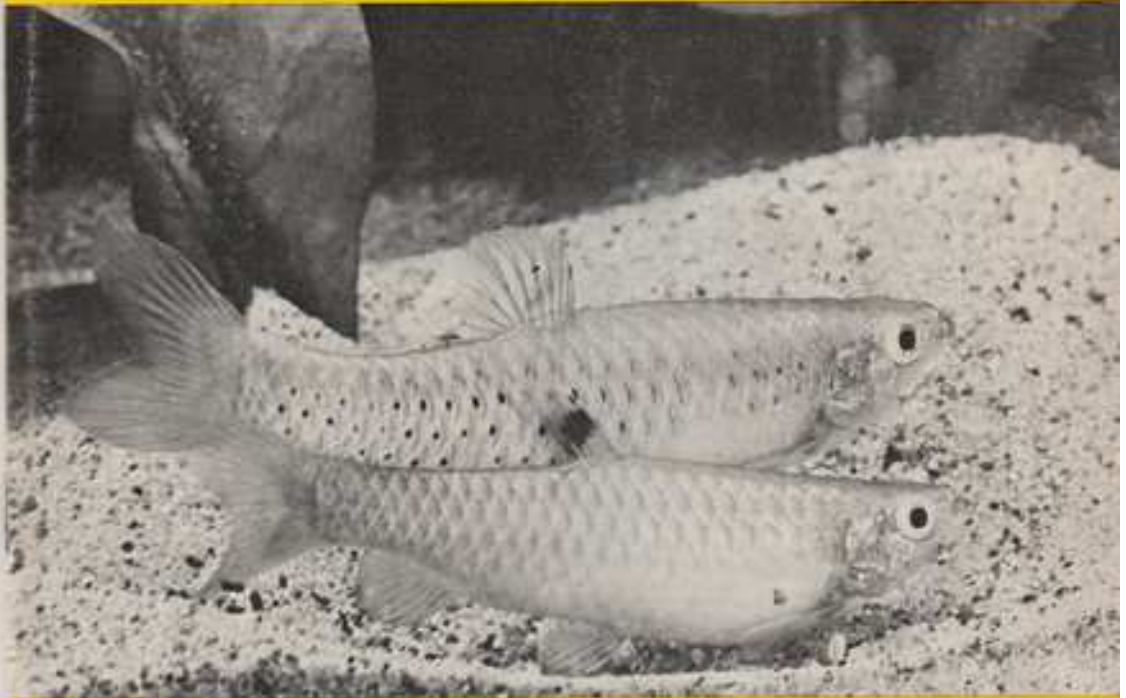


APRIL 1974

20p

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**PetFish Monthly 20p**

Vol. 8 No. 12

April 1974

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**In This Issue**

	Page
Comments and Quotes	577
Letters	578
All-Glass Aquarium	588
Mozambique Mouth-breeders	589
The Ocellated Feather-back	590
What's New?	592
Personal Comment	593
Spawning of the Arulius Barb	594
How to Culture Grindal Worms	596
Dealing with the Algae	598
Marinist's Notebook	600
A Spawning of the Red-Spotted Copepods	601
Reader's Queries Answered	604
Dealing with Early Spawnings	605
Catfish for the Specialist	607
Bacopa	608
AquaGlossary no. 10	610
Club News	610
In Brief	611
Meetings and Changes of Officers	613
Dates for Your Diary	614

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**Comments and Quotes****Sea Weed Pest**

MORE news of the sea algal pest *Sargassum muticum*. This sea weed from Japan, which has already caused serious clogging and interference with fisheries in American Pacific coastal waters, appeared around British shores just over a year ago. We reported last July the valiant efforts of scientists from Portsmouth Polytechnic who had commenced collecting operations in attempts to wipe out the pest. Unfortunately their work has not yet succeeded in this object and now an appeal has been made by the Marine Resources Laboratory of Portsmouth Polytechnic, based on Hayling Island, for volunteers to start the work again as summer approaches. What is worrying the scientists is the likely effect of this year's heavy storms of spreading the fronds of the weed, which float free in the sea, and of course the plant's spores. Aquarists who are able to reach the Portsmouth area who wish to offer their help in collecting and destroying the alga should contact the Marine Resources Laboratory, Portsmouth Polytechnic, Hayling Island, Hants.

**Pets and Zoonosis**

ZOONOSIS is the diseases passed on to humans from animals, and unfortunately the animals may be man's dogs and cats or other pets. A pamphlet recently issued by The Health Education Council warns parents about these dangers and gives the elementary rules of hygiene to be observed to limit the risk of infections from pets. 'Exotic

creatures, particularly monkeys and birds of the parrot family, should not be kept in any 'bonsai' says the pamphlet. Fortunately exotic fishes do not appear to be vectors of human disease, but the warning should be passed on that tortoises and terrapins can be sources of salmonellosis (food poisoning) if hands, human food or domestic surroundings become soiled with their excreta. Scrupulous cleanliness all round is obviously the best rule to observe in the keeping of all pets, for health of both owner and pet.

**Too True!**

'THERE are over half a million guppy breeders in this country, and there is not one with the same markings and coloration as another' (from an essay on 'Variation' written by a 12 year-old boy, quoted in THE MOTOCUIT). He could be right!

**Production of PFM**

CURRENT national working difficulties have seriously disturbed the production schedule for 1974 and created delays in our distribution. A decrease in size of issues has been unavoidable and we hope that our readers will bear with us in the circumstances, particularly readers overseas who are without firsthand knowledge of problems in the U.K. To minimise delays in printing we have been forced to suspend the usual provision of proofs of advertisements and in this too we have to ask for the indulgence of advertisers. Like everyone else, we are hopeful that these difficulties will soon be surmounted.

Next month's issue of PFM will contain an author and subject index to volume 8 completed with this number



PETFISH  
MONTHLY

# LETTERS

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

### Auxiliary Power

I HAVE just received the January issue of PFM and have read the article 'Fishkeeping Without Power' by Roy Pinks. I commend him for a fine article on a very serious subject and I'm glad to see that PFM is doing everything it can to help during this 'difficulty'.

Here in the U.S. we have only had threatened power cuts and I was recently pleased to learn that our local generating stations are fired by coal, which is still in plentiful supply here, rather than oil which is causing everyone a lot of difficulty. In any event the purpose of this letter is to offer a suggestion that might, if you feel it is practical, be passed on to PFM's readers.

I own a commercial tropical fish farm here in Florida. Last summer when we first moved here I learned first-hand that central Florida is located in what is called 'the lightning belt'. Apparently there is more summer lightning here than in any other part of the country. As well as providing a bit of excitement to summer afternoons, the lightning causes frequent power failures, sometimes two failures per week. This happens here without any help from coal miners whatsoever!

I keep both marines and freshwater as well as some holding tanks which at times are overcrowded. Needless to say, my air supply is vital to me. I have come across a little gadget called a power inverter. This device is connected to an automobile storage battery and converts the 12 volt DC current to 110 volt AC. I then plug in several large vibrator air pumps which provide me with all the air that is needed for the emergency. The length of time the storage battery will operate this system is dependent on many variables such as the size and condition of the battery, the capacity of the power inverter and the size and number of the vibrator pumps. This system of emergency is not practical for heating or rotary motor compressors since both of these items use enormous amounts of power when compared to the very efficient vibrator pumps. During the last power failure I used four Menaframe Hosh III pumps and, had the blackout lasted that long, I believe my little inverter would have produced power for about 8 hours. Much larger inverters are available.

I do not know if inverters are available in England; I would assume so. I also do not know if

you use 110-120 volts AC on your vibrator pumps, but if you have inverters available I would assume they would be made to your requirements. The inverter I purchased was obtained from Lafayette Radio and Electronics, a large mail order electronics supplier. The cost, if my conversion is correct, was approximately £14 (\$37.00 U.S.). To me this was well worth the price. I suppose this is worth the price to any aquarist who has a valuable tank of marines.

Maywood Hatcheries, A. DOUGLAS WERBECK  
Rushin, Florida, U.S.A.

*Roy Pinks writes:* The power dislocation of two winters ago caused me to retrieve from storage a device I bought in a moment of apparent madness many years ago. It was claimed by the vendor to enable me to use my electric razor whilst actually sitting in my car! Though it was scarcely ever used for this purpose I did experiment with it briefly when our power cuts first began but I put it to one side when it became clear that it could only be used on electrical equipment designed for 110 volt operation. The thing is called an Electrolux Corporation Dynamotor, model 23350, and if I had some 110 volt vibrator pumps I should be home and dry, as I bought a heavy-duty battery for the hedge trimmer last year, and this would have worked splendidly.

I am sure that many fishkeepers over here, particularly professionals, will be most interested in following up your proposals, and I shall renew my efforts to obtain some suitably rated pumps—perhaps any supplier reading this correspondence would provide details of any equipment currently available in this country. The Dynamotor was, I believe, an item which often cropped up in Government Disposals shops, and there may be more tucked away in attics and workshops than may be imagined.

*Rotary converters that would perform this type of job used to be available at 'war-surplus' retailers here but a quick check around did not reveal a source at the present time.—EDITOR.*

Continued on page 587

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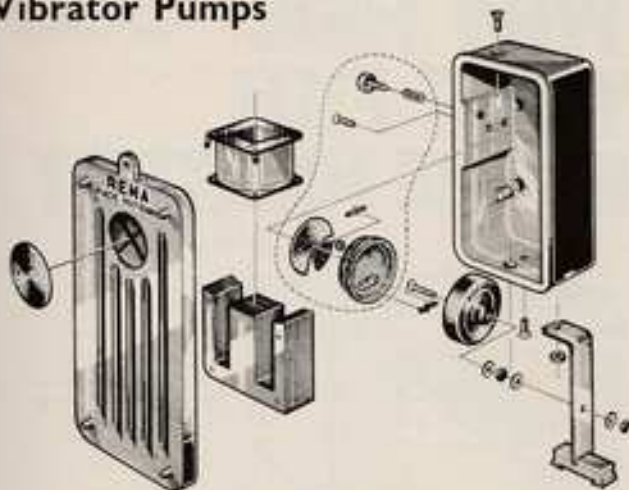
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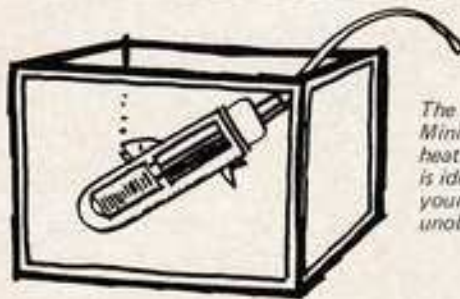
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# LETTERS

continued from page 578

## Coldwater Fish Classes

I FEEL that I must express my complete disgust with the standard of judging of the coldwater classes of many of last year's open shows. It is just a matter of time before many societies omit the coldwater classes from their schedule completely, due to the ever-increasing number of complaints arising from the exhibitors. Most of these complaints are often because of the judge's sheer ignorance towards coldwater fish in general.

For instance, at one Midlands open show last August, the judges actually admitted that they were not intellectually capable of judging a coldwater class of fish, and yet by some inconceivable method they managed to judge three separate classes. I suppose they felt that the coldwater classes didn't really matter anyway. Just who are these judges trying to con? Is it the different societies who often pay their expenses to come and judge the fish fairly at their shows, or is it the exhibitors themselves?

Stoke-on-Trent, Staffs.

M. CLARKE

## Aggressive Firemouths

UNLIKE the firemouths mentioned in the article on that species by R. Zukal (FFM, February 1974), four jewel and two firemouth cichlids in my 36 in. by 15 in. by 12 in. tank have attacked and battered my gourami, angels and swordtails, ate my neons and one small jewel cichlid. I removed the battered fishes, leaving only the cichlids, a catfish, loach and red-tailed black shark, and, believe it or not, two beacon tetras. The cichlids don't even look at the tetras. Has anybody else experienced this?

St Helens, Lancs.

M. HALLSALL

## Koi in Canada

ALLOW me to introduce myself. My name is Ken Richards and I am the president and founder of the Canadian Koi and Goldfish Keepers' Society. I've been a koi-keeper for about

4 years now and a goldfish owner for 21 years. After my koi spawned last June, I decided that it was time that Canada had an organisation devoted solely to koi and goldfish-keepers, hence the formation of the Canadian Koi and Goldfish Keepers' Society.

Founded in January 1974, the CKGKS was established (1) to educate the general public and other fish hobbyists to the existence of Japanese Imperial coloured carp (koi) and fancy goldfish, (2) to strive to achieve the breeding and raising of a constant high quality and standard of koi and goldfish, (3) to develop new and fancier varieties of koi and goldfish and (4) to maintain high standards in the hobby of koi- and goldfish-keeping world-wide. The Society holds regular club meetings, open to all members. Society newsletters are published on a regular basis and sent to all members, who are also invited to exhibit their fish at various shows throughout the year held by the CKGKS and other aquarium societies.

Membership in the Canadian Koi and Goldfish Keepers' Society is open to all who are interested in owning and keeping nishiki koi and fancy goldfish whether or not they are currently fishkeepers. Please address enquiries to me at the address below.

6 Gooderham Drive,  
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Canada, M1R 3G5

MR KEN RICHARDS  
Canadian Koi and Goldfish  
Keepers' Society

## Signs of the Times

OUR tropical fish club (namely Ely & District Aquarist Society) were thinking of holding an Open Show last year, but as there are so many shows we thought about something different, as we in Ely feel we have something to offer to the public and want to encourage more juniors to take up the hobby of tropical fishkeeping. So! We are holding a Home Aquarium Exhibition later on in the year, with many exhibits of fish, plants and accessories, free advice given, traders' stalls and something for the children. There will be more details given shortly.

MRS L. PORTER  
Secretary, Ely & DAS

DUE to the ever-increasing number of open shows, Brighton & Southern Aquarists' Society did not hold a show last year. This year the Society feel that they have found the answer. We have planned a 'Fish Keeping Exhibition' for 9th June. This is to incorporate an exhibition hall of manufacturers, local dealers and specialist societies, whilst in another hall we will have an Open Show to be judged by FBAS qualified

judges. This year we have a trophy for every class, including best individual exhibitor and best society exhibition.

We are hoping that as we are 5 minutes from the sea societies will make 9th June their family outing day, and to help them with their finances we are prepared to reduce entrance fees for block book-

ings. There will also be reducing fees for entering more than a certain number of fish.

Thank you for a splendid magazine.

MRS SALLY CORBIN  
Secretary, Brighton & Southern AS

Details are given in 'Dates for Your Diary'.

## All-Glass Aquarium Featured on December's Cover



Photo:

W. A. TOMEY

AS a number of readers have requested further details of the construction of the home aquarium featured on the front cover of last December's issue of PFM, Mr W. A. Tomey has supplied the following information.

Basically the aquarium is of all-glass construction and measures approximately 5 ft. by 18 in. by 18 in. Its front is surrounded by a frame of a

dark-hued decorative hardwood, the inner edges of which are covered with white rigid plastic edging. The lighting cover is also white and includes four fluorescent tubes, each of 40 watts (4 ft.). A small compartment to the right of the tanks (behind the small statue) houses an Eheim pump. The tank stands on a wooden bench faced with a board having pieces of natural stone, silver-grey in colour, glued to it.

**THE FANCY GUPPY ASSOCIATION** International Open Shows will once again take place at the Glebe Farm Community Centre, Glebe Farm Road, Stratford, Birmingham, on Saturday-Sunday, 25th/26th May, 1974. This Show of Shows attracts entries from America, Singapore and other countries but is still open to any number of the general public who has

an interest in the breeding and showing of guppies. Anyone who wishes to take part should send for details (enclosing s.a.e.) to the Association Show Secretary, Mr D. E. Beacham, 17 Pedmore Close, Woodrow South, Redditch, Worcs., as soon as possible. The special class to decide the FGA World Guppy Champion 1974 will take place and if an entry

form for this class is required this should be stated when writing to the show secretary (notification of the number of entries for this class is required at least 1 month before the Show in order to ascertain the number of tanks that will be required). The Show will be open for viewing to the public (non-participating) on Sunday, 26th May 1974.

## Mozambique Mouthbreeders

By EDWARD VIELMAS

THIS mouthbreeder (*Tilapia mossambica*) is one of the many cichlids of this habit from Africa. I first kept these fish about 6 years ago, when I received six 1-inch juveniles from the aquarium at the San Antonio (Texas, U.S.A.) Zoo. Over the next few months I was able to watch the fry grow to maturity and, indeed, even able to raise several spawnings from the one pair I eventually got. As a cichlid buff, I was euphoric to receive another species of African cichlids.

I introduced the small grey (almost colourless) fish into a 50 gallon community aquarium, also containing other juvenile cichlids. After the usual rivalry from introduction of new fish to an aquarium, the *Tilapia* and their tankmates settled down. The *Tilapia* quickly adjusted to their new home. They were often quarrelsome, but never pugnacious. The fish were left undisturbed for several months, until they matured. They were then 4 inches (10 cm.).

Several of the fish had changed in coloration. The females are still basically grey with a yellowish cast; dark-grey spots occur on their sides. The males underwent a dramatic colour phase—which intensified during spawning. The male's colour is now indigo—almost black. The tail and dorsal fins are edged in crimson. The pectoral fins are also red. The lower portion of the body and lower gill plates are white. The lips are thick and black. It was easy to see that I had three males and one female. I isolated a pair in a 20 gallon aquarium with rockwork arranged to provide cave-like dwellings.

A large area of the aquarium was left undecorated to provide sufficient area for breeding. Only a few large plants were rooted behind the rocks, where the fish would (hopefully) not venture. Because of the extra movements and shifting of gravel the plants were placed where they could not be uprooted or damaged. The water was kept at 78 F (26 C); one third was changed weekly, or at most fortnightly. Late one afternoon the fish spawned.

The pair's first spawning was not in the conventional manner. Most mouthbreeders, and cichlids, make a depression in the gravel and the female deposits a few eggs, after which the male will fertilise them. The female *Tilapia mossambica*, unlike most mouthbreeders (I later learned),

incubates the eggs. For some reason unknown to me, my pair did not make the usual depression in the gravel; instead they laid and fertilised the eggs on one of the rocks. Both fish scooped up eggs. The female ate her share about 4 days later and was removed. The male, surprisingly, cared for the fry.

After about a week and a half the fry could be seen through the male's nearly closed mouth. The fry were fed newly hatched brine shrimp. I would have to step back from the tank before the male would permit the fry out. They were fed twice a day.

On the twentieth day the male terminated his care and refused to allow the fry back in his mouth. At this point he was netted out and was heavily fed, as I had offered no food to either the female or male. (However, on several other occasions I—out of curiosity mostly—offered food to the female with no success.) After another week, the fry were given other types of foods. They were offered, and like their parents engulfed, frozen brine shrimp, ox heart, ox liver and a limited amount of flake foods. The fry soon acquired the same greyish-brown coloration that their parents had at the time I received them.

The pair spawned again two more times in the following months. However, they never again spawned in the manner of their first spawning. The second and third spawnings were all executed normally—the female incubated the eggs, and spawned in the depression in the gravel. The other spawnings all occurred in the same tank, with the same gravel, rocks and plants. At the time of the pair's third spawning, they had grown to 6 inches in length.

I decided to dispose of the adult fish and keep half a dozen of the fry from the third spawning. I raised the fry up to about 3 inches, when a malfunctioning heater killed the *mossambica* as well as all the other fish in the tank.

Even with the discovery and availability of the 'new' African cichlids, I am still fond of *Tilapia mossambica*. The fish have an excellent personality and can be easily trained to eat out of one's hand. Although my *mossambica* reach only a length of 6 inches, the Zoo's fish measured over 15 inches, which may discourage many hobbyists! Even so, I enjoy them.

## The Ocellated Featherback — a Graceful Knife Fish



*Notopterus chitala* (Hamilton, 1822)

By BRAZ WALKER

Photograph by the author

ONE of the most spectacular and breathtaking of freshwater fishes imaginable is the ocellated featherback, *Notopterus chitala*, which is sometimes sold under the name 'clown knife fish'. With a body form similar to its more familiar African relative, *Xenophysus nigri*, this fish has a long, gracefully rippling anal fin that is confluent with the caudal or tail fin and is the chief propulsive device. The body colour ranges from silvery gold to golden copper, and just above the anal fin in maturing specimens is a row of ocelli or eye-spots which would almost arouse envy in a peacock. Larger specimens of this Indo-Malasian fish develop a gibbous nape, or become rather hump-backed, and this as well as other *Notopterus* species have their backs equipped with a little dorsal fin which seems much too small and resembles a single, small feather adorning the upper surface of the fish. It is from this little fin that the generic

name, *Notopterus* (*noto*—back, *pterus*—fin) is derived.

Aside from its grace and beauty, this is a striking fish because of its size. Although it is often imported in small sizes, if well fed the fish grows rapidly and only those aquarists fortunate to have large aquaria are capable of satisfactorily maintaining this fish over a period of years. As permanent quarters for one or two ocellated featherbacks a minimum suggested tank size would be 30 inches in length. A larger aquarium is much better, allowing the fish a bit of room 'stretch', and this is a consideration when one realises that the fish will eventually exceed a foot in length. In large aquaria they at times may even exceed 2 feet, and in public aquaria where they can be housed in several hundred gallons of water they can become 30 inches or more. Obviously, this is not a practical size for the average fishkeeper



unless he or she has a swimming pool built into the house! In Nature they assume even larger proportions, of as much as 4 feet.

The long, rippling anal fin gives the featherback the ability to swim not only rapidly when the need arises, but in either direction simply by reversing the direction of the ripples. Turns are achieved for the most part by bending the rather tall, laterally compressed body although the pectorals are also incorporated to lend more precision to these and other manoeuvres.

The ocellated featherback and other members of the family *Notopteridae* are nocturnal by nature and prefer to spend daylight hours in seclusion under stumps, roots or in caves and away from the brightness. As soon as the lights are out, the fish become immediately active and the search for food begins. Although featherbacks can usually be trained to feed with the lights on, newly acquired fish are best fed in semi-darkness, at least until they become accustomed to their surroundings.

During the British occupation of India *Notopterus chitala* played a part in bringing a bit of light into the lives of a particular breed of Englishman who suddenly found himself serving his country in a land where the waters were mostly warm and the fish were mostly carps. To a true son of Isaac Walton, to be relegated to a land devoid of the trout and salmon he so dearly loved was to be sentenced to a private sort of purgatory which only another true angler could understand. Nevertheless, some were staunch enough in their devotion to the art and took their angling equipment with them to purgatory, and before long they had discovered that although there were no salmonoids to be found there were instead such things as 6 and 8-foot minnows, which would take a hook, as well as numerous fishes of every size and description which would rise to the fly or take the spoon. Washed down with a gin and tonic, the new situation was not as bad as it seemed.

*Notopterus chitala*, or the Seetal or Sectal, was one of those found not only to be a good game fish but was found to be among the better food fishes. It weighed up to 40 pounds, although the thick part of the back was considered too bony by Europeans; Hamilton said "The belly is uncommonly rich and well flavoured . . ." and a Mr Welborne, an angler, said "the natives think highly of it; and I think they are right, for I know nothing better in the fish line than the thin or belly part of this fish fried . . ." The same Mr Welborne also spoke of the gamefish qualities of the Seetal or *N. chitala* ("Seetal" or "Sectal" are probably forms of the native name for the fish, *chitala*, from which the trivial name was taken):

"This fish you will take with the live bait . . . but he has the habit, directly he is struck, of

running right under your boat, and you wind up, and wind up, thinking you have lost your fish, until you are agreeably astonished with a 'whir', 'whir', of your winch, and a glimpse of his bright silvery side as he goes off with his grand rush. Take him all in all, he is a gallant fish, and fights bravely."

Despite its generally good qualities as a food fish, in India there are certain prejudices said to be held against eating the ocellated featherback since it is reputed to feed on human carcasses. For this same reason Hindus regard catfishes as unclean since many of them are not above scavenging the dead.

In Thailand its value as a food fish is undisputed and it has been the object of culture programmes in that country for many years. Already abundant in the rivers, swamps and canals of Central Thailand, where large numbers are harvested with seines and by other methods to be shipped live downstream to market in rice barges, the Bureau of Fisheries has had stakes and posts driven into the bottom of swamp areas where spawning normally takes place, and these are used by the fish as spawning receptacles since they closely resemble the stumps and similar objects which are their normal egg depositories.

A single female can produce several thousand eggs at one spawning and as many as 10,000 in a season. The male assumes guard duty, fiercely attacking all intruders including humans. He drives away the countless small fishes which would dine on his caviar, and he patiently fans and aerates his unborn progeny to keep the eggs clean and oxygenated. Females have been found to contain eggs in several stages of development at a given time, although within a season only one ovary develops. The ripe ovary is found to occupy one side of the body cavity, the other internal organs being pushed to the other side. There are no oviducts and the eggs simply drop into the body cavity before being expelled. Because of its size, if for no other reason, breeding of this magnificent creature in an aquarium is unlikely although importation is becoming more frequent.

The family *Notopteridae*, which comprises *Notopterus* and *Xenomyzus* (which differs mainly from the other genus in lacking a dorsal fin, shares the order *Osteoglossiformes* or 'bony-tongues' with such unusual fishes as Africa's butterfly fish, *Pantodon*, the arowana, *Osteoglossum*, of South America and North America's *Hiodon*. A number of bony-tongued fishes live in swampy areas, which are subject to periodic differences in water level. This can lead to fishes being stranded in large numbers in small holes of water which may already be polluted and semi-stagnant. Many 'bony-tongues', including *Notopterus*, are capable of breathing atmospheric air and surviving while

other fishes around them perish. Even under more favourable circumstances the notopterids make periodic excursions to the surface for air, and in Central Thailand the ocellated featherback is one of the best-known fishes because of its habit of making a splash and rolling over as it surfaces, exposing its broad, silvery side.

*Notopterus chitala* feeds in Nature on insects, crustaceans, worms and fishes, especially small surface swimmers including halfbeaks and archer fish. In the aquarium, however, it learns soon to accept ground ox heart and pieces of fish or shrimp as well as live foods such as earthworms, which can be easily raised. Feeding, especially of newly acquired fish, is preferably done at night although after an initial training period featherfins may lose their shyness and come out to feed with the lights on.

Notopterids have very interesting and unusual eyes, designed to be of maximum efficiency under the low-light conditions which occur at the times when they are normally most active and seeking food. The retina of most vertebrate eyes, which is the light-sensitive part, contains two kinds of photoreceptors or light-receiving elements: rods and cones. Cones are less light-sensitive and are useful in bright situations whereas rods are much more sensitive and respond better to dim lighting. Most vertebrate eyes are equipped with rods and cones both about equally, although some, according to their living habits, have proportionately more of one or the other. Certain crepuscular (twilight-loving) and nocturnal fishes have little use for cones and have very few, as with notopterids, or in some cases none at all. The number of rods, however, is tremendously increased to capture every available ray of light. A few fishes such as the notopterids and the upside-down catfishes of Africa (Mochokidae) even have the inner surface of the eyeball coated with a mirror-like surface, which allows light to be even further collected and concentrated on the light-sensitive rods. Many aquarists have noticed in an aquarium in which the lights are out, that the eyes of some

fishes, especially catfishes, seem almost to glow in the dark, if a light is present elsewhere in the room. What is being seen is light reflecting from the mirror surface on the inside of the fish's eye.

Since the pupils of most bony fishes will not contract to reduce the amount of light entering the eye, another method of protecting from over-illumination has been developed. There is a pigment layer present in the back of the retina, and when there is sufficient light the pigment concentrates so the rods are 'shaded' by the pigment cells and only the cones are employed. Sudden bright lighting, however, catches the tremendously abundant rods of fishes completely exposed and unprotected. Not only is this painful to the creature, it involves a substantial physical shock. (It is this sort of shock which often causes nocturnal animals suddenly 'blinded' by headlights to dash directly into the path of the oncoming vehicle). Obviously, a shock of this sort is not beneficial to aquarium fishes, especially retiring types, and whenever possible the aquarist should give warning before suddenly flooding a dark aquarium with light.

For the fishkeeper who enjoys the spectacular, there are few freshwater fishes which can approach the ocellated featherback. Its colour, although striking, is a tasteful utilisation of simple colours black, silver and copper, artistically contrasted. Its form is unusual and its graceful actions are slow and deliberate, with a dignity found only in a few fishes such as discus. Even in Thailand its grace is appreciated, where it is known as 'pla kraai', meaning 'fish which moves slowly but naturally'.

Water quality for this fish is not critical as long as extremes are avoided, and a temperature of about 75-80°F (24-26°C) keeps the fish comfortable. Well-aged roots, stumps and appropriately sized caves should be provided, especially if more than one featherback is present. A few floating plants will help soften lighting and will be appreciated. For a large fish *Notopterus chitala* is not difficult to keep, and few have more to offer.

## What's New?

A CABINET stand, tailor-made to fit the tank (Gem and Jewel) and the requirements of both the fishkeeper and the decor of the sitting room, will always find a welcome place in the modern home. **Hamiltons** (1A Park Avenue, Barking, Essex) aquarium cabinets fit all these requirements. Constructed in a true wood teak veneer board with sturdy backing board to increase rigidity (and with the larger cabinets reinforced with a central strut from base to top) the cabinet consists of a display cupboard with glass sliding

doors (ground-in fingerpulls) and a lower storage cupboard with matching veneer-faced sliding doors. The storage cupboard will hide unsightly pieces of equipment and fish food containers and with the display cabinet constitutes an attractive piece of furniture. For extra protection the cabinets are sprayed in a clear lacquer finish. The size range covers the popular tank sizes, but cabinets required outside the range can be ordered. Quotations and prices are available on application to the manufacturers.



by  
ARPEE

## Personal COMMENT

ONE gets prejudices about certain fish from time to time, and as with other irrational things, they are difficult to shake off. Beacon fish (*Hemigrammus ocellifer*) stayed near the bottom of my shopping list for many years on the basis that some I kept a long time ago were exceedingly snappy with both other species and with their own kind, scarcely a recommendation for community life. Just as I was about to invest in a few more of them as a further trial I noted that McNerny and Gerard in ALL ABOUT TROPICAL FISH ascribed to them a proneness to white spot far more marked than is usual with small tetras. It is not altogether surprising that I resisted the urge to carry out what might have proved to be a costly and foolish experiment in a community which was re-establishing itself after several quite serious outbreaks of white spot.

Only quite recently, therefore, did I get round to considering this species again. I was impressed with a tankful I saw at a local dealer's, and as the fish were smallish specimens they were ideal subjects for quarantining in my small isolation tank. I disregarded the advice of the authorities above to the extent that I did not add methylene blue to the water. The fish behaved perfectly during their 14 days spell in this restricted space and there was no evidence of bickering. When the beacons were transferred to the community tank they seemed to settle down without incident. Their food requirements have never been noted as critical, and these fish responded consistently to finely crumbled flake food and whiteworm.

Their decorative value centres around their brilliantly glowing eyes and a similar golden-reddish spot on the upper part of the body just before the base of the tail. When viewed from a distance, and assuming even lighting, it is quite impossible to determine which way the fish are facing. Although often described as some form of defence mechanism, this is most unlikely, and it is now believed to act as a means of communication. True or false, there is no doubt that this characteristic has put the beacon in the forefront of the world of tetras in terms of popularity,

though some care needs to be taken to control tank lighting in order to make the most of this subject.

It is often recommended that beacons should be kept in a brightly lit aquarium, and it is true that a tankful looks really sparkling under these conditions. Nevertheless, something more subtle will prove more effective in bringing out the best in this fish. It may be possible to pinpoint your lights on to certain areas of the tank, or to arrange for surface cover to create shady areas. As the beacon moves from one of these areas to the other the golden spots will come and go like so many glowworms or fireflies, and if the room lights are low or extinguished the impression will be even more evocative of distant and mysterious parts.

A similar fish is *Hemigrammus pulcher*, the wedge tetra, and as they are compatible species the two could be used together in a tank created for visual appeal. They both grow to similar sizes, though the wedge tetra is a much chubbier and deeper fish altogether. The breeder will, however, prefer the beacon as an all-rounder because it spawns far more readily and the fry are not difficult to raise to maturity. Neither of these fish strikes me as particularly long-lived—perhaps 3 years is about the average expectation. Don't expect your dealer to be able to sex these fishes. Even if he could it is quite unreasonable to assume that such a selection would be of much help for breeding purposes. It is far better from every point of view to let a small shoal loose in your tank and see how things turn out, as likely pairs will soon emerge, and if they spawn under community conditions, which is highly likely, they can be separated out for more serious business if their owner so wishes.

My own fish have behaved so impeccably (and there's no sign of any white spot yet!), that I hope they will ultimately prove themselves to be one of the indispensables of my collection. On present form I have wrongly condemned them for far too long.



Whatever the outcome of our present economic troubles, we can be quite sure that the damage already done will mean harder times. Perhaps even the despised half penny will need to be looked at twice before we part with it; certainly, waste of any sort will justify ruthless elimination. Perhaps this is not a bad thing, even though the cultivation of meanness in normal times is something in which we take little pride.

If you take a look around your fish house or collection of aquaria, there will almost inevitably be evidence of waste of one sort or another. Some comes from bad planning, some from bad habits,

and some from lack of knowledge. Whatever the cause, it will prove interesting, if nothing more, to turn a critical eye on the situation, as I did recently. The first obvious thing was that I had some aquarium space badly allocated, and it was quite clear that I could save both money and electricity by closing down the heating on one tank and transferring the fish elsewhere. This in no way implied that I was cutting back on my total effort, but simply eliminating temporary waste. I now have a tank for either coldwater use or for some untried heated project after the power situation eases. Naturally, it will be wise to defer the establishment of new aquaria which require heat until the future prospects clarify somewhat, but the odd reserve tank you can create will, it may be realised, act as a buffer against basic supplies like heaters and thermostats becoming temporarily short. In other words, try to run your affairs with enough reserve to cope with domestic crises like burn-outs or cracked tank glass.

I expect we have all considered whether we can reduce the lighting over our tanks, but if not, this may prove very worthwhile, not simply because we might economise slightly in power consumption, but also on account of the fact that many fishkeepers over-light their tanks anyway. There are formulae for optimum lighting conditions, but the best evidence is that of your own eyes. If you think you could do with a little less, see whether in fact you might get by with a lot less. In particular, many people are still using filament lighting, which is notoriously expensive in terms of both maintenance and current consumption. It will be worth examining the pros and cons of adopting fluorescent lighting, especially for larger installations.

A look at the floor of several of my tanks conveyed the fact that there was a lot of mulm about, suggesting that perhaps I was overfeeding. Now I doubt that I am guilty of this, but it could

well be that I am feeding more than I need to. Considering the steady rise in the price of many packeted foods, try halving the amount you feed your fishes and see what effect this has. One very bad habit many aquarists adopt is that of feeding fish more than once a day. I have never found this to be necessary, excepting the case of rearing youngsters, where rapid intake of nutrients is vital to normal development. With adult fishes, which lead comparatively slothful lives in the peace of tanks, a lower intake than that dictated by natural conditions may be found perfectly adequate. A number of writers on marines, in particular, make this error, and although there may be certain marines which need more frequent feeding than once a day, I have yet to come across them.

My scrutiny also indicated that I had been more than generous when calculating how much air line and wire I really needed, and little imagination is needed to realise what a hazard loops of either can be if they obtrude themselves into the wrong places. It will therefore pay off to recover surpluses of both of these, which, if of reasonable length, can be used for odd jobs in the future. I renewed several of my air stones during this exercise, as it was quite obvious that those in use were inefficient, having become blocked by debris suspended in the water, and by algal growth.

Renovation of old airstones is not always as easy as it sounds. Some people just dry them off and find that they then work better. Others boil them, and still others rub them on an old file to remove the surface layer. Whatever your favourite remedy may be, have two or three new ones in reserve, as they are brittle things and sometimes disintegrate when being serviced.

I shall continue to cast a mean eye around my establishment—the foregoing suggests how to set about a critical review. If readers can suggest ways of becoming meaner still, I shall be pleased to pass their ideas on.

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## Spawning of the Arulius Barb

**A**LTHOUGH many of the small barbs will breed readily, it is only rarely that reports are received of successes with the larger species: one of the most important reasons for this must surely be the considerable amount of swimming space they need yet all too infrequently get. One hobbyist, Douglas White of South London, recently achieved a spawning of *Barbus arulius*, an event in which luck appears to have played a major part.

By **CLIFF HARRISON**

The pair were around 2 years old, of 3½ in. body length, and had been brought up (from 1½ in. length) in an all-glass 30 in. by 15 in. by 15 in. tank without any gravel. Their companions included a number of large leeri gouramis and some



Photo: R. ZUKAL

A pair of *Barbus aralis* in a spawning chase in the aquarium

platys, all fed on flake food with live daphnia twice a week. The temperature was kept at around 78°F (26°C), the water hardness was approximately 250 p.p.m., and partial changes of the water were made regularly. A few days after each water change, the barbs would show an increase in coloration, and would chase each other around the aquarium.

### Spawning in Plants

On the particular occasion that was observed there was a cluster of plants floating at the top of the tank—mainly cryptocorynes and Amazon swords waiting to be transferred to another aquarium—and the barbs chased repeatedly through the mass of plants, showering eggs around which were promptly eaten by the other tank

occupants. The barbs continued to spawn at intervals of 2 or 3 days, and on the eighth day after the original spawning a number of minute fry were spotted hiding amongst the plants. Mr White immediately removed the lecris and platys, leaving the parents in, and fed these fry on green water and Liquifry. The parents made no attempt to eat their offspring, which subsequently graduated on to brine shrimp and flake food.

When I visited Mr White there were some 30 young *aralis*, each around 1 in. long, and the larger ones were beginning to develop the adult coloration. Since that week of spawning, the parents have shown far less enthusiasm in their chasing and neither eggs nor fry have been in evidence. It would be interesting to know just what actually triggered off their behaviour for that short while.

# How to Culture Grindal Worms

By W. A. TOMEY

Photographs by the author

HERE is a live food that is worth its weight in gold, perhaps especially when other live foods are hard to find. Grindal worms (*Euchytraea buchholzi*) belong to the worm family Echytraeidae, and they are very small (2-6 mm. long) and thin (0.2 mm. across). Mrs. Morten Grindal of Sweden has the honour of being the first to cultivate these worms as food for aquarium fishes, in the year 1947.

Multiplication of these pigmy white worms is by means of eggs, laid in 'packets' of 10 to 20. The worms are bisexual, i.e. they each have female as well as male reproductive organs, which makes them able to pair with every partner they meet. They have microscopic 'hairs' or bristles on their

body segments and these are necessary for them to move. It's very important to keep the Grindal worm culture apart from the usual white worm culture because in the presence of these larger worms the pigmy white worms degenerate and are lost.

Cultivation of Grindal worms is easy. We need one or more plastic (expanded polystyrene) flowerpots (or foam boxes—see the photographs), about 2 inches high, and we cut a ceiling tile of the same material to use as a cover for the culture. You'll wonder why I recommend this material. Well, it's simple: because this plastic has the very useful qualities of being light and waterproof, yet it both isolates and ventilates. All these are



The picture series shows an expanded polystyrene (plastic foam) box being set up to hold a Grindal worm culture. In the left photograph above the box has been filled with the peat-earth mixture and a groove is made on the surface with the finger. Food for the worms (porridge oats) is placed in the groove (right)



qualities that cannot be done without in the culture of Grindal worms.

The medium for the culture box consists of one-third of peat dust and two-thirds of sifted black earth. Put this mixture in the container to about a quarter of an inch below the edge. As food for the worms we can use various meal products, like quick-cooking oatmeal porridge, softened corn-flakes etc.; oatmeal products often give the best results. The food is placed in a thin layer along a shallow groove made in the peat-earth medium. It should be made damp with tepid water, just enough so that no water runs out when we put

the pot on its side. A portion of the worms purchased to start off the culture is placed on the food mass and the box is closed with its cover and a few elastic bands. The best temperature for cultivation is 68-75 F (20-24 C), when the worms will increase very rapidly. Because it acts as a source of warmth for the culture some aquarists keep their boxes on the lighting hood of the aquarium.

Depending on the number of worms in a box you should feed them once or twice a week, and you must maintain the water content of the medium at the right level. It is better to feed the

Top left: After the worms' food has been placed on the surface it is sprayed to moisten it.

Right: A spoonful of live Grindal worms from an old culture or as supplied from the dealer is added to the layer of oats and the medium is covered with glass.

Top right: A thriving culture with a mass of the worms to be seen spreading beneath the glass.





Collection of the Grindal worms beneath the cover glass of the worm culture facilitates the feeding of them to fish. The glass is picked up and swirled in the aquarium to wash off the worms for the waiting fish. Any of the worm food on the glass should be removed before this procedure is undertaken.

culture twice a week rather than give too much food at one time, because the worms cannot consume the excess of food; this becomes mouldy and unpleasant smells can develop. With inadequate attention to a culture flies and mites can grow in it and these will stop the production of worms. If in spite of careful attention the culture in time develops a smell of ammonia or sulphur, and the worms start to die, you should thoroughly clean the plastic container and start again with fresh medium.

With a really good growth of worms in a culture they will often collect on the underside of the cover, which makes the feeding of them to the fish very easy because the plastic cover can simply be

floated in the aquarium. The worms are obtained in a very clean state and they are eaten very quickly by all fishes. An advantage of Grindal worms is that they do not die immediately they are placed in water, but can stay alive for about 2 days.

Nannostomid fishes, noted for their small mouths, can eat very large numbers of Grindal worms; however, it does not mean that you should give them the worms every day. Variety in the menu is necessary and guarantees good condition of the fish. But there is nothing easier to cultivate than these worms for an aquarist, and they are free from smells and have a high food value for your fish.

Some background information to help in

## Dealing with the Algae

TO the average fishkeeper the algae are a nuisance. They make up the stuff which turns aquarium water green, covers rocks and plants with an unsightly growth and generally speaking defeats the object of maintaining a decorative feature of the home. The efforts of the aspiring aquarist are therefore usually directed towards eliminating the algae or at least controlling them and to do this it is necessary to know something of their origin and function.

Algae are a simple form of vegetation without leaves, stems or roots and they flourish under the influence of sunlight and water. When one considers, therefore, that 90% of the earth's living

By FRED CAMPBELL

organisms is vegetable and only 10% animal, and that some two-thirds of the earth's surface is water, one can get some idea of the percentage of the earth's living organisms accounted for by the algae. There are some 18,000 species, and more are constantly being discovered, falling into several categories each with distinctive characteristics. Familiar examples are the green scums and water 'mosses' we see floating on the surface of stagnant



ponds and the seaweeds we see washed up on the beaches. The wide diversity of form, however, ranges from the minute freshwater species, which generally speaking can only be distinguished one from the other by a microscope, to the massive kelps of the marine world, comparable in size to many terrestrial plants.

It could be said that algae have been the subject of man's deliberations for thousands of years, for references to them have been found in Greek and Roman writings and even early Chinese literature; no doubt Confucius had something to say about them. From the Middle Ages onward, however, the discovery of the utilitarian properties of algae seems to have taken precedence over scientific research. As early as the twelfth century the French were using kelps as manure, a practice which continued for some 500 years until it had reached such proportions that special restrictions had to be placed on their collection. The trade spread to Great Britain and other parts of Europe and continued until the late eighteenth century, when it was discovered that by burning the kelps, and other seaweeds, soda and iodine could be extracted from the ashes. This process was short-lived, however, owing to the finding of salt deposits elsewhere and also other sources which yielded iodine more readily.

In the far east another type of seaweed was put to commercial use by converting it into the jelly-like agar-agar which went into medicinal and culinary preparations. In more recent years the knowledge that freshwater algae are rich in protein has prompted some European countries to experiment in mass production for conversion into edible products, experiments which, so far as I am aware, are still being carried out.

Whatever benefits mankind has derived from algae, however, none can surpass their natural function of contributing to the supply of oxygen necessary for the maintenance of the animal life of our planet. Algae, like the higher forms of plant life, absorb sunlight which gives them energy to build up carbohydrates from carbon dioxide and water and at the same time release oxygen. This process is the reverse of the respiratory process necessary for the survival of the animal kingdom, of which man is a part, so if two-thirds of the earth's surface is sea it is reasonable to suppose that much of our oxygen comes from that source. Why then do we persist in discharging waste oil into our oceans, thus killing off vast areas of seaweed, which not only decreases our supply of oxygen but also results in the death of fish which are part of our food supply?

Considering that marine algae are commonly referred to as seaweed perhaps algae collectively might be described as weeds of the water world. A famous gardener who appears regularly on T.V.

often says that a garden that won't grow weeds won't grow anything. This may be true but if the garden is to be a thing of beauty the weeds must be controlled. Similarly it might be said that an aquarium that doesn't at some time show traces of algae isn't entirely suitable for the higher forms of plant life. Here again, if the aesthetic qualities of an aquarium are to be maintained the algae must be controlled and the way to do this is to ensure that the plants which have been placed there for their beauty consume all the nutrients and leave nothing for their weaker relatives.

There are two types of algae commonly affecting aquaria: benthos, which attach themselves to anything available, and plankton, which is free floating. Benthos is evidenced in the green or blue-green growths which spread over the aquarium glass, rocks and gravel, leaves of plants and anything else within the aquarium. Some take a thread-like form, like dark-green cotton, and attach themselves so tenaciously to plant leaves that any attempt to remove them by hand can often result in uprooting the plant. This thread-like growth is probably the most troublesome of all the algae affecting aquaria for once it gets established only a complete setting up anew will eliminate it.

Plankton become visible as a green suspension in the water and a heavy concentration can give it the appearance of pea-soup. This is not nearly so difficult to remove as the benthos, a reduction in the amount of light reaching the aquarium usually being sufficient. A quick and economical way, if you have a spare tank, is to take out the fish and introduce a quantity of daphnia. The daphnia will get fat off the plankton and make a tasty meal for the fish when these are replaced.

One often hears of brown algae appearing in an aquarium but whether this is in fact a form of algae or not is debatable. There are brown algae, of course, which are classified in the group known as Phaeophyceae (all the groups have unpronounceable names, which is why I have refrained from using them), which comprise almost entirely the brown seaweeds. Freshwater species of brown algae are rare and seldom encountered. If then the water in an aquarium goes brown it is more than likely that the set-up has become unbalanced from an excess of bacteria. Animal plankton is dominating over the vegetable plankton, resulting in a tankful of Infusoria. If, by any chance, a brown filamentous growth does appear in an aquarium then the owner should make a fresh start. The green chlorophyll which is present in all vegetation is, in the case of brown algae, masked by the brown pigment, resulting in a modified action in the process of photosynthesis, so if brown algae is obtaining a suitable combination of chemical compounds, the conditions within the aquarium are unsuitable for the other occupants.

## MARINIST'S Notebook

By ROY PINKS

**M**ARINE fishes are so fascinatingly different that the new marinist all too often has eyes only for their infinite variety and neglects the background against which they will be viewed. The study of fish species is never interrupted by the provision of a suitable background, and in fact in many instances it will be found that failure to consider this point will result in disappointments of one sort or another.

In some respects the new marinist has the advantage that freshwater and saltwater decor are so dissimilar. To some this will prove an attraction in that the possibilities for artistic enterprise are virtually unlimited. To others the fact will just seem to be one of those obvious truths calling for little or no personal contribution on their part, and they will let the raw material which suddenly becomes available to them speak for itself. Both groups of newcomers will probably suffer from the same series of faults, however, if they unconsciously regard a lump of coral as the marine counterpart of a piece of rock in a freshwater aquarium, and if they translate *vallisneria* as sea tree. The result of so doing is that all-too-familiar arrangement of four large pieces of coral in a line, with a tiny piece of sea tree planted in the middle foreground of each of them.

The far-seeing marinist reads up his fish species first, and if he is content with the more modest ones like damselfishes and clowns, he has an excellent opportunity of calling into play all the possibilities of the invertebrate world. The background of his tank will be formed, piece by expensive piece, of 'living rock', and it may take several years for the desired effect to be achieved. Anemones and tube-worms will form the major set pieces, perhaps living coral, too, and as the background is created, the more and more will the observer wish to study it, often armed with a magnifying glass. This technique has no real place for the dead marine decorations like dried coral and sea tree, which take pride of place in collections of fishes which prey on the invertebrates. When one has seen a large uncluttered invertebrate tank containing just a sprinkling of fish, one appreciates that the greater the open spaces the better. Obstructions of any

sort simply get in the way of examining the odd tiny crab, or of appreciating the full beauty of the anemone in some special phase of local lighting.

In many ways the owner of the invertebrate tank can afford to be a bit lazy. Many of his charges will find their own way around, and whatever he does by way of tank arrangement will be provisional only. In the early days this will prove extremely irritating if the arranger has set out with preconceived ideas, but in the long term he might well conclude that Nature knows rather better than he does. The aquarist with a mixed collection will again need to study the habits of his fishes. Some will need bold schemes involving large free swimming areas, whilst others will demand numbers of crannies into which fishes can retreat either because they are bullied or because it is their nature to have something solid to peer round. On the whole I have found that the various forms of cup coral constitute the best set pieces from a decorative point of view, and that the red organ-pipe coral is most useful for sides and backgrounds. The latter is not naturally very suitable for hiding places, though holes can certainly be gouged from it if desired—a rather money-wasting process when it is remembered that one buys the stuff by weight!

Most of the white corals have a definite value as hiding places. Small fishes simply sink between the pinnacles, and larger species take refuge between the individual pieces. Keep sharp pieces away from the front aquarium glass, and as far as possible, from the sides. Contrary to common belief, coral fishes can injure themselves against sharp coral if they panic or if they are being netted.

Whatever your personal notions are about marine decor, it is probably worth accepting that, especially in non-invertebrate collections, the effect is going to turn out looking pretty artificial to the practised eye. Therefore, look at all the colour television on the subject that you can, and consult all the large glossy books with colour plates of undersea shots. At all costs we must get our marine tanks not just looking different from freshwater ones; they must be meaningfully distinct from them, which is quite another thing.

## A Spawning of the Red-Spotted Copeina



*Copeina guttata*

By RUDOLPH ZUKAL

Photographs by the author

THE red-spotted copeina has been a welcome, but unfortunately not-too-often seen, occupant of fishkeepers' tanks since as long ago as 1912. Its trout-shaped body is relatively powerful, and reaches a length of about 4 inches (10 cm.). The literature, it is true, specifies still larger sizes, but personally I have never seen one larger than 4 inches. Its fairly large scales each bears a red fleck. Its back is greenish brown, the sides of its body are gleaming bluish, its belly is white. The upper part of the iris of the eye is red. The dorsal fin has a black, pear-shaped fleck, but otherwise the fins are transparent and of a yellowish white colour. Sex differences in adult fish are best recognised by the male's dorsal fleck, although this disappears with increasing age. The male's 'vertical' fins are pointed and reddish in colour. The female's fins are colourless.

*Copeina guttata* are peaceful, even a little timid, and they can very easily be made to jump out of the tank. They can be kept with most other species of peaceful tank inhabitants including the smaller characins. They eat everything and will even take vegetable food as a change. I keep them in a 22 gallon (100 litres) tank together with other pairs of fishes that I have removed from their home tank for breeding purposes. Before this I kept them in a still larger tank that was planted rather thickly, and because of their timidity I hardly ever saw them. Their present tank is not so heavily planted and here

Illustration by F. MARSH

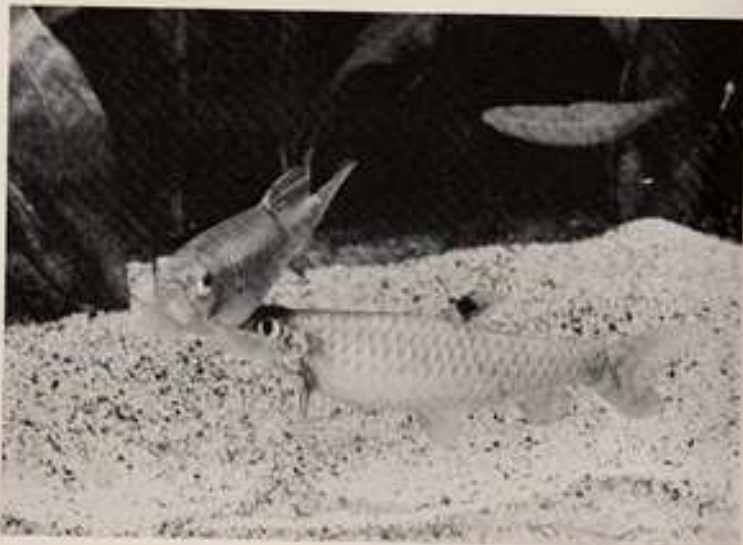


In the early stages of the courtship the male (closest to the camera) persistently attempted to press against the female's side and swung his caudal fin over her body.

they have partly lost their nervousness but, unlike the other fishes in it, they always shoot to the back of the tank when I approach. Ordinary tapwater is used at a temperature of 72°F (22°C); our water in Brno has an average hardness (DH) of 10-14 and the pH value fluctuates between 6.8 and 7.2.

Before I describe the spawning I should like to mention two points. I knew from the literature that changes in atmospheric pressure have a great

influence on fish behaviour. When the atmospheric pressure rises (under conditions of fine weather), most species of fish spawn readily and in community tanks there is evidence that a period of great stimulation is taking place. I have myself confirmed this over the course of many experiments. The other point is that if fish are just about to start spawning or are even in the middle of it you cannot easily disturb them. The spawning pair can even be moved from one tank to another



As the courtship progresses the pair of fish leave the upper levels of the water and stay close to the bottom. Here the male is seen to be nudging the female.

As the pair circle around just above the gravel this becomes disturbed and swirls away so that a hollow is formed. In this the spawning will eventually take place.

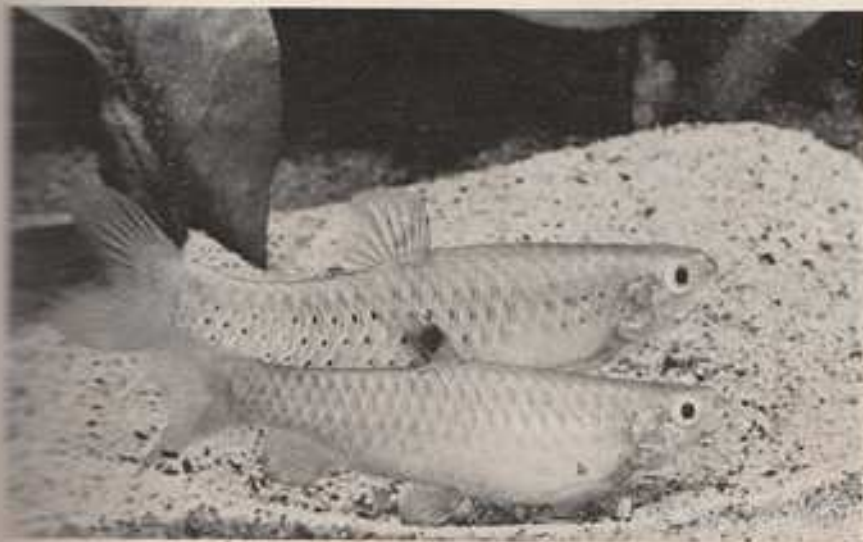


and, after a short pause, they will go on spawning quite happily. This certainly applies to characins and it is so even with the rather timid *Copeina* genus.

One morning, while I was feeding my fish, I saw how the male with his large, red-coloured anal fin was moving across and around the female. Everything pointed to the foreplay preceding spawning. I had nothing to hand other than a small glass tank of about 1½ gallons (8 litres) capacity. I knew that this container was far too small, but I really had no option if I was going to be able to photograph the spawning. I thoroughly washed some fine sand, almost filled the tank with

water from a community tank and topped up with about half a gallon of already warmed tap water. The temperature was raised to 81°F (27°C). At the back of the tank I placed some ordinary plants and in the foreground I put a large *Echinodorus paniculatus* leaf. The fish themselves could choose!

After the pair were transferred nothing happened for nearly an hour. By this time it was 8.00 a.m. There were a few floating plants on the surface to reduce the light from above. Then marvels happened! The male's fins, which had turned very pale, took on their reddish colour again and the courtship began.



By lying in the hollow and quivering his body the male appears to entice the female to join him. Here the pair are shown in the spawning position with the male ready to fertilise the eggs as they are laid.

At first the male swam round the stationary female. Then both fish swam restlessly through the tank while the male tried to press himself against the female's side and put his caudal fin over her body. By degrees the fish left the upper levels of the water and kept nearer to the bottom of the tank. From time to time the female was rammed in the belly by the male but there were no hard blows, and though she was trying to avoid the ramming with circular movements she swam always nearer to the tank floor. Once both fish had reached the bottom they made a small trough in the sand and gradually enlarged this by making circular movements. All the time, with the sand swirling away, the two fish came nearer to each other. Then the male laid down in the depression,

quivering his body and enticing the female. As soon as she came, he swam up to approach her from above and to push her into the sand. Finally, once the female had taken up the correct spawning position the male was immediately at her side and the fish spawned.

The spawning procedure lasts between 2 and 4 hours and, according to the size of the fish, 500 or more eggs can be produced. Once the spawning is complete it is necessary to remove the female and leave the male to take over the care of the eggs. The fry hatch after 36 hours and then the male, too, must be removed. Three days later the fry are free-swimming. They will do well on the finest possible live food but they are very sensitive to any change in temperature in their early days.

## Readers' Queries Answered



### End of the Tail

*A female sword in my tank has been very badly bitten in the tail by, we think, a tiger barb. This all happened over 2 months ago but although the tail has not shown fungus in any way it does not appear to be re-growing. I thought that fins when bitten regrow again fairly quickly?*

It is possible that the damage to the caudal fin was so great that the missing section will never grow again. Without seeing the missing section of tail it is difficult to assess this, but if any of the fin rays were damaged down to the root part then regeneration will probably not occur.

### Livebearers

*I write to ask you if there is any cure for mouth fungus, the disease that eats away the mouth. I had to kill 15 mollies with it last week. I have only just started my aquarium about 6 months ago and don't know much about it yet. At the weekend I had two guppy females having babies and between them I have 357 live babies. I don't suppose I shall rear them all as it seems such a lot for only two fish to have. We know that there were also 14 dead babies. Is there any advice you can*

*give me for rearing the rest of them?*

Mouth 'fungus', to which black mollies seem peculiarly prone, is really a bacterial disease caused by slime bacteria, *Chondrococcus columnaris* or other related species. It is infectious but fairly easily controlled provided it is treated quickly with a phenoxethol cure obtainable from your local aquarist shop, or with terramycin obtainable from your veterinary surgeon (50-100 mg. per gallon of tank water). For 15 mollies to have developed mouth fungus so badly that it was necessary to kill them we would suspect that the condition of the tank requires very careful consideration after it has been treated. You do not give dimensions for your tank (or tanks) or the number of fish contained in it, but overcrowding of a newly set-up tank can very quickly bring about a state of affairs where the fish are in a debilitated state and disease is far more likely to spread. Mollies in particular like a roomy, well-planted tank with moderately hard water and with possibly a little sea salt added to the water (after this is first dissolved in a little tank water, one teaspoonful per 3 gallons of tank

water). They also require plenty of vegetable matter such as algae or boiled lettuce or a little cooked spinach. Temperatures should be kept in the region of 75-80°F. Check that your tank contains only a suitable number of fish (1 inch of fish body to 12 square inches of water surface is a rough guide). After treatment of the whole tank the mulm should be removed from the gravel surface every week with a siphon tube and the water taken out replaced with fresh water.

The guppy fry count seems unusually high. The greatest problem in rearing them will be with regard to space unless you have a number of tanks available (say six or so). It is best to rear them in unplanted tanks without gravel, and the more space they are allowed the bigger they will grow. Feeding (small quantities at a time) of fine dried food should be very frequent but the tanks must be kept scrupulously clean, the mulm removed weekly and about a third of the water replaced every week.

### Sucking Loach Breeding

*I cannot find any details of the breeding of the sucking loach or Chinese algae eater in my tropical fish books. I am asking you for details of the breeding of this fish. I have had one of these fish pregnant but due to my lack of knowledge I could not save the fry.*

There are no reports in the

*Continued on page 605*



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COLDWATER SCENE



By FRANK W. ORME

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## Dealing With Early

### Spawnings ● Culling

#### the Youngsters

WITH the coming of spring, according to the poet, a young man's fancy turns to thoughts of love. The goldfish keeper, however, turns to thoughts of breeding his fish. He visualises a pool of clear water, large numbers of healthy fish gliding between the submerged plants as a warm sun slants its rays from a blue sky, into the depths of the water.

Examination may find the picture less appealing; if the fishkeeper shirked the autumn task of giving the pool a pre-winter clean-up, it will be necessary to give the pool a spring clean.

The work of cleaning the pool, as detailed in the October, 1973 issue of PFM, should be attended to as soon as possible, otherwise the disturbance will cause a setback to the adjustment of plants and fish to the changing conditions caused by longer hours of daylight and increasing water temperatures.

At this time of the year many of the pond plants can be divided and propagated. Overcrowded areas can be thinned out, dead plants removed and new species planted. When completed the vegetation should provide areas of shade, spawning areas and places in which any newly hatched fish can hide from their enemies. The planting should leave adequate stretches of open water so that the fish can swim freely without impedence.

Spring passes all too quickly and now is the time to recondition the pool, so that full enjoyment can be derived from it during our all too brief summer months.

Having returned the fish to the pool they can be offered a little chopped earthworm, but only as much as they will take readily, increasing the amount of this, and other foods, as the weather improves and the water warms up.

In February I described the preparation and breeding of goldfish for March. You may have been fortunate and obtained an early spawning but, if you are still trying, do not worry—there is still ample time. Feed both potential parents with plenty of chopped earthworm until they have reached full breeding condition and keep them separated until you are ready to try to spawn them. Remember that patience goes hand-in-hand with the breeding of goldfish and too much interference with the fish may well deter them. When the female is plump with eggs and the male is swim-

ming actively, with erect fins, and exhibiting the small white tubercles (pimples) on the front rays of his pectoral fins and gill plates, the pair can be placed together. If all other factors are correct, you should be repaid for your patience with a good spawning of eggs.

A fully grown female is capable of laying over 5,000 eggs during a single spawning. Of course, it is unlikely that they will all be fertilised but a great many will be. Space is of paramount importance and the average amateur would find it impossible to raise all of the fry that hatch out. In order to give the best fish sufficient room in which to make satisfactory sturdy growth it is essential that they are culled, so that all undesirable types are eliminated, and this must be commenced as early as possible or Nature will take a heavy toll. Disease in an overcrowded tank can quite easily wipe out an entire spawning and the least of the troubles would be stunted weakly fish that would not be a credit to the breeder.

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The culling can commence when the young fish are approximately 1 month old and should continue at regular intervals thereafter. For this operation the following equipment will be required: two clean containers filled with water at the same temperature as the fry tank (one for the selected fry and the other for those which are rejected); a clean white hand bowl, a large fine-mesh plastic flour sieve, a small plastic tea-strainer, a magnifying glass, a pencil and notepaper to keep a count of the chosen fish. In fact I place a card on each tank, which gives details of the parents together with the dates of spawning, hatching and when the alevins became free-swimming. On this card is noted the number of fry that the tank contains, and with each culling this number is reduced accordingly.

Place clean water, at the same temperature as that in which the fry are swimming, into the white bowl. With the flour sieve carefully catch a few of the young fish and gently place them into the bowl, where it will be seen that they show up quite plainly against the white background. Any malformed fish, for example one that is bent or



deformed in any way, must be removed. Place them in one of the previously prepared receptacles and again look at the fish in the bowl, to ensure that none has escaped detection. If you are sorting single-tailed fish there is nothing else to look for at this stage. However, if the fry are from a twin-tail goldfish spawning a much closer inspection is now required of the remaining fish.

With the magnifying glass closely examine the tails; the tail should appear wedge-shaped. Take out all those which have single tails. Having chosen the twin-tail fry it must now be seen whether the tail is divided; again look at the tails and if there is no sign of a central split, or division, get rid of the fish. A webbed tail will not divide later and the fish will occupy much needed space.

Continue this sorting procedure until the tank has been emptied of fry and all have been graded into their respective receptacles of potentially good and those which are of no use; these latter can then be fed to the adult fish as live food.

The emptied tank can now receive a thorough cleaning, after which it should be re-filled with fresh water, making sure that the temperature is approximately the same as that in the container of selected fry. Replace the chosen fish in their growing-on quarters, dividing them by number proportionate to the size of tank, and make a note of how many you place in each available tank.

Slowly increase the temperature to between 65° and 70°F (18°-20°C), which will maintain a noticeably steady rate of growth, and provide an ample nourishing diet. This diet can be of brine shrimp nauplii, until the fish outgrows it, together with micro worms, well-mashed whiteworm and sifted dried foods. As the young grow add sifted daphnia and gradually increase the amount and size of food offered, make sure that all food is being eaten within a short time. Ensure that the stomachs of the young fish are kept filled, without over-feeding the water.

As the young fish grow notice how the fins develop until the babies become recognisable as miniature fish; the colours of the nacreous varieties gradually become evident and the scales of the metallic types begin to be more easily seen as they catch the light. In due time all of these developments will have to be studied in greater detail and further cullings made, so that only the best fish are kept. These further sortings will be discussed more fully during the following months.

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Quite recently I have read *LIVE JEWELS*, a book about koi, written by Masayuki Amano and published in Japan during 1968. Profusely illustrated with coloured pictures, which have both Japanese and English captions, the book amply demonstrates the many colourful varieties of this fish that are

produced in Japan. The koi enthusiast will find the plates a delight and probably cause him some envy. Unfortunately the bulk of the text is printed in Japanese and is therefore incomprehensible to anyone, such as myself, who cannot read the language. Inclusive of the colour plates the book contains a total of 207 pages, and of these approximately 24 are written in English. However, the contents of these pages proved most interesting to read. The Appendix, for example, which is written by Dr Komei Koshihara, contains an amazing claim in respect of six fancy carp that inhabit a pond situated at a place known as Oppara, which is in the Kamo county of the Mino Province of Japan. It seems that, according to the writer, these fish had been alive during his grandmother's childhood, and therefore at his request scales from the six fish were examined by Professor Masayoshi Hiro D.Sc.

Over a period of 2 months these scales were examined in minute detail and the result re-checked. From a count of the scale growth rings these fish were credited with the staggering ages of 217 years, 170 years, 155 years, 151 years and two of 141 years!

At various times the aquatic press has carried letters from proud owners of aged fish, claiming a record for their pets, but if the facts are correct, our koi-keeping friends will in the future be able to lay claim to all records of longevity for their pet. Just think—present-day fanciers of the coloured carp could well be raising living heirlooms to be passed down to their distant descendants of the future!

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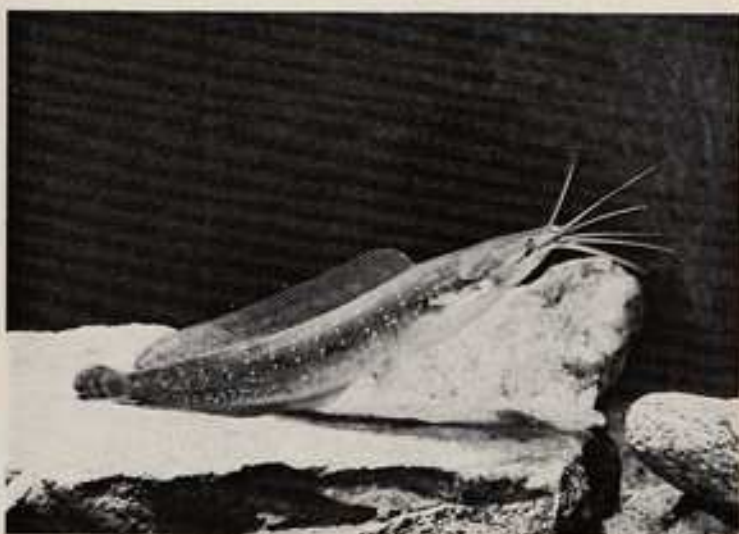
Contrary to my article in the January 'Coldwater Scene', when I suggested that Midlands did not appear interested in forming a specialist goldfish society, I can report that such an organisation has been founded and bears the title of the Association of Midland Goldfish Keepers. Open to all goldfish keepers, irrespective of experience, it will hold its first meeting during this month. This is one occasion that I am pleased to admit that I have been proved wrong.

If other areas have formed, or are forming, a similar specialist coldwater society I shall be pleased to hear of the progress made c/o the Editor of *PFM*.

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*AN ASSOCIATION OF GOLDFISH KEEPERS* is proposed for the Midland area and interested persons should write for details to Mr Frank Orme, 94 Newman Way, Rubery, Birmingham B45 9LZ. Among those supporting the proposal are Mr Tony Roberts, the well-known Birmingham exhibitor of moors, and Mr Dave Eastwood, secretary of Coventry A & P.S.

# Catfish for the Specialist



*Clarias angolensis* in a favoured position on the aquarium rocks

By **RUDOLPH ZUKAL**

Photograph by the author

**T**HIS catfish is very little known among aquarists in my country—indeed I should say rather that it is practically unknown. It inhabits both fresh and brackish waters in Lagos in the Niger estuary, in the Cameroons, in Gabon, the Congo and in Angola where it reaches the considerable size of 14 inches (35 cm.), though in captivity it is, of course, smaller.

Its background colouring is coffee brown to blackish with a bronze glint along its back. The sides of the body are decorated with numerous light flecks. The belly is strikingly lighter and the light brown is mixed with gold or white. The fins are thick, greenish and opaque. The caudal fin carries a darker border.

We received our *Clarias angolensis* at our permanent Exhibition in Brno from our friend Herr *Erlensky* of Budapest when it was about 4½ inches (12 cm.) long. Taking into consideration our specimen's appetite, we were concerned about how quickly he would grow. For breakfast he would quickly gulp down a hazelnut-sized ball of tubifer worms and with this 'worm ball' clearly

visible in his stomach he would search about in the 13 gallons (60 l.) tank for a quiet place where he could digest it undisturbed.

His tank companions were *Heteropneustes* species. Although he sometimes reminds one of a torpedo, our *Clarias* often takes up a majestic position with his front end propped up on a stone or root so that he has a view over everything. He is not at all timid. In fact, with his flat, broad, head with its obliquely placed large mouth he appears positively frightening and quite rightly, too, since the few small fish we put into the tank all disappear after a few hours! Eight fairly long barbels adorn the front of the head.

In their natural habitat these fish often live in water that is poor in oxygen and so Nature has provided them with auxiliary breathing organs, placed behind the gill openings. The result is that fish of the *Clarias* genus can live for several hours out of water in damp mud and they often crawl on to the land at night to search for food. Sex differences are not known and they have not yet bred in captivity.

## Bacopa — An Attractive Aquatic



By KAREL RATAJ

Photographs by RUDOLPH ZUKAL



THE water hyssop (*Bacopa monnieri*) belongs to the figwort family (Scrophulariaceae). It is only slightly similar to the second cultivated species, *Bacopa amplexicaulis*, even though it, too, has opposite, alternately arranged, pairs of leaves. In Nature it grows in the whole tropical and sub-tropical areas of the world. Its stem, both in emergent and in submerged form, is here moderately prostrate, rooting, and erect parts of the stem are 6-8 inches (15-20 cm.) high; unlike the stem of *B. amplexicaulis* it is strongly branching.

Leaves are minute, 10-20 mm. long and 5-8 mm. wide. Both leaf surfaces are green, without distinct veins. Leaves are much thicker than those of *B. amplexicaulis* and are not undulate.

This species flowers only above water, the flowers growing on short pedicels from the leaf axil. The pale violet flowers produce seeds.

Flowers can be seen on short stalks arising from the leaf axils of these stems of *Bacopa monnieri* growing out of water.

readily, but as the plant is perfectly well propagated vegetatively by rooting the stems it does not pay to cultivate it from seeds. The roots may arise in the places of the insertion of the leaves, which are always opposite (two by two, facing each other).

Under water this plant grows relatively slowly and is not prostrate, so that it does not spread

broadly in growth, but forms a decorative small 'shrub'. It is advisable to grow it first out of water in the paludarium or terrarium and only then to plant the developed, branching plants under water.

*Bacopa monniera* is light-loving, and does not tolerate dark positions as does *Bacopa amplexicaulis*.

## Reader's Queries Answered

continued from page 604

literature of this fish having been found in the aquarium. In fact, the only known sex differences are those reported by Gunther Sterba (FRESH-WATER FISHES OF THE WORLD), that the female is the heavier fish and that the female has 'fewer tubercles on the snout' than the male. Although you mention the word 'fry', which would suggest that eggs had hatched, in the absence of further details we would think that the 'fry' were in fact those of another species and not those of *Gyrinocheilus aymonieri*.

### Spawning Frequency

Can you please tell me when I can expect zebbras to spawn again? They have just done so but I wasn't expecting it and hadn't made preparations to prevent the eggs being eaten. I would like to try to hatch the next time but don't know when to expect this to happen.

Results of some very interesting experiments with zebra spawnings have been reported by Mr Albert J. Klee in ANGLIOR, the journal of the San Francisco Aquarium Society. These experiments were conducted by K. K. Hisoaka and C. F. Firlit of the Department of Biological Sciences, Loyola University, U.S.A. At a temperature of 79°F (26°C) it was found (a) that a minimum of 5 days was required between spawnings and that 'eggs were laid in large batches every fifth day after the previous spawning with marked precision' and (b) that eggs might be

laid between 5 and 45 days after the previous spawning but that more of the fertilised eggs obtained 5-10 days after the previous spawning survived than the eggs laid from after a rest period of 15 days, which produced increasing numbers of deaths and abnormalities. Temperature, it was found, played a vital role in the length of the egg cycle. At 84°F (29°C) the interval between spawning was only 3 days and at 86°F (30°C) only 2 days, while at 72.5°F (22°C) no spawning was achieved. The number of fish involved in these experiments was small and the results could be said to be absolutely valid only for the conditions under which those particular fish were kept, but the data provided are helpful enough for a breeding programme to be based upon them.

### Lace Plants

I have been completely unsuccessful with Madagascan lace plants, or rather with the two that I bought only 2 months ago. I have given them plenty of light, planting them under a 40 watts bulb that is illuminated for up to 10 hours a day.

It has been found that illuminations is not the critical factor with these plants since in Nature they grow in a variety of positions, some where they might receive quite a lot of sun or in rivers that are overhung by trees that provide a great deal of shade. Hints given by successful

growers include growing-on the plants, in a small tank on their own for sturdy initial growth in planting pots (plastic pots holed all round), in a mixture of one-fifth loam to four-fifths gravel. Most of the water in this small tank, which is filtered through peat moss, must be almost completely changed weekly. But the main secret of good growth is often claimed to be the 'resting' period. Normally the plant does well at a tank temperature of 72-75°F, but the plant can be removed for several months during the year to a small tank in which the temperature can be lowered to 60-68°F; without this resting period the plant is said not to survive for long, although it is difficult to see what natural environmental factors this is simulating.

### Breeding Alestes

I have an unmistakable pair of *Alestes longipinnis*. Can you please give me some hints on spawning them?

Although it is not difficult to sex these fish, since the male has a greatly extended and more pointed dorsal fin, there are no details available of the spawning procedure of this fish in captivity. Most likely the conditions reproduced in the aquarium, perfectly suitable for their satisfactory maintenance, do not approximate sufficiently closely to conditions in their natural habitat (the area of Africa across the bulge from west to east). Most fishkeepers have barely space available for a few specimens of the species, since they grow from 4 to 5 inches in length and require large, roomy tanks with plenty of swimming space. But in Nature *Alestes longipinnis* is a shoaling fish and as such may be a 'community' spawner, requiring a fair number of both sexes to be present when the spawning starts. Correct feeding is also important in bringing a fish into spawning condition, and although this species is a hearty eater and will take dried

food as well as live food in the tank, in Nature it consumes a fair quantity of insect life, which is usually entirely lacking in the aquarium.

#### Fry Food

*I planned to start an Infusoria culture for a spawning of dwarf gouramis but each time the Infusoria has become so smelly that I have had to throw it away, since I have been frightened to feed it. How can I prevent this?*

There is no need to prevent this as it is all part of the process whereby the Infusoria grow. Your scalded lettuce leaf-water mixture is merely providing the bacteria on which the Infusoria, spores of which occur in the air, will feed as they arrive in your culture. The rapid growth of the bacteria causes the water to become cloudy and somewhat smelly but as soon as the Infusoria start feeding and thriving they will reduce the bacteria, until about 10 days after the culture is first made the water will have 'cleared' and become quite odourless. After a few more days the culture is ready to feed to your fry. If you plan to rear the



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fry on this Infusoria, rather than use a food such as Liquifry, then you must have a good supply available. If you start your first batch 12 days or so before the fry will be ready to feed, the next batch 2 days later, the third batch 2 days after that, and so on, you will not risk running out of this food at a crucial point in rearing the young. You have been scrapping your cultures too soon.

## Aqua GLOSSARY

No. 16

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

**Neo** (Greek): new. Pronounced 'nee-oh'. Used as a prefix to other, older and classical names. For example, the Australian lung fish, *Neoceratodus* ('nee-oh-ker-rat-oh-duss'), a 'new ceratodont', the genera *Neolebias* ('nee-oh-lee-by-ass') and *Neotoca* ('nee-oh-toh-ka').

**Pom** (-a, -o) (Greek): cover. Pronounced 'poh-mah, poh-moh'. Most often used in names to indicate features associated with the gill covers. For example, in the marine angel fish genus *Pomacentrus* ('poh-mah-sent(kent)-russ') the existence of spines on the gill covers is indicated. Likewise the generic name of the swordtail characin, *Corynopoma riisei* ('kor-rin-oh-poh-mah riz-zee-eye), denotes the presence of gill-cover appendages (*coryno*, Greek: club).

**Spheno** (Greek): wedge. Pronounced 'sfen-oh'. Used in the trivial name of the mollie, *Mollienesia sphenops* (mol-lee-en-ee-see-ah sfen-ops') to denote the wedge-shaped head of this fish.



MR M. Graham, P.R.O. of WEL-WYN GARDEN CITY AS reports that members were richly rewarded in their two January meetings. The entertainment value alone of the scintillating and witty talk by Mr D. Mills on 'Egglayers I have Bred' made it a night to remember, and there was the added bonus of all the little bits of 'know-how' so necessary for successful fish-breeding. Mr Mills' return visit on 6th May when he will talk on angels, is eagerly awaited. The second meeting benefited greatly by a visit from Mr A. Tuffs and some of the members of HEMEL HEMPSTEAD AS. Mr Tuffs' jovial disposition and wit helped the evening go with a swing, and he also judged the Fish of the Year contest. This was won by a *Namacara anomala* owned by Mr P. Sweet, and was, in the judge's view, a future open show champion. During the evening a set of slides on cichlids were shown for open discussion and younger members. Ian Pitts, David Collis and Andy Margrove showed they are obviously developing into cichlid experts.

MR Bill Scott writes: "Just a line from SOUTH SHIELDS AS. In the course of our wanderings to various parts of Old England and meeting some great guys in the fish world, I thought, as P.R.O., I'd like to mention that our third Open Show takes place on 23rd June, 1974 and we are endeavouring to make it a real good'n. We'd like to see as many folk as we can. As in the past 2 years our venue will be the Bolingbroke Hall. For the previous 2 years we had 490 and 493 entries—we'd love to make it 500 plus, so come on lads and lasses. Welcome to you all."

1973 proved to be another big growth year for the BRITISH MARINE AQUARIST'S ASSOCIATION, with membership almost topping the 500 mark. Overseas members live as far away as Australia and Hawaii. The Association's monthly MARINEWORLD has continued to improve in quality and content. In addition to the present line drawings, it is hoped to

include photographs in the very near future. The Association's booklet **TROPICAL MARINE AQUARIA—AN INTRODUCTION** by the London and S.E. Group has been a conspicuous success in initiating beginners into the art of marine fishkeeping. Local groups of the BMAA have staged displays at some of the larger fish-keeping shows. The London and S.E. Group recruited a large number of new members at their stand at The Aquarium Show '73. The *Ornamental Correspondent* has established a two-way flow of information and ideas between the BMAA and marine aquarist societies and institutions abroad. It is now possible to see the BMAA at any time in the year for a full 12 months. Existing

members who have not received **MAINTENANCE** should check to see if their subscriptions are due. Marine aquarists interested in joining this very progressive Association should write to the secretary, Mr J. Vickery, 26 Rosalind Avenue, Bramford Estate, Woodsetton, Dudley, Worcs. (S.A.E. please).

THE annual cups and trophies of **ILFORD & DA & PS** have been presented to the following: The Festival Cup, which is given for the efforts and work done for the Society during the past year, was won by Mr D. Scaman (2, Mr M. Shadrack; 3, Mr M. Berger). The Table Show Cup, points for which are given for placings in the monthly

table shows during the year, by Mr W. Rowe (2, Mr H. Berger; 3, Mr D. Scaman). The Home Aquaria Cup was won by Mr D. Scaman (2, Mrs P. Reade; 3, Mr R. Roth). At this meeting the table show was furnished 4-inch square show jars. Some entries represented a normal furnished tank, others caves, rock pools, and the club badge. The winners were: 1 & 2, Mr D. Scaman; 3, Mr M. Shadrack. A new competition this year is for snails. Heats will be run during the year for size, speed, colour etc.; this month the 'speed trials' were held, and after many disputes and disqualifications Mr C. Hackshall's entry was declared the winner.

## In Brief . . .

... **NEW** Society, **CLWYD AS** (Val of Clwyd) has its headquarters at the Wynanting Hotel, Rhyl. Meetings are held fortnightly on a Tuesday at 7.30 p.m. Table shows are held monthly, non-members welcome at all meetings. For further information please contact secretary Miss S. Parker, 2 Abbey Street, Rhyl; phone 55595.

... **PLEASE** note! The venue for the **AIREBOROUGH & DAS** Open Show (28th July) differs from that used last year. It is to be held at the Menston Community Centre, Main Street, Menston (½ mile off the A64 Leeds to Ilkley Road). The date for the Inter-society Show is 23rd April at the Greenacre Hall, Rawdon, nr Leeds.

... **MR R. E. Tyler** and **Mr J. Short** from Corby AA gave an interesting talk to members of **PETERBOROUGH FA** on live foods. **Mr D. Jones** and **Mr R. Wilson**, also from Corby, made the following table show awards: 1 & 2, **Mr J. Butler**, joint 3rd, **Mr R. Walden** and **Mr J. Butler**.

... **PLYMOUTH AS** members heard two excellent lectures recently—one by **Mr B. Reid** on guppies and the other by **Mr M. Leeder** on the care and breeding of catfish. **Mr D. Kirby** won in the table show with an *astaxus* barb.

... **THE BIRMINGHAM SECTION** of the **FANCY GUPPY ASSOCIATION** report a very full programme for 1974; many newer members are progressing well with their guppy breeding. **Mr & Mrs R. Jones** have attained their silver pin and **A. C. & L. Truman** their gold pin. New members and visitors are very welcome.

... **MR G. Castle** of **TROWBRIDGE & DA & PS** won the Society's award for most points, 1973 table shows, and **Mr C. Cuss** the shield for best furnished aquaria (for the second year). Table show cards have been presented to: **Fighters**: 1, **Mary Cuss**; 2, **Mr R. Cotterill**. **Swordtails**: 1, **Mr C. Cuss**; 2, **Mary Cuss**. **Catfish**: 1, **Mr G. Castle**; 2, **Mr M. Patrick**.

... **MR A. Lawman** gave a talk on filtration and the problems he overcame with his own newly completed system to members of the **ASSOCIATION OF GOLDFISH BREEDERS**. **Mr L. Clements** won in the *av* class table show.

... **AT** the **WESTON-SUPER MARE & D TFC** Open Show (21st August, see Dates for Your Diary), there will be 26 classes, a cup for every class winner to be held for one year, and a shield to be kept by each class winner. In addition, there will be a prize to the value of £5 for both the best fish of the show and competitor with most points.

... **BECAUSE** of circumstances beyond their control **LINCOLN &**

**DAS** have had to alter the date of their Open Show (at the City Sports Centre, Skellingthorpe Road, Lincoln) to the 30th June.

... **MEMBERS** of **BRISTOL TFC** very much enjoyed the talk and slide show on killie fish of Africa given by **Mr B. Evans**.

... **SEPTEMBER** is the month set aside for the **GOLDFISH SOCIETY OF GREAT BRITAIN** Open Show; date and venue will be announced later. Members at the January meeting found great interest in the illustrated talk given by **Mr Hardy** on fish diseases and experience gained whilst importing fancy goldfish and koi from Japan and Italy.

... **WHEN RHONDDA AS** entertained Swansea AS at their new headquarters the occasion was the final of the Zone-3 Inter-club Competition. Rhondda won by 27 points to 15 and report with pleasure that all card-takers were junior members (**S. Burt**, **M. Smith**, **K. Williams**, **M. Thomas** and **M. Cryer**).

... **WHEN** the advertised lecturer was unable to give his talk, members of **BRIGHTON & SAS** were able to call on their own talents to provide a most interesting evening. A quiz compiled by **Mr S. Feek** was won by **A. Brooks**, a junior member, and four of the members gave 3-minute lectures on various fishes and their environment. **FRAS** judge **Mr C.**

Corbin presented Mr B. Sayers, one of Brighton's newer members, with his first table show award card.

... A TAPED lecture on breeding black mollies and livebearers proved very popular with members of SUFFOLK A & PA recently.

... ABINGDON AS participated in their first 12-a-side match against another club when they were guests of Didcot AS at the Esso Research Station. Although the host club took the well-deserved first place, Abingdon members were delighted to have lost by so few points (861 to 865).

... AT the recent meeting of the Management Committee of the BRITISH KILLIFISH ASSOCIATION, registrar Mr P. K. Brown (Rushen, Elm Grove, Eccleston Park, Prescott, Lancs. L34 2RX) reported that membership had now passed the 500 mark.

... THE chairman of NEW FOREST AS welcomed friends from Bournemouth AS who had come to judge the table show at the January meeting. Available for members to purchase was a varied selection of rocks from the Lake District. The main item was a most entertaining slide show by Mr G. Danby on cichlids, with some of the more unusual types, including some from East Africa, on view. Of interest to newer members were the various types of spawning carried out by this family. Table show results: Labyrinths: 1 & 2, Mr M. Aust; 3, Mr D. Harding. Catfish: 1, Mr D. Harding.

... AN audience predominantly composed of coldwater fishkeeping enthusiasts at BRISTOL AS nevertheless found the slide show on killifish given by Mr Gordon Churchill extremely entertaining.

... THE next meeting of SLOUGH & DAS will be held on 17th April at The Friends Meeting House in Ragstone Road. The theme will be 'Judge your fish Yourself' and Mr Harry Towell will be present to help and give advice on judging.

... MEMBERS of HASTINGS & ST LEONARDS AS very much enjoyed the Hendon AS slide/tape

## FEDERATION



## NEWS

### New Programme

Aid on  
Keeping  
Killies

THE Federation is pleased to announce further programme aids and publications for the benefit of its member Societies.

The two new booklets now available are: no. 4, THE NATIONAL SHOWING GUIDE FOR GOLDFISH, and no. 5, THE CONSTITUTION AND RULES OF THE FED.

A further tape/slide programme, no. 5—'Keeping Killies' by Cyril Brown, has been added to the list of programme aids, and no. 6—'Plants' by Bernard Pye, should be available in the very near future. Thanks to the co-operation of Societies the flow of tape/slide programmes is progressing very smoothly, thus necessitating only the minimum of delay in recirculation. News of further titles, when available, will appear in the Federation's quarterly Bulletin.

### Forthcoming Championship Class Shows

9th March	Catfish Association	H	Corydoras & Brochis
6th April	Thurrock AS	L	Loach
14th April	Mid-Kent	Xb-m	Breeders egglayer (tropical)
21st April	Medway	J	Rasbora
27th April	Riverside	Dc	Rift Valley cichlids
11th May	Southend, Leigh & DAS	Cz	Characin
11th May	Port Talbot AS	Xo-t	Breeders (livebearer)
26th May	Corby & DAS	Nb-m	Pairs (egglayer)
2nd June	Sudbury AS	K	Danio & WCMM
8th June	Llantwit Major	Q	Swordtail
9th June	Brighton & Southern AS	G	Tropical catfish
29th June	Dunmow & DAS	No-t	Pairs (livebearer)
6th July	Basingstoke AS	Db	Dwarf cichlids
4th August	Tunbridge & DAS	T	a.o.s. Livebearer
1st September	Newbury & DAS	R	Platy
1st September	Bethnal Green AS	W	a.o.s. Coldwater
2nd September	Harlow AS	P	Guppy female
14th September	Bracknell AS	Ba	Barb
14th September	Hounslow & DAS	V	Twintail goldfish
5th October	East London A & PA	Z	Plants
22nd October	North Kent AS	F	Egg-laying toothcarp
10th November	Walthamstow & DAS	Xu-w	Breeders (coldwater)

AT the BRIGHTON & SOUTHERN AS AGM the proposal was passed that members of other societies will now be eligible to join as Associate Members for one-third the current membership fee. Associate members will have no voting powers and will not be able to enter table shows. Application for membership on this

basis must be endorsed by the secretary of the society of which the person is a full member. Brighton hope to gain lots of associate members, bringing better contact between societies with more people able to talk to one another on fishy subjects. Mid-Sussex AS have also introduced this at their AGM recently.

show on catfish. The table show for miniature aquarium, judged by Mr & Mrs Grieg, was won by Mr J. Mann (2, Mr B. Reed; 3, Mrs S. Carey). Fifty members of the society also attended the annual auction at which Mr G. Pryke acted as auctioneer. Judge at the table show for livebearers pairs awarded first and second places to Mrs M. Grieg (3, Miss H. French).

... MR Chatsfield of **BOURNEMOUTH AS** has won the annual points trophy; a very active member of the Society, Mr Chatsfield is a consistent exhibitor even though he has to travel from Wareham. Congratulations are recorded to Mr J. Jeffery, a committee member, who is now an 'A' Class judge for the FBAS. A talk given by Mr R. Matley, secretary, on show judging

provoked such intense interest that Mr B. Coombs, following on with the coldwater aspect, postponed his lecture for a month. Table show winners have been: playts (1, 2 & 3) Mr Chatsfield; swordtails, Mrs Bebb; av guppy, Mr Watkins; av danio, Mr Walker; av labyrinth, Mr Chatsfield; owner-bred pairs, livebearers, Mr Haskins; egg-layers, Mr Chatsfield.

... MR F. C. Tomkins, chairman of the FBAS and resident lecturer at Bethnal Green, presented the annual trophies to **BETHNAL GREEN AS** members. Points Cup, Mr S. Adams (2, Mr J. Connolly; 3, Trudy Hedges); Fish of the Month Cup, Mr S. Adams (2, Mr J. Connolly; 3, Mrs S. Hedges); Fish of the Year Cup, Mr J. Connolly; 2, Trudy Hedges; 3, Mr B. Martin;

First Year Members' Cup: Trudy Hedges; Wilkins Memorial Bowl, Mr J. Connolly (most points gained by member at Society's Open Show); Bethnal Green Institute Cup, Mrs S. Hedges (most points gained by member at all Open Shows).

... **PLANS for TORBAY AS** meetings (held at St Andrew's Methodist Church School Hall, Torridge Avenue, Shipway, Torquay at 8.00 p.m. on alternate Tuesdays) include a talk on coldwater fish breeding by Mr R. King on 9th April, a talk on general principles of fishkeeping by Mr R. Matley of Bournemouth AS on 21st May and an FBAS slide and tape show 'Non-U Goldfish' by Mr R. D. Esson on 4th June.

## Meetings and Changes of Officers

**ABINGDON AS.** Secretary, Mr G. Hall (16 Walnut Crescent, Littlemore, Oxford). Meetings: new times; alternate Fridays, 8.00 p.m. (5th, 19th April etc.), The Barley Way, West St Helen Street, Abingdon.

**BOREHAM WOOD & DAS.** Chairman/secretary, Mr R. F. Rumney; secretary, Mr A. Birch (40 Wansford Park, Boreham Wood, Herts. WD9 2PH; phone 01-953 6724); show secretary, Mr D. Hounsell. Meetings: 2nd and 4th Thursday of month, 8.00 p.m., Millam Hall Community Centre, Boreham Wood, Herts. All welcome.

**BURNEMOUTH AS.** Chairman, Mr W. Walker; treasurer, Mr R. L. James; secretary Mr K. Matley.

**BRIGHTON & SOUTHERN AS.** Chairman, Mr B. Rice; secretary, Mr S. Feek (55 Newmarket Road, Brighton, Sussex; phone 01273); treasurer, Mr M. Rooney; show secretary, Mrs B. Feek (55 Newmarket Road, Brighton, Sussex; phone 682037). Meetings: 1st Monday of month, 8.00 p.m., A. T. Social Club, Franklin Road, Hovegate.

**BRISTOL AS.** President, Mr S. Lloyd; vice-president, Mr G. Bell; treasurer, Mr W. Ryan; secretary, Mr H. C. B. Thomas; organiser, Miss H. Morgan; show secretary, Mr S. Rowden.

**BRISTOL TFC.** Chairman, Mr L. Littleton; vice-chairman, Mr B. Toozie; secretary, Mrs C. Littleton; treasurer, Mr B. Lawrence; show manager, Mr W. Holland; show secretary, Mr T. Cogland; club librarian, Mr J. Andrews; reporting secretary, Mr G. Fisher. Meetings: 3rd Thursday of month, Black Horse, Old Market, Bristol.

**BUXTON AS.** New. Meetings: fortnightly on Tuesdays, 7.30 p.m., the Wymsting Hotel, Buxton. Non-members welcome. Secretary: Mrs S. Parker (2 Abbey Street, Rhyd); phone 01629.

**COVENTRY P & AS.** Chairman, Mr A. Nash; secretary, Mr D. Easingwood (7 Cornhill Court, Coventry; phone 457555); minute secretary, Mr A. Simmons; treasurer, Mr F. Watts; editors, P. & C. Hinde; show secretary, Mr S. Woodbridge (32 Ridgeway Avenue, Coventry; phone Coventry 415352); P.R.O., Mr F. Hind; social secretary, Mr S. Paine; librarian, Mr K. Foster. Meetings: second Tuesday of month, 7.45 p.m., Biggin Hall Hotel, Barley Road, Coventry.

**CYMRU NATIONAL AQUARISTS' ASSOCIATION.** Chairman, Mr J. Edwards (Llantwit Major AS); vice-chairman, Mr G. Best (Swansea AS); secretary, Mr D. Richards (Rhondda AS) 3 Sherwood Street, Llywynypia, Rhondda; treasurer, Mr D. Richards (Rhondda AS).

**ELY & DAS.** Chairman, Mr S. Porter; secretary, Mrs L. Porter (54 Cambridge Road, Sireham, Ely, Cambs. CB6 3LR).

**FANCY GUPPY ASSOCIATION, BIRMINGHAM SECTION.** Chairman, Mr G. Steadman; vice-chairman, Mr S. Croft; secretary, Mr G. Beacham (35 Frankton Close, Matchborough, Redditch; phone Ryknild 4697); treasurer, Mrs J. Croft; show secretary, Mr D. Beacham; assistant, Mr M. Newitt; P.R.O., A. C. & I. Truman. Meetings: 4th Sunday afternoon of month, Glebe Farm Community Centre, Stochford, Birmingham.

**FANCY GUPPY ASSOCIATION, LANCASTER SECTION.** New venue. St Margaret's Church Hall, Tag Lane, Ingol, Preston. Meetings: third Sunday of month, 2.30 p.m. Secretary, Mr F. Lowe (39 Haworth Avenue, Rawtenstall, Rossendale, Lanex.).

**HUDDERSFIELD TFS.** Chairman, Mr J. Wike; vice-chairman, Mr S. Birley; secretary, Dr P. A. Lewis (27 Butternab Road, Huddersfield, HD4 7AR; phone 52022); treasurer, Mr D. Harrop; show secretary, Mr H. Ackroyd (51 Warrenside, Deighton); magazine editor, Mr N. Wheldon. Meetings: fortnightly, The Fraternity Hall, Huddersfield.

**KINGSTON & DAS.** Secretary: Mrs Jean Ellis (6 Buxton Crescent, North Chams, Sutton, Surrey; phone 01-644 0619).

**LEAMINGTON & DAS.** Chairman, Mr W. H. Gunthorpe; secretary, Mrs P. Stoodley (4 St John's Terrace, Tachbrook Street, Leamington Spa); treasurer, Mrs S. Chittenden; social secretary, Mrs M. Gunthorpe; show secretary, Mr G. R. Chamberlain (2a Stanley Court, Sydenham, Leamington); assistant, Mr T. Dobson; editor, Mr C. Chamberlain; librarian, Mrs B. Harris. Meetings: 1st and 3rd Tuesday of month, Trinity Hall, Trinity Street, Leamington Spa. **NEWPORT AS.** Secretary, Mr C. A. Short (6 Arthur Street, Caerleon, Newport, Mon. NP6 1R); phone Caerleon 420169; show secretary, Mr W. Gibbon (65 Dunstable Road, Newport, Mon.; phone 74103).

**NORTH KENT AS.** Chairman, Mr P. Cottle; secretary, Mr J. Parker (6 Moore Road, Swanscombe, Kent DA10 0DS); treasurer, Mr M. Hills; show secretary, Mr K. Saxby.

**PETERBOROUGH FISHKEEPERS ASSOCIATION.** Secretary, Mr C. A. Brakes (62 Wisbech Road, Thorney, Peterborough PE6 0SD). Meetings: Old Scarlett, Sycamore Avenue, Dogsthorpe, Peterborough.

**RHONDDA AS.** Chairman, Mr G. Mason; secretary, Mr D. Richards (3 Sherwood Street, Llywynypia, Rhondda); Minute secretary, Mr T. Clark; treasurer, Mr A. Cryor; show secretaries: Mr M. Williams & Mr E. Oakley; assistant, Mr G. Hartly. New venue: Ynyshir Hotel, Ynyshir, 1st and 3rd Wednesday of month, 7.30 p.m.

**SLOUGH & DAS.** Chairman, Mr K. Ferris; vice-chairman, Mr R. Winter; secretary, Edith Knight; treasurer, Mr B. Withers; show secretary, Mr R. Knight. Meetings: Friends Meeting House, Ragstone Road, Slough. New members welcome.

**SOUTH PARK AQUATIC (STUDY) SOCIETY.** Chairman, Mr G. E. Herring; secretary, Mrs M. Dudley (163 South Park Road, London SW19; phone 01-540 3662); treasurer, Mr R. Trim; show secretary, Mr D. Pearson. Meetings: 3rd Tuesday of month, 8.00 p.m., Wimbledon Community Centre, St Georges Road, Wimbledon. New members welcome.

**TROWBRIDGE & DA & PS.** Chairman, Mr M. Butcher; secretary, Mrs P. Pearce (69 Alfred Street, Westbury, Wilts.); treasurer, Mr H. Franklin; show secretary, Mr S. Huntley (49 Marsh Road, Hilperton, Trowbridge, Wilts.); press officer, Mrs S. Castle; newsletter editor, Mr G. Castle; trips organiser, Mrs R. Warren; librarian, Mrs M. Butcher. Meetings: 2nd Tuesday of month, 8.00 p.m., Rowing Club, Bradford-on-Avon.

**WALTHAMSTOW & DAS.** Chairman, Mr D. Goodbody; vice-chairman, Mr T. Twigg; treasurer, Mr B. Baulson; secretary, Mr G. Smith (22 Ardleigh Road, Walthamstow, London, E17; phone 01-527 6303); show secretary, Mr A. Chandler (233 Forest Road, Leytonstone, E17).

**WELWYN GARDEN CITY AS.** Meetings: 1st and 3rd Monday of month, 8.00 p.m., The Scout Hut, Great Dell, Welwyn Garden City. Further information: Mr M. Graham; phone Welwyn Garden City 31823.

**WEST CUMBERLAND AS.** Chairman, Mr S. Martin; treasurer, Mr R. Leckie; secretary, Mr B. H. Bray (2 St Pauls Avenue, Seaton, Workington, Cumberland; phone Workington 3225). Meetings: every 4th Tuesday, 7.30 p.m., Whitehaven Civic Hall.



## Dates for Your Diary

6th April, **THURBROCK** AS Open Show, Thorncliffe Junior School, Grays, Essex. Schedule: Mr A. Riddler, 2 Fern Place, Grays, Essex.

7th April, **SHEFFIELD & DAS** 14th Open Show, Granada College, Granada Road, Sheffield, 41 classes. Details: Mr H. Batten, 240 Marchmont Avenue, Manton, Sheffield; phone 92518.

14th April, **MID-KENT** AS Open Show, Medway & Maidstone College of Technology, Turpin Road, Maidstone, Kent. Details: Mr V. J. Roberts, 5 Ridgway, Maidstone, Kent.

14th April, **STOCKTON-ON-TEES** AS Open Show, St Peter and Paul School, Durham Road, Stockton (adjacent to Mill House Hotel). Details and schedule: Mr C. W. Back, 22 Dasher Grove, Thornaby, Teesside, TS17 8RN; phone Stockton 42264.

15th April (Sunday), **SOUTHAMPTON** AS Open Show, Avenue Hall Southampton. Details: Mr P. Brown, 213 Spring Road, Seotling, Southampton.

20th April, **SOUTH PARK AQUATIC (STUDY) SOCIETY** Inauguration Show, Woodhelen Community Centre, St Georges Road, London SW19. Free entry form available from Mrs M. Dudley, 163 South Park Road, London, SW19; phone 01-549 5662.

27th April, **BRISTOL TEC** Open Show, Congregational Church Hall, Stapleton Road, Bristol.

27th April, **RIVERSIDE** AS Open Show, St Saviours Church Hall, Cockfield Road, London W12. Details: Mr W. Nathaniel, 11 Greenwood Road, Fulham, London, S.W.6.

28th April, **BLAKEBOROUGH** AS Open Show, J. Blakeborough & Sons Limited, River Street, Race Point Lane, Blythwood, Yorks. Details: Mr T. Barker, 41-43 Curzon Street, Blythwood, Yorks. TD 6LJE.

28th April, **COVENTRY POOL & AQUARIUM SOCIETY** Open Show. Further details (a.c.c.) from Mr S. Woodhouse, 32 Ridgeway Avenue, Coventry, CV3 9BP.

28th April, **WARRINGTON** AS Open Show, Pitt Hall, Palmira Square, Warrington. Details: Mr J. Hagan, 42 Hood Lane, Rakey, Warrington, Lancs.; phone Warrington 30978.

3th May, **BOURNEMOUTH** AS Open Show, Kinross Community Centre, Millham Lane, Kinross, Bournemouth.

5th May, **OSRAM** AS Open Show, Recreation Rooms, Refuge Street, Shore, or Oldham Lane.

11th May, **PORT TALBOT** AS Open Show, YMCA Buildings, Port Talbot. Details: Mr A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, Glam. SA13 1AZ.

11th May, **SOUTHEND, LEIGH & DAS** Open Show, St Clements Hall, Leigh-on-Sea, Essex. Club and individual members, sponsors and marine classes. Schedule: Mr D. Howard, 172 Trinity Road, Southend-on-Sea, Essex; phone 610576.

12th May, **GLOUCESTER** AS Open Show, Education and Leisure Centre, Princess Road, Gloucester. Schedule (February): Mr B. Walker, 41 Harles Road, Gloucester.

17th May, **MERSEYSIDE** AS Open Show. Venue to be announced.

18th May, **TROWBRIDGE & DA & PS** Open Show, Nelson, Hadley Boys School, Trowbridge, Wilts. Schedule: Mr S. S. Haurley, 49 Marsh Road, Hilperton, Trowbridge, Wilts.

18th May, **BOSTON** AS Open Show, Blackfriars, Boston. Schedule: Mr D. J. Carter, 88 Towley Lane, Wrangle, Boston, Lincs.; phone 053 4264 227.

19th May, **YEOVIL & DAS** Open Show, School Hall, Merock, Somerset. Schedule:

Mr P. New, 3 Mayfield Road, Yeovil, Somerset; phone Yeovil 24225.

25th-28th May, **FANCY GUPPY ASSOCIATION** International Open Show, Glebe Farm Community Centre, Glebe Farm Road, Statchford, Buryingham, Dorset. Mr D. R. Baughan, 17 Peppers Close, Woodrow South, Riddish, Wexon (between a.a.c. plant).

25th-27th May, **MID-SUSSEX** AS Fish Exhibition, The Park Centre, Burgess Hill, Sussex. Setting up, 25th May. Open to public, 26th-27th May. A day out for the family - entertainment include the famous Crab Derby.

26th May, **BRIDLINGTON & DAS** first Open Show, Alexandra Hotel, Bridlington, E. Yorks. Details to follow.

26th May, **CORRY & DAS** Open Show, Corby Civic Centre. Details to follow.

27th May (Spring Bank Holiday), **EXHIBITION OF FISH AND REPTILES**, Kingsford Unit, Queen Elizabeth Road, Kingston, Surrey, 1.00-7.00 p.m.

30 June, **FRAS ASSEMBLY**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

1st June, **GMGR** General Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

2nd June, **BRITISH CICHLID ASSOCIATION** (Northern Area) Show for cichlids only. Further details to follow.

2nd June, **LOUGHBOROUGH & DAS** Open Show, Scholton, Mr L. Parry, 10 Cleveland Road, Loughborough, Leics. LE11 2NP (opposite Loughborough 07745).

2nd June, **SEBURY** AS Open Show, St Andrew's Hall, Seabury, Wootton Bassett, Middlesex. Details: Mr L. Brazier, 66 Grosvenor Way, Kenton, Middlesex (phone: 01-294 3374).

8th June, **LEANSWIT MAJOR** AS 21st Anniversary Open Show, The Town Hall, Leanswit Major. Superior celebration awards for all classes. Schedules: Mr J. J. Edwards, Glanville, Mill Park, Llanblethian, Cardiff, Glamorgan, CF7 7BG.

8th June, **HAVANT & DAS** 4th Open Show, St. George's Hall, Waterlooville, Hampshire. Schedule: Mr L. Parry, 10 Cleveland Road, Witley, or Portsmouth, Hants, PO1 5EW.

9th June, **GKN POND & AQUARIUM SOCIETY** Open Show. Details: Mr K. S. Hall, 58 Richard Street, Darlington, Staffs. WS10 9AL.

9th June, **BRIGHTON & SOUTHERN** AS Open Show & Fishkeeping Exhibition, St Barnabas Church, Hove, Sackville Road, Hove. Details: Mr S. Fack, 55 Newmarket Road, Brighton; phone 623013.

9th June, **MIDDLETON & DAS** Open Show, Holm High School, Holm Lane, Middleton. Details: Mr K. Smith, 49 Mayfield Street, Manchester M14. Please note: members of recognised aquatic society only may exhibit.

10th June, **BILLINGHAM** AS Open Show, Billingham Community Centre, Schedule later.

16th June, **SWILLINGTON** AS Open Show, John Smarson School, Barwick Road, Swillington, Leeds.

16th June, **SALISBURY & DAS** Open Show, The City Hall, Fisherton Street, Salisbury. Details to follow.

16th June, **BISHOP CLEEVE** AS Open Show. Details to follow.

23rd June, **ALFRETON & DAS** Open Show, Adult Education Centre, Alfreton Hall, Alfreton. Details: Mr B. Hickling, Parkview, 11 Coppice Drive, Eastwood, Nottingham; phone Laxley M63 5768.

23rd June, **SOUTH SHIELDS** AS Open Show, Bellinghams Hall. Details: Mr W. Scott, 89 Lincoln Road, South Shields, Co. Durham.

30th June, **HIGH WYCOMBE** AS Open Show, Lane End Hall, High Wycombe, Bucks. Details: Mr E. Leslie, 29 Meadow Walk, Tyler's Green, Bucks. HP10 8DG; phone Penn 4260.

30th June, **LINGDUN & DAS** Open Show. Venue to be announced. Details: Mr S. Hill, 14 Harley Street, Lincoln.

6th July, **BASINGSTOKE & DAS** Open Show, Carnival Hall, Basingstoke, Hants.

Details: Mr B. Rich, 95 Parliament Road, Basingstoke, Hants.

7th July, **GMGR** General Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

28th July, **ABBEBOROUGH & DAS** Open Show, Meriton Community Centre, May Street, Meriton. Details: Mr W. Carter, 27 New Street, Staines, or Barnes, W7 7EJ; phone Dadey 74600.

4th August, **TONBRIDGE & DAS** Open Show. Details: Mr J. T. Manton, 11 Northam Way, First Oak Green, Tonbridge, Kent.

10th August, **NEWPORT** AS Open Show, St John's Hall, Victoria Avenue, Meriton, Newport. Mon. Details: Mr W. Gribbin, 10 Dunstable Road, Newport, Mon. phone 74983.

11th August, **GRIMSBY & C.I.E.E.** THORPES AS 3rd Open Show, Matrona Hall, Clouthorpe, Scunthorpe later.

11th August, **BIDWORTH AQUARIUM & POOL SOCIETY** Open Show, Scunthorpe Chamberhouse School, Biddings Lane, Bidwirth, Scunthorpe. Mr J. Salter, 20 Gaisley Street, Noreham.

18th August, **STROUD & DAS** Open Show, Second Suburban Room, Details: Mrs D. Cole, Avonlea, The Hill, Bampton, Stroud, Glos.

18th August, **HUDDERSFIELD** 7th Open Show, Padlock Youth Centre, Broom Street, Huddersfield. Details: Mr H. Aspin, 51 Warrayside, Drighton, phone Huddersfield 37997.

20th August, **CASTLEFORD** AS Open Show, Castleford Civic Centre.

21st August, **WINTON-SUPER-MARE & D.T.C.** Open Show, St John's House, Colton Street, Winton-super-Mare.

3rd September, **BETHNAL GREEN** AS Open Show, The Institute, 229 Bethnal Green Road, London E2. Schedules: Mrs A. Hodges, 3rd Korner, 150 Archbishop Avenue, Ilford; or Waltham Cross, Waltham Cross, Essex.

10 September, **PETERLEE & DAS** Open Show, Schedules: Mr Bellingham, 49 Marlborough Road, Hastings Hill, Sandhurst, Co. Durham.

7th September, **FRAS ASSEMBLY**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

8th September, **BRACKNELL DUCOT & READING** AS Combined Open Show, Students Union, Reading University, Details: Mr J. Horsey, 4 Rickmans Chase, Woodley, Reading, Berks. RG5 311; phone Reading 66912.

8th September, **HARLOW** AS Open Show, Mood Hall, The Stow, Harlow.

8th September, **SLUGH & DAS** Inauguration Show, The Rotunda Club.

22nd September, **TORRAY** AS Open Show, Torquay Town Hall.

29th September, **HUCKNALL & BULLWELL** AS Open Show. Details to follow.

5th October, **EAST LONDON A & F** Open Show, Ripple Road School, Ripple Road, Barking, Essex. Details: Mrs J. Arroy, 48 Church Street, Dagenham, Essex.

25th-27th October, **THE AQUARIUM SHOW '74** at the Royal Horticultural Society's Old Hall, Vincent Square, London S.W.1. Presented by the Federation of British Aquatic Societies. Aquarist society fishkeeping exhibits invited. Details from the Organiser, c/o 354 Garratt Lane, London SW17 0NY (01-847 2605).

27th October, **DONCASTER & DAS** Open Show, Woodhouse's Miners Welfare, Welfare Road, Woodhouse.

2nd November, **GMGR** General Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

10th November, **HALIFAX** AS Open Show, The Furze Cottage Community Centre, Crown Lane, Bingley, Halifax. Details: Mr D. Skidelski, Collyerstone, Garside, King Cross, Halifax; phone Halifax 60116.

10th November, **WALTHAMSTON & DAS** Open Show. Details to follow.

1st December, **BIRSPORTH** AS Open Show. Details to follow.

7th December, **FRAS ASSEMBLY**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

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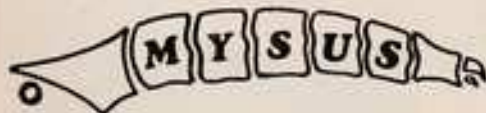
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