.

In other words, the entry of a species of parasite to a water, be it lake or river, pond or aquarium, must be made with the necessary hosts of that parasite. For the establishment and success of the parasite in the water, all the hosts necessary for the completion of the life-cycle of the parasite must be present.

Thus, just as a free-living plant or animal is dependent on the external conditions of the environment, so a parasite is additionally dependent on the presence of the range of hosts it is able to enter, survive and reproduce in. This is the most important factor which will determine the distribution of parasites.

The complexity of the life-cycle of a parasite, i.e. the number of different hosts required for the successful completion of the cycle, and the degree of specificity of the parasite at each stage of its development, will also affect the distribution of a parasite. Life-cycles of parasites will be discussed more fully in a later article, but it can be stated here that the more complex the life-cycle, the less chance there is of a parasite becoming established in an artificial pond or an aquarium.

Finally we may note that in natural populations of plants and animals parasites are always present. The parasites are normally in equilibrium with the communities of free-living plants and animals. In general the presence of parasites has little harmful effect, and they will not be noticed by a casual observer.

However, if some unusual event occurs in an environment, of natural or human origin, the equilibrium between host and parasite may be disturbed, and an epidemic of one or more species of parasites may occur. In natural populations regulating mechanisms in the environment soon come into play, and a new equilibrium is established. But in the intervening period there may be a serious damage to fishes or other members of the environment.

In the next article we shall consider how parasites may occur in artificial pond and aquarium habitats.



by ARPEE

FOR the beginner about to set up tank for the first time there is a bewildering amount of literature on the subject, and he can hardly go really wrong if he does just what he is told. Unfortunately the aesthetic appeal of the finished product is so often very limited because scenic arrangements are more than a little difficult to put across in print. In some books there are little black and white sketch plans, with rocks and plants all merrily numbered against a key at the foot of the page, but more often than not things go awry because the writer omits to tell you how to keep three large rocks in place against a shifting bank of sand whilst holding a choice *Cryptocoryne* and two planting sticks in just the two hands with which we are provided.

Apart from the purely physical disadvantages of the planned lay-out, there is the distinct possibility that every third tank you see will look alike, from which disagreeable concept I will move rapidly. The charm of any tank lies in its originality, and I would suggest that the new aquarist takes a leaf from the book of Beverley Nichols who, in his magnificent gardening sagas of the thirties, passed on some invaluable advice to those faced with the problem of filling up and maintaining a garden. One of his methods was to stick broomsticks or canes, cut to appropriate lengths, into the ground in the position proposed for each new tree or shrub. He would then survey the situation from all angles and move the sticks around until the overall symmetry satisfied his critical eye.

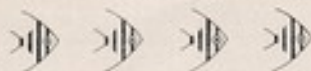
On a smaller scale this is possible in aquaria, particularly the bigger ones, but the advantage we aquarists have over the gardener is that the plants are rather cheaper, more easily moved around to gain the optimum effect, and the work is considerably less backbreaking. The point I am making is that the aquarist should experiment, experiment, and experiment again with the plants and rocks he has bought for his first tank. The eye is easily satisfied with the most uninteresting arrangement on first glance, but don't let this fool you into accepting the first of your attempts, for in all probability you will get sick of it within a week. By all means allow space for the addition of choice plants which you will later find you cannot resist; to plan with this in mind will just hold you back from tearing the tank to bits when you see some of its most hideous features whilst lazing in your chair on a wet afternoon.



I was very pleased to read Mr C. D. Roe's notes, in the June issue, on the subject of *Blyssa japonica*, which seems to be a grossly underestimated plant. I sent away for several specimens some 6 months ago when I was

in a state of being disgusted with most of the conventional plants I had, which were behaving abominably. *Blyxa* was an outstanding success in a not very well-lit part of one of my tanks; it contained rainwater, and had not long been set up. The plant shape and the attractive sheen from its variously coloured leaves has been overlooked by aquarists for all too long, and I very much hope that this is a plant which the trade will make more readily available to those who take the trouble to collect and use rainwater in their aquaria. I shall try to accustom a few specimens to less favourable conditions when my stock increases, despite Mr Roe's warning that this is not a hard water plant.

I would commend to the beginner that excellent work on plants entitled *A Manual of Aquarium Plants*, compiled by Mr Roe. It is a wonderfully well-produced volume, and one gets very attached to it after a while, since it really does seem to answer those awkward questions about cultivation, propagation and so on. In my experience it has to be read with Shirley Aquatics' price list alongside as few other firms seem to attempt to stock the ambitious range of plants described in the book. Not only do I like the plants supplied by this firm but also the way in which they are packed for postal delivery—in polythene sheeting contained in sturdy cardboard boxes. The practice of some suppliers of dispatching a handful of mud through the post, accompanied by a few plants and a casual coating of newspaper and string, is an abomination which the G.P.O. and the customer might combine in bringing to a speedy end.



Netting fish is an art, and some experienced aquarists can remove a male zebra from a four foot tank in under 4 minutes without breaking a blood vessel and uprooting all the plants. I have occasionally managed this, but it is not one of my favourite exercises.

It is true that two nets are better than one; the single

net, in fact, unless used with notoriously slow-moving subjects, is a positive menace, exhausting the chaser and the quarry alike, and with almost equal rapidity. Even two nets don't quite do the trick sometimes, and I have recently found that small clear plastic sandwich boxes are rather more effective in clearing a tank rapidly. If you lower them into the water gently, you will find that a number of fish are inquisitive, and swim into the box to investigate. A few others will follow, and at this stage, be content to lift the whole thing out and transfer the contents.

The majority of fish seem much less alarmed by this, possibly because they can see through the container, than by the net, which restricts their field of vision. This procedure is particularly useful when transferring small fish, since at no time do they stand much risk of being out of water, even briefly. I shifted two dozen White Clouds in about eight 'lifts' last week, with no casualties to fish, plants or rocks. The last time I performed the same operation with a net the tank was a veritable battlefield and had to be completely refurbished.



I should like to remind those of you who are kind enough to read this column, that it is not intended purely as a list of hints and tips, but as the birthplace for interesting, even if trivial controversy. If there is one thing the aquatic press lacks, it seems to me, it is the desire to put into print some of the grouses and grumbles—and sometimes the bouquets—which surround the hobby. No doubt the odd remark in this column will spark something off in the Letters section of the magazine, but other subjects may not, on their individual merits, justify inclusion there. I should therefore be delighted to hear from readers who want to get things off their chests. They probably won't get everything they say into print, but if we can stimulate discussion amongst ourselves or tell the trade how we feel about some of their habits, we shall at least feel better about things. Who knows, we might even get some results? Letters, then, as long or as short as you like, as soon as you like!



## PETFISH photo competition

Closing date 31st October

PHOTOGRAPHIC entry for PETFISH MONTHLY'S Photo Competition from Mr T. Payne, of Penkridge, Staffs. in the black and white category is reproduced here. Other categories of entry are for garden pond pictures in black and white or colour and fish or aquarium scenes in black and white or colour. An Entry Form is included on page 194 of this issue, and Rules and Conditions were printed in the April and May issues.



# Aquatic Ferns

By C. D. ROE

## Notes on the popular Indian fern, an introduction to one other and description of a first-time importation

FERN is a title rather loosely used by aquarists with reference to water plants, although to the botanist a definite group of types is indicated by this name. Two of the aquatic tropical plants to be discussed here this month are relatively familiar ones (the first, the 'Indian or Sumatra fern' being one of long-standing popularity), but the third is completely new.

*Ceratopteris* is the genus to which the Indian fern (*C. thalictroides*) belongs. Members of the genus are widely used by breeders of livebearers because the roots of the plants growing at the water surface offer marvellous protection for fish fry and also livebearers usually thrive under the conditions in which these plants flourish. Guppy

breeders in particular have favoured the use of the floating fern (*C. cornuta*) and Indian fern, their leaves being soft and therefore incapable of harming the large flowing tails of some guppy varieties.

Although they will grow in artificial or natural light, these ferns require full illumination if they are to keep the beautiful green colour they show. Young plants form on the old leaves and to accelerate their development it is best to separate the parent leaf from the plant and allow it to float on the water surface. When the young plants are strong they can be detached and planted individually.

One of the few true ferns that can be considered to be aquatic is *Microsorium pteropus*, from tropical

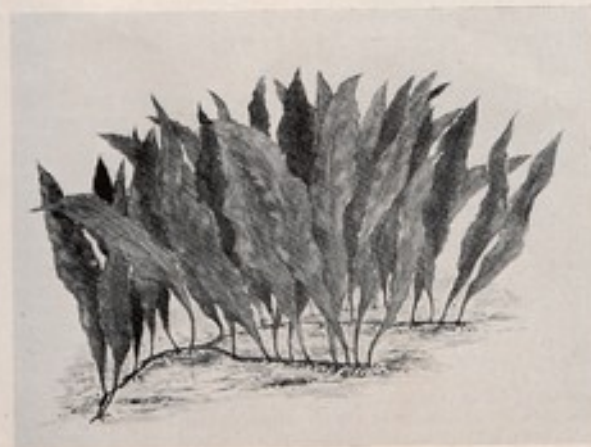
south-east Asia from India to Indonesia. Its broad fronds arise from branched creeping roots and have tapering bases and sharply pointed tips. A height of about 7 or 8 inches is the usual size reached under conditions of aquarium cultivation.

It is a plant that appears to do extremely well in tanks where *Cryptosyrne* thrive, and in quite poor light. I have one tank in particular where it has been multiplying steadily for some years, almost choked by *Cryptosyrne blausii*. If this plant is tied with thread to a piece of waterlogged wood it quite quickly attaches itself to the wood, and it is extremely decorative when growing on preserved wood which has been dug up from peat bogs. For best results in propagation it should be grown as a bog plant under warm, humid conditions. It multiplies by extension of the creeping roots and can also produce young plants on the undersides of its fronds.

## A New Importation

A new 'water fern' belonging to the same family (Polypodiaceae) as *Microsorium* is *Bolbitis heudelotti*, and I was fortunate to obtain specimens and information about this newcomer from M. J. Arnault, who collected it, and from M. B. M. France, both of the Association Française des Aquariophiles. A name formerly applied to this plant was *Gymnopteris heudelotti*. Its distribution is in West Tropical Africa from the Republic of Guinea, Upper Volta and Republic of Sudan (formerly French Sudan) and not

Continued on page 179



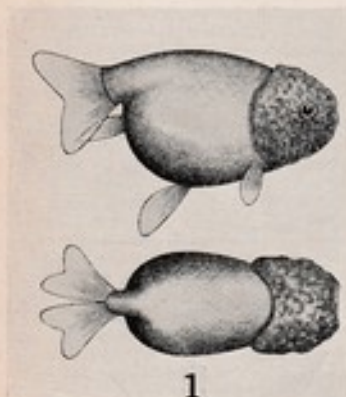
Indonesian fern (*Microsorium pteropus*) grows to a height of about 7 inches and does well under subdued lighting conditions

## STANDARDISATION OF VARIETIES OF GOLDFISH—4

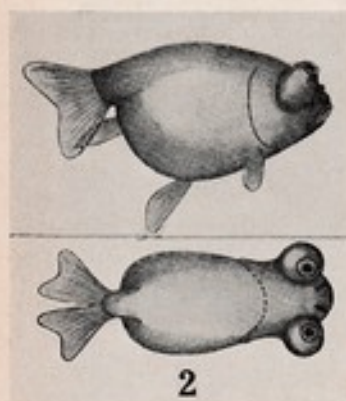
# Goldfish without Dorsal

By M. D. CLUSE

Vice-President, The Goldfish Society of Great Britain



1  
Bramblehead goldfish: the head adornment is the characteristic feature



2  
Celestial goldfish: the eyes protrude and are directed upwards

Absence of the dorsal fin is a feature that can be inherited and four types of goldfish with this genetical deformity conforming to Goldfish Society of Great Britain standards are seen on the show bench

A REMARKABLE genetical variation has produced fish without dorsal fins. At first sight these goldfish appear grotesque, but on further acquaintance they are found to have their own peculiar attraction. The lack of the guiding fin on the back influences the swimming movements and gives the fish a special 'personality'. The body is not quite so deep as in the twinstail or globe-eye because the back is not so humped. The Goldfish Society of Great Britain's standards call for a depth of three-fifths of body length ( $3/5 L$ ). The dorsal profile should be smoothly curved without a sign of any latent fin rays. The fins are short. The caudal fin is divided and the anal fin double.

### Four Recognised Varieties

There are four varieties in this group which are recognised by the G.S.G.B.

Fig. 1 shows the bramblehead (lionhead). This has a raspberry-like growth on the head, which should be covered completely except for the mouth and eyes. This is not a hairy growth like a lion's mane and so the old name 'lionhead' is rather a misnomer. A fully developed 'bramble'

is difficult to obtain and really good specimens seem to be rare in this country at present. The G.S.G.B. allots 10 points out of 100 for this special characteristic as follows:

- Development in cranial region — 9
- Development in infra-orbital region — 4 (infraorbital: below the eye)
- Development in opercula region — 5 (opercula: gill cover)

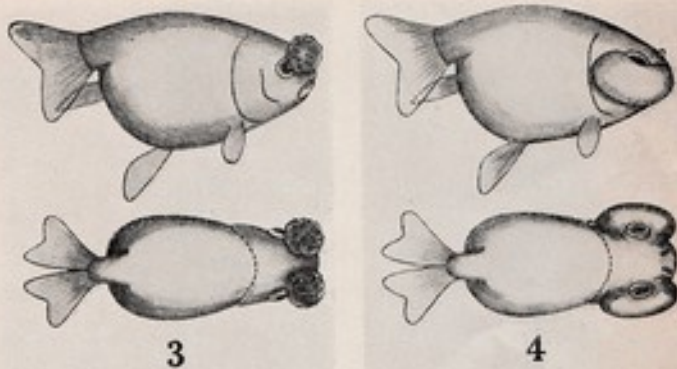
Fig. 2 shows the celestial, which has the special characteristic of protruding outward and upward-pointing eyes. The appearance of sky-gazing accounts for its name. Nineteen points are allotted for even development and direction of eyes.

Fig. 3 shows the pom-pom, which has the special characteristic of an extraordinary development of the tissues of the nostrils or 'nasal septa'. Nine points are allotted for development of pom-poms, and 10 points for matching of pom-poms. Good specimens of this gay fish are scarce.

Fig. 4 shows another astounding mutation known as the bubble-eye. Sacs filled with a jelly-like substance



## Fins



In the pom-pom (3) the nasal septa are prominent and the name of the bubble-eye goldfish (4) is self-descriptive

are anchored in the region below the eye. A common fault is uneven growth of the sacs, when one side grows more quickly than the other.

Nine points are allotted for development of sacs, 10 points are allotted for matching of sacs for shape and size.

(Diagrams used with this article have kindly been provided by the Goldfish Society of Great Britain)

## Aquatic Ferns

*Continued*  
*from page 177*

to be confused with the former (Anglo-Egyptian Sudan), south to Angola. It occurs, according to H. G. A. Alston, on spray-soaked rocks near streams and waterfalls, often submerged.

The fronds are composite with coarsely serrated edges, attaining a height of up to 12 inches and of mid- to dark-green colour. They arise from branched creeping roots, which become attached to stones or wood.

*Bolbitis* appears to require high temperatures and clear soft water, under which conditions it grows relatively slowly submerged. In my experience it grows better submerge than emerge.



A new aquatic fern (*Bolbitis heudelottii*) depicted growing on a submerged branch of wood

This plant readily attached itself to sunken wood or rocks and is really attractive. I have discovered no quick means of propagation, and

it is expected that it will be some years before it is in commercial supply. Unlike the other ferns it appears to be entirely sub-aquatic.



Mr T. W. Glass

WHEN I first tried to arrange to visit Mr Glass he asked me to give him time to finish the decoration and re-painting of his fish house on which he was then engaged. I happened to mention this to another aquarist who knows him, who exclaimed in amazement 'Painting? I was there only a month ago and it all looked perfect to me—easily the cleanest fish house I've ever seen!'. I soon discovered on my visit that perfection in fish-keeping is the constant aim of Mr Glass, whose maintenance of a spotless fish house is part of a policy that puts cleanliness high on the list of points to achieve that aim.

Fifty tanks of fish are arranged in three tiers along the sides and one end of his fish house in a garden at Notting Hill, London. Almost as soon as I began looking into them Mr Glass almost apologetically pointed out one 24 inch which might conceivably have been called a 'dirty' tank. 'They only breed with it in that condition' he said, indicating some highly coloured *Pelmatochromis assectus* in the aquarium, and showed me a flower pot in which their eggs had been laid and which he had removed to another clean aquarium.

Of wooden construction, the house is 12 ft. long by 6 ft. wide and is 7 ft. high at the roof apex. Mr Glass explained that he had built his house before the days of modern insulating materials such as expanded polystyrene, but the walls are packed with sawdust behind a hardboard lining to keep heat in. Glass panels in the roof are covered with an inner lining of clear plastic sheeting, and apart from a fluorescent tube mounted in

## PETFISH MONTHLY visits

# Mr T. W. C

the gable for use after daylight hours the lighting for the tanks is entirely from this source. In summer Mr Glass gives a coat of emulsion paint to the roof panels to decrease the light intensity (the paint is easily stripped from the glass in the autumn), but in answer to a question from me about algae he said that greening occurred only temporarily in newly set-up aquaria and that after establishment of a tank this trouble did not arise, despite the abundant natural light.

Stout wooden staging, painted black, on a firm linoleum-covered floor carries the tanks, the frames of many of which are painted red and showed no signs of rust. At first I thought this was because of the recent refurbishing to which they had all been treated, but Mr Glass told me he finds that polyurethane paints, if used when a tank is first obtained, give perfect protection to the metal. The whole appearance is most bright and pleasing.

It was a surprise to find that the heating for this fish house is by paraffin burners, for there was no smell of the oil to be noticed. Two heaters of greenhouse design are used, and an electric fan provides air circulation. Ventilators at each end of the house also form a controllable part of the heating and air-circulating system.

Box-type bottom filters are used by Mr Glass in all his tanks, with glass wool used as filter medium. For one of his largest tanks, at floor level, in which big cichlids including some lovely *Cichlasoma auratus* are kept, an Eheim filter is used. Air supply for the internal filters is given by a compact high-output aerator of German manufacture, set out of the way on a shelf overhead.

Mr Glass started in the hobby by keeping fancy goldfish about 14 years ago in an indoor aquarium, although this was only a new field within a general interest in animals he has had all his life. Since then fish have become his strongest interest, and he now has a long record of fish-keeping success. This success has won him showing awards, and he likes showing 'for the fellowship and chance to meet other aquarists', but he is not interested in acquiring 'pots'. His desire to experiment with the practical keeping of fishes and to make observations on their habits has meant that he has kept and keeps quite a wide range of types. He told me that he is unable to resist the unusual, and he has a collection of well-grown specimens to prove this.

If pressed to answer that he is a specialist Mr Glass names the toothcarps as the fish he has kept most. As



## ss at Home

an example of his success in developing and perfecting a strain of fish it can be said that his veiltail guppies became so prized that they were exported to enthusiasts in Switzerland and Sweden. He is of the opinion that a deterioration in quality of livebearers has taken place in recent years.

As well as the *Pelmatochromis* breeding, in other tanks at the time of my visit I saw pearl danios spawning, fighters with bubble nests ready for breeding and blue acaras (show prize-winners) with eggs on the floor of their tank.

Water plants, too, interest Mr Glass, and he grows several types in trays of loam placed in the aquaria. He gave me an interesting demonstration of the difference in growth of *Cabomba* in hard and very soft water: in the tank of soft water (distilled water had been used) the plants had grown but were becoming whitish at their tops, those in the hard water not showing this at all.

Mr Glass has a strong sense of humour, and I think he believes this to be a necessary quality for anyone engaging in the organised side of the hobby. Hearing him tell of past experiences such as staging a fish display on rain-soaked ground beneath a marquee revealed this.



One corner of the fish house. The white-framed tank at the bottom houses large cichlids

'First and foremost this is a hobby', he said, adding that he thought it detrimental to one's enjoyment of it if some aspects are taken too seriously.

Mr Glass is show secretary of Willesden A.S. and a member of B.A.S.S., and is a well-known figure at London inter-club shows, at which he arrives on his motor cycle with his fishes stowed neatly on the back.

Perfect fish-keeping he strives for, but this he obviously enjoys, and he is an aquarist who is for whole-hearted enjoyment of his hobby.

**Anthony Evans**

? ? ?

*Continued from page 173*

this floating plant may be encountered; the greater (*Utricularia vulgaris*) and the lesser bladderwort (*Utricularia minor*). Although both kinds will trap live foods that would be better used by the fry, it is doubtful if this would happen to a serious extent if adequate feeding is maintained. However, with the smallest egg-layer fry there is a possibility that the greater bladderwort at least could trap the tiny fish; again it is doubtful if this would cause really disastrous losses, but most breeders are jealous for every one of their precious brood! In summary therefore, the lesser bladderwort can be

used in tanks with the bigger types of egg-layer fry and in any tanks if the possible loss of a few fry does not worry you.

### Aquarium Polyps

*The glass of my tropical tank has suddenly become infested with a number of objects like tiny sea anemones. What are these and are they harmful?*

These creatures are almost certainly hydra, probably introduced into the tank with live foods and/or plants. They can move freely by means of their sucker foot; they catch their prey by means of the long tentacles seen when the polyps are in their extended form. When disturbed they can contract to a small round blob. They are not dangerous

to any but the smallest fry, and many of the gouramis, including the blue and leeri gourami, will eat them. So one method of eliminating them is to introduce a couple of these fish into the tank. If all the fish can be removed from the tank, however, the addition of one tablespoon of household ammonia for every five gallons of water should be sufficient to kill the hydra. Afterwards, of course, the tank must be taken down and washed very thoroughly before the re-introduction of the fish. Some fish-keepers have experimented with the use of wires in the tank connected to a low-voltage battery to kill hydra, and we would be interested to hear details from any reader who has had experience with this procedure.

## Transatlantic TOPICS

FISH-KEEPING is noted for controversial topics but despite this most aquarists seem to agree that newly hatched heine shrimp is a fine first food for most fish. This statement also holds true for the U.S.A. but the fact that they seemed to get better hatchings than we made me curious to find out why. After all we both use the same eggs. Everything checked with the exception that the American hobbyist adds lye to his hatching mix, so on my return I eagerly sought a supplier, only to find that obtaining lye in Britain was just about as easy as obtaining a Bank Loan. Not to worry, a chemist friend solved the problem by suggesting that ordinary washing soda would act as a substitute. For those interested here is the American formula for a successful hatching, measurements to English standards: 2 gallons of aged water; 12 table-spoonful of non-iodised salt; 3 table-spoonful of Epsom salts (magnesium sulphate); finally, a level teaspoonful of lye (substitute washing soda). Happy hatchings!

If you are in the market for something a little different for that A.O.V. Class and if your tastes run to catfish you need look no further than the blue catfish (*Ictalurus furcatus*); readily identified because of its forked caudal fin, this is the largest and most valuable of the North American cats. Though the average blue catfish reaches a weight of around 20 pounds, specimens have tipped the scales at 150! If that doesn't whet your appetite, the fact that it makes excellent eating should.

Fish clubs on both sides of the Atlantic boast their commercial members, but a glance through the pages of the July TROPICAL JOURNAL, club publication of the South Florida A.S., made me look again. It listed no less than 29 commercial club members; 24 of these operate pet stores in the Miami area alone. This must make this Florida holiday resort an aquarists' paradise.

Recent research work carried out by Dr Bernard W. Agranoff, Professor of Biology at the University of Michigan, has shown that goldfish can learn to swim over a hurdle and perform upon a light signal to avoid an electric shock. Dr Agranoff also found that the antibiotic polymyxin, if injected into them, tended to cause loss of memory of their training. Can we look forward to the day when exhibitors will simply press a switch to ensure that their entry receives full marks from the judge for condition and deportment, and if not simply drug their fish to obliterate the shame of losing? Shades of science fiction!

Claim for the largest public aquarium in the world must surely go to the John G. Shedd Aquarium in Chicago. First opened to the public in June, 1910, its 10,000 specimens representing about 250 distinct species of fishes, have seen some records broken in their 36 years of entertaining the public. Radiating from the rotunda are six main galleries, each 90 feet long and 30 feet wide, containing some 132 exhibition tanks. The largest tanks are 30 ft by 10 ft and the water in them over 6 ft deep. For those good at maths that means approximately 13,500 gallons of water! To illustrate the interest shown in this display one day alone saw 78,658 people pass through the turnstiles... that's just about the population of our City of Bath.

Cheerful news for those aquarists who have difficulty in remembering those scientific names of our fishes. A manufacturer of tape recording equipment in the U.S.A. has marketed a speaker which slides under your pillow and whispers those unpronounceable names in your ear whilst you sleep. They claim you can't fail to learn with this method. Collection of apparatus seems to be part and parcel of the fish-keeper's stock-in-trade these days; do we now have to add a tape recorder to our growing list of equipment in an effort to keep up with the Jones's?



By JIM KELLY

Just plum ugly are the only words I can find to describe a native fish from the tropical shores of the New World, the scorpion fish (*Scorpaena plumieri*). The head seems too large for the body and is often armed with long sharp spines; hanging around rocky shores, they are prolific on the Pacific Coast and once they have established a 'home' for themselves seldom stray far away from it. Makers of horror films need look no further for subjects than these 'out of this world' creatures.

'In knowing your guppies there is one puzzler that everyone must face sooner or later: what constitutes a good female as opposed to a poor one! To my knowledge there is no positive way of selecting female guppies for breeding purposes other than the general rule of good females are sisters to good males. If you have good appearing males in a litter, chances are that the girls will be good too. The only way is to breed with them all.' Those words of wisdom to followers of the fancy guppy fashion hail from George B. McCroskey, Toledo Area Guppy Group. Have readers anything to add?



**BREEDER'S NOTEBOOK**

# The Bleeding-Heart Tetra Obliges but—

By J. LEE

FIRST of all, when I planned to try breeding these fish, I was undecided what to do. What sort of tank and what size to use? At first, I was going to use an 18 in. by 12 in. by 12 in. all-glass tank, but after a lot of thought I decided on a standard sized (24 in. by 12 in. by 12 in.) tank I had been using for marines.

The ends, back and underneath had already been painted black. The tank was disinfected by being filled for about 1 hr. with a strong solution of potassium permanganate. It was then emptied and thoroughly rinsed out. When it was on its stand, I filled the tank up to 4 in. in depth with filtered rainwater to which I added a 1 in. layer of boiled peat moss. This was allowed to settle for a couple of days.

I then topped the tank up with another 2 in. of pure distilled water, which I had filtered through some peat moss in a fine nylon net until the water had a slightly amber tint and to which I had added 2 level teaspoons of rock sea salt. I placed a piece of hardboard on the top over the glass so that the light was subdued and let the tank stand for one week. By then, the temperature had stabilised at about 80°F (26°C) and the pH was slightly acid.

By this time the water and peat had settled and the tank was quite clear. The pair of bleeding-heart tetras (*Hyphessobrycon rubrostrigatus*) used for spawning had not reached full maturity. The female was the bigger of the two, robust with eggs and about 2½ in. long. The male was slightly smaller. Nevertheless they were in good colour and breeding condition. I placed the female in the tank on Friday evening to get her used to it and then selected a nice large clump of willow roots, which I scalded under a stream of boiling water from the kettle and thoroughly rinsed, opening a few large holes in it with my hands to allow both fish to swim through. After this, I checked over everything until I was satisfied

that I had forgotten nothing. The female seemed quite content, browsing in and out of the willow roots and I thought the time had come to try this difficult and lovely fish. On the Saturday I introduced the male very gently then sat on my stool and watched for an hour very quietly from a distance.

After I had waited quite a while, the fish began to swim side by side, the female trembling slightly now and again. As it was getting well into the evening, I decided to leave them to it and lock the fish house up for the night, but just before I came away I added half a teaspoon of Blackwater Tonic to the tank. The fish spawned early Sunday morning. It was a nice sunny morning, and I thought they were reaching the end of their chasing, but, as I watched, the female would rest awhile, off the centre of the tank near the bottom, and then the male would chase her vigorously through the thickets. They kept this up for about 1½ hr. and then, as everything seemed quiet, I removed both fish.

I could see no eggs at this stage, but with great excitement I started an egg hunt and eventually at the back and amongst the peat I saw quite a few eggs. They were clear. I could not detect many with the interior being on the dark side, but I did not dare to put a light over the tank in case it did any damage to the eggs. I then placed some brown paper down the front of the tank to shield the eggs from the sun and light. Hatching took place on the third day, and on the fourth the fry were free-swimming.

I then started to add Infusoria from a pond with a rich content of various sized animal life. From then on things ran quite smoothly. The fry were put on to brine shrimp and micro worms and eventually on to Grindal worms and sifted daphnia, on which they grew quite rapidly.

## Oh! — Those Discus!

I thought that I was going to be able to report something extra specially exciting a few weeks back, but disappointments for the breeder come as well as successes so let me tell you about this one. I have a lovely pair of brown discus fish (about 4 in. long) living in a

30 gallon tank. It has peat on the bottom and is filled with filtered rainwater and planted with large clumps of *Cryptocoryne*, a giant Amazon sword plant and a big banana plant. In the centre at the back is a nice piece of shapely Cornish stone and to the left of this a piece of

**Breeder's Notebook***Continued from page 183*

twisted bark from an oak tree about 100 years old.

To my surprise I found that the discus had spawned on the glass at the dark end of the tank. About 24 eggs were to be seen on the glass, and such was our excitement neither I nor my wife dared to venture into the fish house again that day. As evening approached, however, I crept in through the door on my hands and knees to avoid disturbing the fish and crawled to the front of their tank like a snake to peer in. Alas! the eggs had disappeared, and I've been a dejected aquarist ever since. Never mind, I shall keep trying, continuing to give them the diet of phantom larvae, *Tubifex*, *Daphnia*, white worms and prepared dog food they had been getting before the spawning. At the time of spawning the tank temperature was 84° F (29° C).

Breeding success comes all too seldom with the discus fish

Photo: B. PENGILLY



## Water Plants and Special Compost

By T. ROLAN

**A**LTHOUGH on the face of it the requirements of most water plants are extremely simple it is certainly true that a large number of aquarium owners are perpetually in a state of despair about their plants. There is, of course, no single answer to all the problems that arise and any general remarks on the subject of water plants must always be given with the reservation that individual types often have special needs that must be supplied.

One aspect that merits consideration is whether the provision of a special bottom medium, that is something other than 'aquarium gravel', offers any advantage for plant growing. On this topic divided opinions are heard, and there are good reasons for the divergence of views.

In an aquarium that has been set up for some time and which has always had fishes in it there is no doubt that good plant growth should be obtainable with gravel or sand alone present in the base. But in a newly set up tank, or a large aquarium with only a small fish population, the results with at least some plants will be quite different. It is significant that water plant specialists, commercial and otherwise, nearly always use some kind

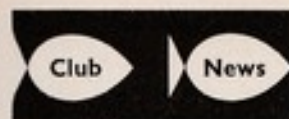
of 'compost' in their tanks. The inference here is that the well 'manured' tank best meets the needs of growing plants and that a prepared compost can also supply these needs by giving suitable conditions around the roots of the plants even if in itself it does not contain a 'manuring' agent.

### Planting in Containers

It is nothing new to suggest that a compost does not have to be spread all over the base, but surprisingly few people take advantage of the possibility of planting their greenery in small pots or trays of compost that can then be partly buried in the gravel or concealed behind stonework. In this way the needs of an individual plant variety can readily be met even in a tank that is already set up. The containers do not have to be elaborate and suitable ones can easily be made from cut-down

*Continued on page 192*





THE HORIZONS of members of AIREBOROUGH & D. A.S. stretch wide through the efforts of the secretary and editor of their monthly bulletin, Mr R. E. Hampson. Publication of letters from societies in America and Canada and an analysis of useful new ideas from abroad are a constant feature. In the latest issue, a letter from Mr W. L. Whitem of Canada outlining his efforts to set up an international aquarist organisation in North America (the T.I.F.A.S.) is linked with Mr Hampson's own call to the societies with whom bulletins are exchanged, such as York, Merseyside, Newport, Plymouth and Sheffield, to consider the formation of an International Federation. Interested readers might care to contact Mr Hampson at The Headlands, Scotland Lane, Horsforth, nr Leeds. Another suggestion is that, with the help of its members, Aireborough should build up programmes of colour slides that can be loaned out to other clubs at home or overseas.

Meantime the regular activities of the club go on, and at the recent annual Members Show at which over a dozen large cups are competed for, the results were as follows:

Livebearers: 1, Mr Whiteley (Oryzias latipes); 2, Mr Whiteley (Oryzias latipes); 3, Mr Beeland (Guppies); Barbs: 1, Mrs Helm (red-fin barb); 2, Mr Hampson (B. arabicus); 3, Mrs Dickinson (clown barb); Characins: 1, Mr Hampson (flax tetra); 2, Mr Hampson (bleeding heart); 3, Mr Lister (bleeding heart); Anabantids: 1, Master Kirby (opaline gourami); 2, Mr Hampson (Oreosoma); 3, Mr Iverson (Oreosoma); Cichlids: 1, Mr Walker (Aequididymus ornatum); 2, Mrs Helm (C. irroratus); 3, Mr Walker (P. arthron); Cats and loaches: 1, Mrs Helm (narrow cat); 2, Mr Lister (moated loach); 3, Mrs Dickinson (Clarias cat); A.o.v.: 1, Mrs Helm (tota); 2, Mrs Dickinson (red-tailed shark); A.v. pairs: 1, Mrs Helm (C. jubi); 2, Mrs Helm (R. schuberti); 3, Mr Iverson (tiger barb); A.v. juvenes: 1, Mr Joyce (japanese eel); Mr Joyce (moon platy); 3, Mr Whiteley (japanese eel); A.v. juvenes: 1, Miss Hampson (weather loach); 2, Master Kirby (red sword); 3, Master Kirby (red sword); Furnished aquaria: 1, Mr Myers; 2, Master Dickinson; 3, Master Atkinson. Best fish in show: Mrs Helm (tota).

SINCE their first annual general meeting at the beginning of this year REIGATE & REDHILL A.S. have forged steadily ahead. Table shows have been held at each of the

fortnightly meetings as well as lectures and discussions. Many members of the Society have attended shows during the summer with notable successes. At one of the meetings in July the ladies were in charge for the evening. Mrs S. Packman and Mrs P. Whittington gave a slide show with tape-recorded talk on the brine shrimp (by courtesy of Hendon A.S.). Also seen were slides of Mr and Mrs Whittington's garden with ponds and lilies and close-up shots of their fancy goldfish collection. Prospective new members should contact the secretary, Mrs S. Packman (107 Prince Albert Square, Earlswood, Redhill, Surrey).

ROWNTREE A.S. held a most successful annual open table show (their second) in July. The show attracted 295 exhibits and visitors attended from Aireborough, Bradford, Cresswell, Durham, Garforth, Hartlepool, Hatfield, Heywood, Huddersfield, Independent, Kippax, Leeds, Manchester, Mansfield, Peterlee, Pontefract, Salford, Snaith, Staithes, Stockport, Stockton-on-Tees, Sunderland, Swillington, Tadcaster, Thorne, Workop and York. An inscribed plaque and the A.Y.A.S. diploma plus the F.N.A.S. diploma were presented to Mr D. Carr (Bradford & D. A.S.) for the best fish in show, a flying fox which merited 87 points. Plaques and a F.N.A.S. diploma were won by Mr A. M. Deakin (Cresswell & D. A.S.) for a blind cave fish and Mr J. Heslop (Peterlee & D. A.S.) with a Nannacara. The T. & W. Adamson cup and plaque, breeders class, was presented to Mr H. Ashley (Cresswell & D. A.S.). In the society competition, the Lewis J. Falkingham memorial trophy and a specially inscribed plaque were presented to Cresswell, who won the competition with 55 points. Swillington were second with 37 points and Huddersfield third with 35 points. Full results were:

Swordtails: 1, Mr D. Clarke (Garforth); 2, Mr R. E. Hampson (Aireborough); 3, Mrs B. Cohen (Pontefract). Molliis: 1, Mr W. Payer (Hartlepool); 2, Mr W. Birning (Stockport); 3, Mr K. Snales (Swillington). Platys: 1, Mr G. Hammett (Huddersfield); 2, Mr J. Chamberlain (Stockton); 3, Mr P. Reynolds (Swillington). Guppies: 1, Mrs B. Cohen (Pontefract); 2, Mr J. R. White (Huddersfield); 3, Mr J. H. Heap (Salford). Barbs, small: 1, Mrs S. Barry (Swillington); 2, A. and F. Stanforth (Cresswell); 3, Mr K. Glover (Swillington). Barbs, large: 1, A. and F. Stanforth (Cresswell); 2, Mr W. Parkin (Huddersfield);

3, Mr I. G. Hunt (Sunderland). Characins, small: 1, Mrs S. Barry (Swillington); 2, Mr S. Collinge (T.A.R.); 3, Mr G. Sumner (York). Characins, large: 1, Mr A. M. Deakin (Cresswell); 2, Mrs E. M. Smith (Staithes); 3, Mr J. W. Bower (Mansfield). Minnows, danios and rasboras: 1, Mr D. Carr (Bradford); 2, A. and F. Stanforth (Cresswell); 3, Mr C. Holmes (Hatfield). Sharks and flying fox: 1, Mr D. Carr (Bradford); 2, Mr A. M. Deakin (Cresswell); 3, Mrs E. M. Smith (Staithes). Fighting fish: 1, Mr W. Cannell (Tadcaster); 2, A. and F. Stanforth (Cresswell); 3, Mr P. Reynolds (Swillington). Anabantids a.o.v.: 1, Mr S. Dakin (Cresswell); 2, Mr R. E. Hampson (Aireborough); 3, Mr L. Kaye (Huddersfield). Cichlids, dwarf: 1, Mr J. Heslop (Peterlee); 2, Mr L. Kaye (Huddersfield); 3, Mr J. Flintoff (Staithes). Cichlids, large: 1, Mr C. Holmes (Hatfield); 2, Mr I. G. Hunt (Sunderland); 3, Mr W. Parkin (Huddersfield). Catfish, small: 1, Mr A. Trotter (Staithes); 2, Mr and Mrs B. Wiggins (White Rose); 3, Mr K. Snales (Swillington). Catfish, large: 1, Mrs A. Wiggins (White Rose); 2, Mr and Mrs B. Wiggins (White Rose); 3, Mr J. C. S. Williams (Ovram). Loach and eels: 1, Mr I. G. Hunt (Sunderland); 2, Mr W. Parkin (Huddersfield); 3, Mr W. Parkin (Huddersfield). Toothcarps: 1, Mr W. Cannell (Tadcaster); 2, Mr P. Reynolds (Swillington); 3, Mr K. Snales (Swillington). Breeders livebearers: 1 and 2, Mr J. Williamson (Stockton-on-Tees); 3, Mr F. Clarke (Garforth). Breeders egg-layers: 1, Mr A. Ashley (Cresswell); 2, Mr D. Cohen (Pontefract); 3, Mr G. Hammett (Huddersfield). Pairs livebearers: 1, Mr R. Wolstencroft (Heywood); 2, Mr D. Cohen (Pontefract); 3, Mr B. Wiggins (White Rose). Pairs egg-layers: 1, Mr D. Carr (Bradford); 2, Mr W. Parkin (Huddersfield); 3, Mr R. Bean (Staithes). Tropical a.o.v.: 1, Mr R. Bean (Staithes); 2, Mr J. Heslop (Cresswell). Ladies tropical a.o.v.: 1, Miss A. Wiggins (White Rose); 2, Mrs B. Cohen (Pontefract); 3, Mrs A. Dearing (York). Juniors tropical a.o.v.: 1, Miss L. Hesley (Cresswell); 2, Miss L. Hampson (Aireborough); 3, Miss A. Wiggins (White Rose). Coldwater a.o.v.: 1, Mr A. Trotter (Staithes); 2, Mr P. Waller (White Rose); 3, Mr F. B. Hill (Thorne). Individual furnished aquaria: 1, Mr P. Reynolds (Swillington); 2, Mrs B. Cohen (Pontefract). The chairman of the A.Y.A.S., Mr D. Carr, presented the trophies and award cards.

CHANGE of name for the Midland Inter-Society League means that in future it will be known as the MIDLAND AQUARIST LEAGUE. This was one of the proposals accepted by those attending the annual general meeting held in June. The revised rules of the league state that five shows should be held per season, the venue being arranged by rota and each show providing two classes and one breeders class. It was agreed that the two classes required to cover the extra show should be catfish and loaches and rasboras, danios, killies and White Cloud minnows. The rota for the coming season (September to May) would be: September, Rugby—coldwater; a.o.v. tropical; breeders livebearers; October, Atherstone—abantids; cichlids; egg-layers; March, Northampton—catfish and loaches; rasboras, danios, killies, White Clouds; livebearers;

April, Leamington—barbs; characins; egglayers; May, Coventry—guppies; a.o.v. livebearer; live-bearers. Although Leamington's proposal, that there should be a furnished jar class at each league show the points for which should count towards the league, was defeated, it was agreed by all that the furnished jar class should be encouraged and it was hoped that societies would feature a jar class at league shows as a separate item.

THE 30-strong membership of the recently resuscitated **ABERDEEN A.S.** has been working hard to prepare a display of fishes for the opening of the Aberdeen Zoo. It was proposed to include some tanks of coldwater fishes native to the area, such as minnows, sticklebacks, perch, pike and trout.

AT the **DEAL & D. A.S.** annual general meeting the following officers were elected: chairman, Mr B. Lawrence; vice-chairman, Mr R. Boulter; secretary, Mr E. Hooper; treasurer, Mr Robinson; committee, Mrs R. Deacon and Mr R. Dykes. One of the first of the new Committee's tasks was to bring to a successful conclusion all the preparations for the annual show that took place in July, and the decision to hold a separate show rather than one in conjunction with other local societies was amply justified. Mr J. V. Morrice judged the fish, which were of a very high standard—in particular the *P. ardensis* entered by Mr A. Robinson. Results were: Furnished aquaria: Mr R. Dykes, Mr B. Lawrence and Mrs M. E. Baker, Mrs M. Deacon and Mr E. Hooper. Singles: Mr A. Robinson and Mr B. Lawrence, Mr E. Hooper and Mrs M. E. Baker. Pairs: Mr A. Robinson, Mr R. Dykes, Mr A. Robinson and Mrs M. Deacon. Highest aggregate: Mr B. Lawrence, Mr R. Dykes, Mrs M. E. Baker and Mrs M. Deacon.

**BASILDON & D. A.S.** recently held the second leg of the interclub table show meetings with Southend, Leigh & D. A.S. and Thurrock A. Club. Mr Creed (F.B.A.S.) gave a talk on the a.b.c. of fishkeeping and the judges were Mr Stewart (F.B.A.S.) and Mr Goodall (F.G.A.). Results were:

Guppies, males: 1, Mr D. Stockwell

(Basildon, 77 pts); 2, Mr J. Higgrave (Basildon, 75 pts); 3, Mr Dunn (Southend, 75 pts); 4, Mr J. Higgrave (Basildon, 74 pts). Guppies, females: 1, Mr J. Higgrave (Basildon, 75 pts); 2, Mr D. Smith (Basildon, 75 pts); 3, Mr B. Lupton (Basildon, 68 pts). A.o.v.: 1, Mr B. Lupton (Basildon, 82 pts); 2, Mr Dunn (Southend, 85 pts); 3, Mr D. Smith (Basildon, 85 pts); 4, Mr Niccoll (Thurrock, 84 pts). Danios, rainbow and minnows: 1, Mr B. Lupton (Basildon, 88 pts); 2, Mr Nicholls (Thurrock, 87 pts); 3, Mr D. Chatter (Southend, 85 pts); 4, Mr B. Lupton (Basildon, 85 pts). Labrynths: 1, Mr Niccoll (Thurrock, 85 pts); 2, Mr Mendle (Thurrock, 85 pts); 3, Mr Barber (Thurrock, 85 pts); 4, Mr Capon (Southend, 82 pts).

Meetings are held fortnightly on Monday evenings at 8.0 p.m. at the Laindon Community Centre, Aston Road, Laindon. New members will be warmly welcomed and can obtain further details from the secretary, Mr H. Furneaux at 12 Brempsons, Basildon, Essex.

THE 1966 Annual Table Show of **YEOVIL & D. A.S.** attracted a record number of 126 entries, including 14 home aquaria. Judges were Mr R. Matley and Mr W. Coombes of Poole and, for the home aquaria, Mr D. Silver. Results were:

Goldfish: 1, Mr W. Reeves; 2 and 3, Mr M. Enticott. Bristol shubunkins: 1, 2 and 3; Mr S. Langdon. London shubunkins: 1, Mr V. Collins. A.o.v. fancy coldwater: 1 and 2, Mr V. Collins; 3, Mr W. Reeves. A.o.v. pond or river: 1, Mr W. Reeves; 2, Mr V. Collins; 3, Mr W. Reeves. Breeders coldwater: 1, 2 and 3; Mr S. Langdon. Labrynths: 1, Mr N. Wright; 2, Mr J. Hulbert; 3, Mr D. Phinn. Scarfs: 1, Mr T. Sharp; 2, Mr G. Gillard; 3, Mr T. Sharp. Characins: 1 and 2, Mr T. Perry; 3, Mr N. Wright. Ciclids: 1 and 2, Mr D. Phinn; 3, Mr G. Gillard. A.o.v. tropical egglayers: 1, Mr D. Chaffer; 2, Mr G. Gillard; 3, Mr J. Hulbert. Catfish: 1, Mr D. Chaffer; 2, Mr D. Phinn; 3, Mr T. Perry. Molluscs: 1 and 2, Mr C. Bushell; 3, Mr A. Nicholls. Male guppies: 1, 2 and 3, Mr G. Gillard. Female guppies: 1, Mr T. Sharp; 2, Mr G. Gillard. Swords and plants: 1 and 2, Mr J. Hulbert; 3, Mrs C. Bushell. Breeders

egglayers: 1, Mr T. Perry; 2, Mr G. Gillard; 3, Mr D. Phinn. Breeders livebearers: 1, Mr G. Gillard; 2, Mr C. Bushell; 3, Mr D. Chaffer. Home aquaria: 1, Mr M. Enticott; 2 and 3, Mr D. Phinn. Rogers shield for the best coldwater entry: Mr W. Reeves. Enticott challenge cup for most points in the coldwater section: Mr S. Langdon. Swainer shield for the best tropical entry: Mr T. Perry. Bryant cup for the best livebearer: Mr C. Bushell and Mr J. Hulbert (draw). Small cup for most points in show: Mr G. Gillard.

IF the efforts of members of **NOTTINGHAM & D. A.S.** are now being directed largely towards their National Open Show at the beginning of this month (3rd and 4th September), the N.A.D.A.S. flag has been kept flying throughout the summer at a good number of other clubs' shows. Mr Cyril Hill put the society well to the fore by winning the first, second and third prizes in the coldwater class at the Mansfield & D. A.S. show and again the following week at the Creswell A.S. show. At Mansfield, Mr K. Riley was awarded a first and second with a *P. ardensis* and a leeri gourami, Mrs I. Bulleymont a second with a red-tailed black shark and Mr G. Bulleymont a second with a *Pachy panchax playfavi*. At Creswell, Mrs I. Bulleymont won a first with a red-tailed black shark, Mr G. Bulleymont a first and third with a panchax and a characins and Mr K. Riley a third with cherry barbs in the breeders class. At the end of June, the inter-club show with Nottingham Tropical Fishkeepers resulted in a win for the N.A.D.A.S. This evening proved once again a very pleasant social event with not only a table show and refreshments but a cinema show in

## British Marine Fish Surveys

THE MARINE STUDY AQUATIC SOCIETY has recently published in their Bulletin the results of surveys on the five-bearded rockling and the dwarf sea horse. The secretary of the society reports that in its first 6 months ten full surveys have been issued, completed and filed for further reference. The latest survey, requiring information on fish caught on the shores of Britain, is issued in conjunction with the Department of Zoology of the British Museum (Natural History). Information is sought from both members and non-members and those who would like to participate should contact the

hon. secretary at 2 Gatcombe Road, London, N.19.

The Society also announced that there are now sufficient members to form a London regional branch, which will be under the secretaryship of Mr A. S. Metzger (112 Brook Drive, London, S.E.11). The London section intends to hold regular meetings, at which discussions will take place on marine topics and marine fishes displayed. All enquiries with regard to membership will be welcomed. It is intended that further regional branches will be formed as membership in any one locality increases.



which past shows were screened. The results of the club's own pond competition have now been given. Mr M. Morley was awarded first place with 68 points for a very well designed pond over 6 ft. deep in the centre. One of the judges describes the surround of staggered rocks, the waterfall passing under the shade of willows and the edging of stoncrop and other rockery plants as showing a good deal of artistic talent. Occupants of the pond include roach, tench, rudd, full-grown golden orfe 18-24 in. and a hybrid bream-orfe. Other prize-winners were: 2, Mr C. Hill (63 pts); 3, Mr A. Adcock (51 pts); 4, Mr C. Hill (54 pts); 5, Mr N. Goodlife (46 pts).

AT the last meeting of the EASTERN COUNTIES Section of THE FEDERATION OF GUPPY BREEDER'S SOCIETIES Mr Thomas was presented with a replica of the club cup that he had won for three consecutive years with his bottom sword guppies. He was also awarded a gold pin for his gold female in the grey and gold female class. Meetings of this group are held at 36 North Street, Plaistow on the third Tuesday of each month and prospective new members should contact the secretary, Mr L. Randall (118 Brook Street, Erith, Kent) for further details.

THE following societies have appointed new secretaries: LEAMINGTON & D. A.S., Mrs S. D. Underwood, 22 Westlea Road, Leamington Spa; CHELSEA A.S., Mr E. J. Arthur, 4 Richard Knight House, Faversham Road, Fulham, London, S.W.6; STOCKPORT A.C., Mr C. Fernley, 59 Didsbury Road, Noeris Bank, Stockport, Cheshire (this address is for correspondence only—callers should contact 13 Claremont Road, Woodsmoor, Stockport). In the July issue of PETFISH MONTHLY, Mr N. V. Lee press secretary of UNBRIDGE & D. A.S., was referred to as the secretary. This should have read: Mr C. Bull, 70 Hatherleigh Road, Ruimsip, Middlesex.

THE LLANTWIT MAJOR A.S. annual show in June drew 240 entries. Mr Lloyd of Cardiff A.S. was presented with the D. & J. Amis challenge cup for the best furnished aquaria, and the following plaques were awarded: Mr K. Farrant (best egg-layer); Mr B. Light (best cold-

water fish); Mr R. Wigg (best live-bearer, best breeders egg-layers, best breeders livebearers, E. & S. Stear challenge cup for best guppy. Other results were:

A.v. fighters: 1, Mr P. Barnata; 2, Mr S. Nelson; 3, Mr A. Ibbertson. Labyrinth: 1 and 2, Mr A. Ibbertson; 3, Mr C. Gornwall; 4, Mr D. Songhurst. *Hemigrammus* and *Hyphessobrycon*: 1, Mr E. Clark; 2, Mr R. D. Johns and son; 3, Mr J. Saunders and Mr R. Taylor. A.v.v. characin: 1, 2, 3 and 4; Mr K. Farrant. Barbs: 1, 3 and 4; Mr R. Wigg; 2, Mr M. Burgess. Guppy male short tail: 1, Mr C. W. Smith. Guppy male long tail: 1 and 2, Mr R. Wigg; 3, Mr S. Steer; 4, Mr H. Counsell. Guppy female: 1 and 2, Mr R. Wigg; 3, Mr P. Barnata. Platys: 1, Mr R. Wigg; 2, Mr P. Barnata; 3, Mr M. Burgess; 4, Mr K. Farrant. Swordtails: 1, Mr D. Songhurst; 2, Mr A. Davies; 3, Mr S. Nelson. Mollies:

Llantwit Major, Glam); show secretary, Mr D. Songhurst; librarian, Mrs Evans. The monthly meetings, at which new members are always welcome, are held on the second Tuesday of each month at 7.30 p.m. in the Lesser Hall. The meeting on the 8th October, however, will take the form of the tenth annual dinner, which is to be held in the Cross Keys Hotel.

RECENT activities of the UNBRIDGE & D. A.S. have included a trip to Hayling Island, when two coach loads of members and friends went to view Fernwood Aquarium



At the Leamington & D. A.S. Show 270 fish entries were benched and a good attendance from distant clubs was reported

1, Mr P. Barnata; 2, Mr S. Nelson. Catfish: 1, Mr B. Light; 2, Mr A. Ibbertson. Corydoras: 1, Mr P. Harris; 2, Mr T. Phipps. Dwarf cichlid: 1, Mr C. Gornwall; 2, Mr A. Jones. Cichlid: 1 and 4, Mr C. Gornwall; 2, Mr W. Ward; 3, Mr B. Light. Danio, rasbora: 1, Mr E. Clark; 2, Mr M. Burgess; 3, Mr A. Ibbertson. Egg-layer tooth carp: 1, Mr W. Ward; 2, Mr W. Evans; 3, Mr P. Barnata. A.v. coldwater: 1, 2, 3 and 4; Mr B. Light. A.v.v. tropical fish: 1, Mr A. Ibbertson. Breeders guppies: 1, 2 and 3, Mr R. Wigg. Breeders egg-layers: 1, Mr R. Wigg; 2, Mr S. Nelson; 3, Mr M. Burgess; 4, Mr P. Barnata. Juvenile: 1 and 4, P. Fernbertson; 2 and 3, T. Phipps. Furnished aquaria: 1, Mr G. Lloyd; 2, Mr S. Nelson; 3, Mr W. Songhurst.

At the society's 13th annual general meeting the following officers were elected: chairman, Mr K. Farrant; secretary and treasurer, Mr R. Wigg (17 Ham Lane South,

and Nurseries. In spite of the weather, the party greatly enjoyed the visit and many members made useful purchases. At an inter-club show with Willesden A.S., Unbridge were beaten by 24 points to 16 but intend to turn the tables at the return match. A competition has also been arranged with Amersham.

The home table show held at the end of July was well supported and the judge, Mr Towell, was called upon to judge 38 fish and six plants. Results were:

Plants: 1, Mr Forder (*Echinodorus radiatus*); 2, Mr Peters (*Calanthe*). Novice class: 1, Mr Thompson (sherry barb); 2, Mr R. Funnell (red platy); 3, Mr Nightingale (black mollie). Danio, rasbora and

White Clouds: 1, Mr Perry (giant danio); 2, Mr Stapleton (*Rasbora heteroflora*). Guppies: 1, Mr Summers (Mollie); 2, Mr Williams; 3, Mr Hickman. Catfish and loaches: (this class attracted a large number of entries of good standard) 1, Mr Branton (C. palustris); 2, Mr Summers (C. jelski); 3, Mr Branton (C. asotus).

AFTER a lapse of four years **SOUTHAMPTON & D. A.S.** revived their open show and drew an entry of over 200 fish. The diploma for the best tropical fish in the show was won by Mr Zurmuehle (Hillingdon) and that for the best coldwater fish by Mrs Voysey (Basingstoke). The Southampton Society cup for the most coldwater points was won by Mr H. Gilbert and the tropical points cup by Mr Jones. Other results were:

Female guppies: 1, Mr G. Greenhall (Morden); 2, Mr Gillard (Yeovil); 3, Mr A. Coombs (Salisbury); 4, Mr D. Jones (Southampton). Male guppies: 1, Mr Wright (Yeovil); 2, Mr R. Keeping (Basingstoke); 3, Miss Parker (Southampton); 4, Miss Parker (Southampton). A.V. characins: 1, Mr C. Bailey (Southampton); 2, Mr P. Morgan (Gosport); 3, Mr C. Bailey (Southampton); 4, Mr L. Hastings (Southampton). Livebearers: 1, Mr Scott Morgan (Bournemouth); 2, Mr G. Greenhall (Morden); 3, Mr B. Randle (Bagshot); 4, Mr D. Jones (Southampton). Plaits: 1, Mr Scott Morgan (Bournemouth); 2, Mr R. Keeping (Basingstoke); 3, Mr B. Randle (Bagshot); 4, Mr R. Keeping (Basingstoke). Barbs: 1, Mr Gillard (Yeovil); 2, Mr P. Morgan (Gosport); 3, Mr V. Fish (Southampton); 4, Mr E. Kemp (London). Minnows, danios and rudders: 1, Mr V. Voysey (Basingstoke); 2, Mr R. Keeping (Basingstoke); 3, Mr G. Greenhall (Morden); 4, Mr J. Erry (Basingstoke). Fishers: 1, Mr J. Stillwell (Portsmouth); 2, Mr B. Poole (Bournemouth); 3, Mr B. Brown (Salisbury); 4, Mr Scott Morgan (Bournemouth). A.O.V. labrids: 1, Mr Gillard (Yeovil); 2, Mr B. Poole (Bournemouth); 3, Mr Zurmuehle (Hillingdon); 4, Mr B. Randle (Bagshot). A.V. cichlid: 1, Mr Zurmuehle (Hillingdon); 2, Mr I. Andrews (Bournemouth); 3, Mr Scott Morgan (Bournemouth); 4, Mr Gillard (Yeovil). Catfish and loach: 1, Mr Armitage (Havant); 2, Mr Bailey (Southampton); 3, Mr B. Poole (Bournemouth); 4, Mr Zurmuehle (Hillingdon). A.O.V. tropical: 1, Mr V. Voysey (Basingstoke); 2, Mr V. Fish (Southampton); 3, Mr T. Erry (Basingstoke); 4, Mr I. Andrews (Bournemouth). Breeders egg-layers: 1, Mr I. Andrews (Bournemouth); 2, Mr B. Randle (Bagshot); 3, Mr Gillard (Yeovil); 4, Mr R. Keeping (Basingstoke). Breeders livebearers: 1, Mr R. Keeping (Basingstoke); 2, Mr D. Jones (Southampton); 3, Mr Scott Morgan (Bournemouth); 4, Mr Scott Morgan (Bournemouth). Common goldfish and shubunkins: 1, Mrs Voysey (Basingstoke); 2, Mrs Gilbert (Southampton); 3, Mr V. Voysey (Basingstoke); 4, Mr W. Ryder (Portsmouth). A.O.V. fancy goldfish: 1, Mr J. Stillwell (Portsmouth); 2, 3 and 4, Mr H. Gilbert (Southampton). A.O.V. coldwater: 1, Mr J. Stillwell (Portsmouth); 2, Mr V. Voysey (Basingstoke); 3, Mr Barcham (Poole); 4, Mr Hunt (Portsmouth). Furnished aquaria coldwater: 1, Mr V. Fish (Southampton); 2, Mr H. Gilbert (Southampton). Furnished aquaria tropical: 1, Mrs Gilbert (Southampton); 2, Mrs Jones (Southampton).

**THE RADLETT** Section of the **FANCY GUPPY ASSOCIATION** hold their monthly meetings at the

## Borough of Harringey Show

AN open show of coldwater fishes, sponsored by the Borough of Harringey, was held in conjunction with this London Borough's annual fête on 30th and 31st July. Under the watchful supervision of Mr R. Elsdon, the aquatic show manager and other members of **TOTTENHAM A.S.** who had volunteered their services, the show was a great success, in spite of heavy rain throughout. Notable among the native coldwater entries were a large golden perch in excellent condition and several entries of native marine fishes. The show was judged by Mr A. Boarder. An added attraction was a table show of fishes from the Essex and N.E. London area group, composed of Walthamstow, Chingford, Bethnal Green and Tottenham A.S. The pairs class in this section attracted quite a large entry. The display by the Marine Study Aquatic Society aroused a great deal of interest as did tanks containing *Meryemii* and tinfoil barbs. In fact, although the weather left a great deal to be desired with a show under canvas, there was a constant stream of visitors admiring the exhibits. After the show Mr Elsdon stated that, if everything went according to plan, the Tottenham Open Show of tropical fish will be held later in the year, probably in October. Results of the open competitive coldwater show were:

Coldwater furnished aquaria: 1, Walthamstow & D. A.S.; 2, Tottenham A.S.; 3, Tottenham A.S. Common goldfish: 1, Mr H. Berger (84 pts); 2, Mrs P. Whittington (80 pts); 3, Mr H. Berger (79 pts). Shubunkins: 1 and 2, Miss D. Morris (88 and 82 pts); 3, Mr R. Whittington (79 pts). A.O.V. singletail: 1, Mr R. Elsdon

(82 pts); 2, Mr W. Leach (79 pts); 3, Miss R. Berger (71 pts). Fantails: 1, Mr J. Linsle (84 pts); 2, Mr H. Berger (83 pts); 3, Mr H. Tisbury (79 pts). Veiltails: 1, Mr L. F. Clements (78 pts); 2, Mr H. Berger (75 pts); 3, Mr H. Tisbury (70 pts). Moon: 1 and 2, Mr H. Tisbury (87 and 85 pts); 3, Miss D. Morris (82 pts). A.O.V. rostrated: 1, Mr H. Tisbury (80 pts); 2, Mr J. Linsle (bubble eye, 79 pts); 3, Mr H. Tisbury (pearlescent, 77 pts). A.O.V. coldwater: 1, Mr H. Berger (golden perch, 84 pts); 2, Mr R. Nutt (barb, 81 pts); 3, Mr D. Nutt (tench, 82 pts). Breeders rostrated: 1, Miss D. Morris (85 pts); 2, Mr J. Linsle (81 pts); 3, Mr J. Linsle (75 pts). Breeders singletails: 1, Miss D. Morris (brilliant shubunkin, 71 pts); 2, Mrs P. Whittington (67 pts). Best fish in show was a shubunkin owned by Miss D. Morris.

Results of the table show competition for tropicals between the Essex and North and East London area group (Walthamstow, Bethnal Green, Chingford and Tottenham) were:

Livebearer pairs: 1, Mr T. Needham (Walthamstow, swordtails, 70 pts); 2, Mr W. Wren (Bethnal Green, green sword, 78 pts); 3, Mr W. Wren (Bethnal Green, veiltail guppies, 77 pts). Egg-layer pairs: 1, Mr W. Wren (Bethnal Green, moonlight gouramis, 80 pts); 2, Mr S. G. Mooney (Tottenham, cherry barbs, 79 pts); 3, Mr R. Hobson (Walthamstow, *Copeina guttata*, 78 pts). Egg-layer breeders (fishes in this section were awarded over 14 points for difficulty of breeding): 1, Mr A. Collins (Bethnal Green, *Jurupia florida*, 81 pts); 2, Mr D. Nutt (Tottenham, opaline, 83 pts); 3, Mr A. Collins (Bethnal Green, salween, 82 pts). Breeders guppies: 1, Mr W. Wren (Bethnal Green, 81 pts); 2, Mr and Mrs I. Nutt (Tottenham, 74 pts); 3, Mr and Mrs I. Nutt (Tottenham, 73 pts). Breeders sword: 1 and 2, Mr D. Nutt (Tottenham, reds, 73 and 72 pts). Breeders mollies: 1 and 2, Mr S. G. Mooney (Tottenham, liberties, 81 and 79 pts); 3, Mr T. Needham (Walthamstow, 55 pts). Breeders plaits: 1, Mr R. Elsdon (Tottenham, reds, 79 pts); 2, Miss M. Hines (Tottenham, reds, 78 pts); 3, Mr D. Nutt (Tottenham, marigold, 75 pts). Inter-club results: 1, Tottenham (28 pts); 2, Bethnal Green (13 pts); 3, Walthamstow (6 pts).

Guide Hut in Radlett on the second Sunday in each month. At each meeting there are lectures and talks on how to breed really good guppies and a table show which members support enthusiastically. At the June meeting, for instance, 11 members between them exhibited 69 fishes. All who wish to know more about it should contact the section secretary, Mr George Goodall, 3 Turner Avenue, Tottenham, London, N.15 (phone LAT 1846 after

5.0 p.m.) or attend a meeting, where they will be assured of a very friendly welcome.

**GOSPORT & D. A.S.** are looking forward to the battle at the next inter-club show. Says their secretary, Mr R. Betts, 28 Barnbrook Road, Salisbury Green, Hants.: 'Of the twelve clubs that participated at the inter-club show at Portsmouth, we came twelfth. (Someone has to, but we are re-



solved to do better next time!]. Meantime, club members have been greatly entertained by a slide show and talk given by Mr Ryder of Portsmouth, the interest of which was heightened by the inclusion of many colourful foreign stamps depicting fish. Results of the table show at this meeting were: 1, Mr Stevens (female red swordtail); 2, Master Perman (yellow tail rasbora); 3, Mr Clough (male red fighter); 4, Master Clague (male blue fighter).

THE annual event of the year for **YORK & D. A.S.** took the form of an inter-society competition at which York emerged victorious. Judges were Mr J. M. Skinner and Mr R. M. Faircliff and placings were:

Livebearers: 1, Mr P. Clarke (Garforth); 2, Mr J. Whiteley (Aireborough); 3, Mrs M. Winfield (Garforth). Barb: 1, Mrs J. Hilda (York); 2, Mr A. E. Whitlock (Tadcaster); 3, Mr G. E. Walker (Aireborough). Characins: 1, Mr B. Robson (York); 2, Mr F. Carey (York); 3, Mr T. Adamson (Rozzano). Anabantids: 1, Mrs M. Winfield (Garforth); 2, Mr M. H. Cooper (York); 3, Mr P. Kirby (Aireborough). Cichlids: 1, Mr Mackrill (Goole); 2 and 3, Mr G. E. Walker (Aireborough). Cypris and minnows: 1, Mr Mackrill (Goole); 2, Mr G. B. Howlsby (York); 3, Mrs J. Hilda (York). Fighters: 1, Mr W. Cattell (Tadcaster); 2, Mr R. Lancaster (Aireborough); 3, Mr L. Greenall (Tadcaster). Catfish and loaches: 1, Mrs C. Bingham (York); 2, Mr M. L. Smith (York); 3, Mr R. Loner (Aireborough). Toothpaste: 1, 2 and 3, Mr W. Cattell (Tadcaster). Breeders livebearers: 1, Mr P. Clarke (Garforth); 2 and 3, Mr A. E. Whitlock (Tadcaster). Breeders cyprids: 1, Mr W. Cattell (Tadcaster); 2, Mrs R. Rumbold

(Tadcaster); 3, Mr Mackrill (Goole). A.O.V.: 1, Mr G. B. Howlsby (York); 2, Mr Mackrill (Goole); 3, Mr G. Sutton (York). Coldwater: 1, Mr M. H. Cooper (York); 2, Mrs H. Simons (York); 3, Mr Ploes (York). Furnished show (art): 1 and 2, Mr F. S. Harris (York); 3, Mr M. H. Cooper (York). Plaque for best fish in show: Mr W. Cattell (Tadcaster, *Aphysosoma australe*).

**RUGBY & D. A.S.** picked a strong team, composed of Mr Bramley, Mr and Mrs Pearson, Mr and Mrs Fox and Mr Deacon, with quiz master Mr Bennett, to answer the challenge of the taped quiz sent by the New Plymouth Aquarium and Water Garden Society of New Zealand. At other club meetings, lectures have been given by Mr D. Lucas of Leamington on tropical fish and by Mr W. Devison, secretary of the British Killifish Association on some of the many varieties of these fishes. The breeding technique was also shown and discussed. At the first of these meetings, the table show featured the fish of the month, cichlids. There was a very good entry, judged by Mr F. Pearson, and results were: 1, Mrs J. Smith (blue acara, 63 pts); 2, Miss V. Slatcher (blue acara, 60½ pts); 3, Miss V. Slatcher (jewel cichlid, 60 pts); 4, Mr D. Bramley (*Aptostegannus ramirezi*, 59 pts). The second table show of the month featured a.o.v. tropical and livebearers pairs and livebearers breeders class. Show-

pairs of fish seems to be very popular with Rugby members and there were 27 entries. Positions were:

A.O.V. tropical pairs: 1, Mr R. Deacon (*Hyposternon littoralis*, 84 pts); 2, Mr R. Deacon (*Gynostichus niger*, 83 pts); 3, Mr and Mrs Pearson (*Stiphodon nigrofasciatus*, 82 pts); 4, Mr and Mrs Pearson (*Aplocheilichthys lineata*, 81 pts). Livebearers pairs: 1, Mr W. Edden (*Mollisoma trifida*, 83 pts); 2, Mr B. Woolberton (*Lemna nigrofasciata*, 78 pts); 3, Mr R. Fox (*Xiphophorus maculatus*, 75 pts); 4, Mr D. Bramley (*Xiphophorus helleri*, 74 pts). Livebearers breeders: 1, Mrs O. Fox (*Xiphophorus maculatus*, 74 pts); 2, Miss B. Mellor (*Lebistes reticulatus*, 72 pts); 3, Mrs O. Fox (*Xiphophorus helleri*, 71 pts); 4, Mrs O. Fox (*Lebistes reticulatus*, 70 pts).

## Goldfish Society A.G.M.

AT the annual general meeting of **THE GOLDFISH SOCIETY OF GREAT BRITAIN** it was reported that a feature of the year had been the increase in overseas membership. The secretary reported also a pleasing number of new members and a trend for overseas societies to approach the G.S.G.B. for advice on judging and staging shows. The following officers were elected: chairman, Mr G. H. O'Neill; secretary, Mr L. W. Wilson; treasurer, Mr Walters; lay member, Mr Palfry; auditors, Capt. L. C. Betts and Mr Sumbler.

## Dates for your Diary

3rd September. **HIGH WYCOMBE & D. A.S.** Open Show at the Rye, High Wycombe, Bucks. Schedules from show secretary Mrs V. Pike, 16 Ashley Drive, Tylers Green, Penn, Bucks.

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 SOCI-**

**TIES** at The Good Templar Hall, Gray Street, Broughty Ferry, Angus. Host Club: **DUNDEE A.S.**

4th September. **MIDDLESBROUGH & D. A.S.** Open Show at Berwick Hills Community Centre, Middlesbrough. Further details from Mr N. Brant, The Bungalow, Staithes, Saltburn-by-Sea.

11th September. **FANCY GUPPY ASSOCIATION (RADLETT Section)** Annual Show at the Guides Hut, Radlett, Herts. Benching 12.0 noon-2.30 p.m. There will be an open class for non-members.

11th September. **RUGBY & D. A.S.** Show. Further details from the

secretary, Mr R. Deacon, 19 New Street, Rugby.

11th September. **HUDDERSFIELD TROPICAL FISH SOCIETY** Open Show at the Friendly and Trade Societies Club, Northumberland Street, Huddersfield. Further details from Mr L. Kaye, 6 Totties, Holmfirth, Huddersfield.

17th September. **NEWPORT A.S.** Fourth Annual Open Show at the Stow Hill Secondary School, Newport. Classes (26) include two for marine fish. Show secretary: Mr M. J. Parry, 45 Western Drive, Gabalfa, Cardiff.

18th September. **GARFORTH & D. A.S.** Open Show at Church Hall, Church Lane, Garforth, Leeds. Benching 1.00-2.30 p.m. Further details from Mr R. A. Clarke, 66 Derwent Avenue, Garforth, Leeds.

## Dates for Your Diary

18th September. **STOCKPORT A.C.** First Open Show at the British Railway Social Club, Edgeley Road, Stockport, Cheshire. Schedules from Mr C. Fernley, 59 Didsbury Road, Norris Bank, Stockport.

23rd and 24th September. **BRISTOL A.S.** Annual Open Show, including marine classes with special trophy, Bishopston Parish Hall, Benching on 22nd September. Full details and programmes from Mr M. S. Bellis, 2 Fairfield Place, Southville, Bristol 3.

24th September. **KINGSTON & D. A.S.** Annual Open Show. (Further details awaited; secretary, Miss P. Greenhalf, 39 Garth Close, Morden, Surrey).

24th September. **CAMBRIDGE & D. A.S.** Second Annual Show, Tracy Hall, Cockburn Street, Mill

Road, Cambridge. 4.00 to 7.00 p.m. Free, all welcome. Further details from Mr G. P. Rivett, 19 Goding Way, Milton, Cambridge.

25th September. **BLACKPOOL & FYLDE A.S.** Open Show at the Harrowside Solarium, South Promenade, Blackpool. Further details from Mr C. A. Jones, 4 Halts Lane, Poulton Le Fylde, Lancs.

2nd October. **HEYWOOD & D. A.S.** Open Table Show. Details awaited.

2nd October. **BRADFORD & D. A.S.** Open Table Show at The Whist Room, Textile Hall, Westgate, Bradford. (Details awaited).

8th October. **THE GOLDFISH SOCIETY OF GREAT BRITAIN** Convention at the Chelsea Community Centre, King's Road, Chelsea, London. Further details from the secretary, Mr W. L. Wilson, 57 Constable Gardens, Edgware, Middlesex.

15th October. **EAST LONDON AQUARISTS & PONDKEEPERS ASSOCIATION** Annual Show,

Ripple Road School, Barking, Essex. Details available from show secretary Mrs P. Harris, 86 Leigh Road, East Ham, London, E.6.

16th October. **STONE A.S.** Second Open Table Show. Further details from show secretary Mr K. J. Harvey, 61 St. Vincent Road, Walton, Stone, Staffs.

20th-22nd October. 30th Annual Open Show of the **SCOTTISH AQUARIUM SOCIETY**, McLellan Galleries, Sauchiehall Street, Glasgow, C.2. Thursday and Friday 2.00-9.00 p.m.; Saturday 10.00 a.m.-9.00 p.m. All details from Mr John Miller, 14 Alloway Avenue, Kilmarnock. Also on the 21st and 22nd the **FANCY GUPPY ASSOCIATION (SCOTTISH SECTION)** are staging an Open Guppy Show. Entry forms and details from Mr A. Wallace, Canal Road, Johnstone, Renfrewshire.

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

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Continued on page 184

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The soil or loam should be first spread out in a thin layer on a flat surface and inspected carefully, any conspicuous lumps of vegetable matter or any animal life being then picked out. If the soil can be placed in a hot oven for an hour, or steam-sterilised, this can be done as a further precautionary measure to exclude fungi, bacteria and protozoans (not very likely to be harmful ones in the aquarium, however).

Peat moss should be crushed and dispersed with the fingers and well mixed with the soil, about one measure of the peat to two measures of the soil giving suitable proportions. Into this mixture is next worked slightly less than one measure of aquarium gravel. The prepared compost is then placed in the container to be used and sufficient water added to wet it. After the plant has been set in position in the container of moistened compost a layer of washed aquarium gravel can be added to the top and the whole is then ready for placing in the aquarium. By lowering such a container and plant slowly through the water it can even be included in a tank that is already set up.

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