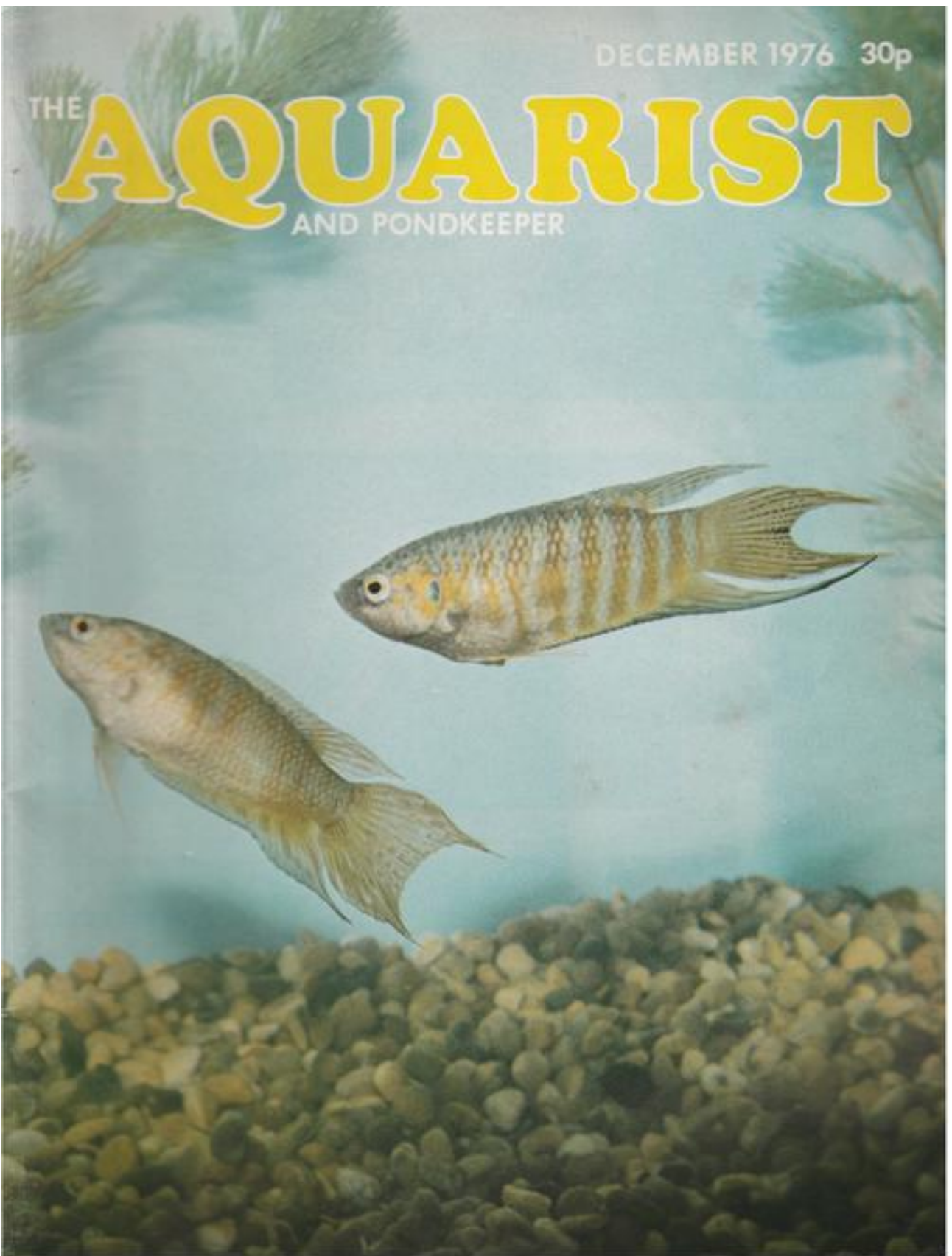


DECEMBER 1976 30p

THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

Published Monthly 30p

Contents

Printed by Buckley Press,
The Butts, Half Acre,
Brentford, Middlesex.
Telephone: 01-568 8441

Subscription Rates:
The Aquarist will be sent post
free for one year to any address
for £5.30. Half-yearly £2.65.

MSS, or prints unaccompanied
by a stamped addressed
envelope cannot be returned
and no responsibility is accepted
for contributions submitted.

Founded 1924
as "The Amateur Aquarist"
Vol. XLI No. 9, 1976

Editor: Laurence E. Perkins
Advertisement Manager:
J. E. Young

Our Cover: Paradise Fish
(*Macropodus opercularis*)

December, 1976

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THE PARADISE FISH



Written & illustrated by Jack Hems

THE Germans, we do not have to remind the well-informed, were the pioneers of the tropical fishkeeping hobby. Yet in all probability it was two Frenchmen who started the whole thing off. For in 1868 M. Simon, the French Consul at Ningpo, brought back from China some fish known round about that time as *Polyacanthus viridis-auratus* but now described for science as *Macropodus opercularis*, and presented them to M. Pierre Carbonnier, who resided in Paris and took a great interest in goldfish. A year later M. Carbonnier witnessed the fascinating spawning procedure of this brilliantly garbed species and gave it the popular name of paradise fish. He raised a goodly number of fry and passed some on to Francis T. Buckland (1826-1880), a most extraordinary character and one of the most knowledgeable and inquiring naturalists this country has ever produced. Before the 1870s were out, the fish had become established in the tanks of aquarists in Europe and in America.

M. opercularis is a member of the family Anabantidae. Anabantids are characterised by the presence of a labyrinth-like accessory respiratory organ on each side of the head. This enables them to breathe atmospheric air, which they normally do at irregular intervals at comfortable room temperature and more frequently indeed when pollution or a high temperature has robbed the water of oxygen. For it must always be remembered that anabantids also make use of their gills in the normal way of fishes.

M. opercularis is able to stand a wide range of temperature. In short, from the lower fifties to the nineties (°F). Yet neither end of the scale will be tolerated for protracted periods. An abrupt change of temperature can produce serious trouble. It is necessary, therefore, to condition paradise fish to any change of temperature very gradually. The beginner,

then is warned against introducing a pair of paradise fish into an unheated aquarium if they have been kept in a dealer's stock tank at a regular tropical temperature. A slow fall extending over several days is absolutely necessary. However, once conditioned to sitting room temperature paradise fish will live well and even breed (during warm summer months) without extra heat.

M. opercularis reaches a length of about 3 in. In the male the caudal, dorsal and anal fins are very produced. Unfortunately, decades of domestication have resulted in a marked deterioration in the size, finnage, and coloration of many paradise fish which come onto the market. This deterioration has been brought about, I suspect, by too much inbreeding and a certain amount of cross-breeding with the albino paradise fish—a colour variety developed in Germany in the early 1930s. Be all this as it may, flowing finned and brightly coloured paradise fish do turn up every now and again in dealers' establishments.

In a well-coloured male, the upper part of the body is greenish brown to muddy grey. The top of the head and the anterior part of the back are mottled and spotted with black. Nine or more alternating red and blue metallic bars adorn the sides. The gill-cover is marked with a blue-green blotch margined with orange or coppery gold. There is a lot of metallic green, blue and red on and around the head. The pelvic fins are long, blue in the base and melting into red, white or pale blue needle-like tips. The pectoral fins are clear. The caudal, dorsal and anal fins are plushy red dotted and marked with blue, blue-white and brown. They terminate in feathery filaments. The female is fuller in the body than the male and her fins are noticeably shorter. Ordinarily her colours look rather washed out, at least until she is on the point of breeding when her blue tints become more

intense. The blue bars on a sexually aroused male become darker and the red bars more vividly red.

Feeding the paradise fish is no problem because it is always ready to accept dried food, lean meat, chopped or small earthworms, houseflies dashed onto the surface of the water (from which they are pulled down and eaten before they can recover from the shock), gnat larvae, wood-lice, planarian worms, water snails and so on and so on. In disposition *M. opercularis*, especially the male, cannot be called ideally suited to a community tank. It never, or hardly ever, fails to have a go at much smaller fishes and fishes with voluminous fins such as bettas come in for much unwelcome attention. However, some paradise fish are less inclined to misbehave themselves than others. If paradise fish are placed in a community tank to give it more interest and colour, then the sensible thing to do is to see that other fishes present are sturdily built and not easily intimidated or driven away from food. Furthermore, thickets of plants should be provided to afford plenty of escape routes for chased fishes.

Basic breeding requirements are a tank holding at least seven gallons of matured water, some plants left floating or which grow floating, and a temperature—raised after the fish have been introduced—a few degrees above normal. A temperature of 72°F (22°C) to 75°F (24°C) is suitable. The higher, within reason, the better. Just before and after placing the fish in the tank they should be fed to repletion on live food and meat. Separation of the sexes for a week or two is advised. A sheet of clear glass wedged across the middle of the tank will keep them apart. At the same time it will not inhibit the aphrodisiacal effect of their being able to see each other. Almost always the libidinous male will respond to this treatment by enhancing his colours and displaying like a peacock. As a rule, the female hardly ever fails to be intrigued by this display, and soon develops egg-bloated sides. Immediately the fish betray unmistakable signs of sexual excitement remove the glass partition.

Under a bright light, the male dons even more brilliant colours and, in between spreading his fins and cutting capers, blows bubbles at the surface. Invariably he blows them near or among floating plants. The enormous number of bubbles he blows results in a raised dome of sud-like froth. Sometimes the male has to blow several domes of froth or spreading patches of froth before the female condescends to play her part. When she is pleased with the set up and is sufficiently aroused spawning begins. The male swims excitedly about until the female indicates in no uncertain way that she is eager and waiting for the coupling act. She swims under the nest. She sways her body from side to side invitingly. The male takes the hint and wraps his body round her's in a circle—head touching tail—and, with much

trembling, the pair sink in the water. As they sink the female is turned on her side or back and, with the male tightening his embrace, she releases a score or more of buoyant eggs. After a momentary pause, the fish break apart. Now their duty is to see that any eggs floating in the wrong direction end up in the nest. This they accomplish by gathering them in their mouths and blowing them into the nest. The female extrudes eggs several times over a period of an hour or more before she is spawned out. Now the male divides his time between driving the female away from the spawning site and keeping the nest in good repair. If the aquarium is adequately planted, the female may be left with the male. If, however, there is not much green cover, it is best to remove her to another tank, without disturbing the nest, of course, to prevent her being badly treated.

In a temperature of about 75°F (24°C), incubation of the eggs is completed in two or three days. The hatched fry remain for the first few days of their lives in the nest. By this time it is breaking up. If the odd youngster starts to spiral away from the rest of the brood, the male catches it in his mouth and returns it to the nest. It is not unheard of for a watchful female to collect straying babies in her mouth and then spit them out in the direction of the male. Without waste of time, he makes certain that they join their wriggling brothers and sisters.

Before a week is out, the fry are free-swimming. To live and grow they require microscopic food such as infusorians or a suitable substitute for minute live food. Flour-fine dried food will do. The aquarium must be kept properly covered to keep warm air in and cool air out. Also, the surface of the water must be kept free of scum. This is easy to achieve by drawing torn sheets of newspaper across the surface every day if necessary. Scum is dangerous not so much in itself, but because the young fish are prevented from taking gulps of air when their labyrinth organ develops. In a word, they are not strong enough to break through the oily or greasy barrier. Until the labyrinth organ develops, they draw the oxygen they need from the water. Thus an air pump can be a great fry saver, that is during the first month or so. Furthermore, regular siphoning of the bottom will help to keep the water wholesome and prevent pollution.

In the main, paradise fish make good parents. However, if the tank is on the small side it is a good plan to separate the youngsters from their parents about a month after they have hatched out. This will rule out the possibility of the fry being bullied or robbed of their food.

M. opercularis is a long-lived species and a life-span of upwards of seven years is not uncommon. The albino form is slightly more docile and seemingly less hardy than the type.

B.A.F. FESTIVAL, 1976 SILVER JUBILEE

by Arthur Boarder

THE EXHIBITION was held on 23rd and 24th October, and as usual attracted thousands of visitors. The show seems to go from strength to strength and whereas the first one took place in a small portion of the hall, the present one took up the whole of the hall, which is over eight hundred feet long. Even the two buffets were pushed out to an adjoining bay. It seems incredible that twenty-five years have passed since I attended the first exhibition. One thing which helped to bring home to me this fact was that some of the young girls who sold programmes at that show were at this one, now married with teenage children.

Many of the societies' stands were of the usual high standard. Some had used a rather formal type of design but several had shown exceptional skill in providing a spectacular display to interest the many non-aquarists who attended. The first prize went to Southport A.S. for a celebration cake, very well executed and which must have taken considerable work to complete. The second prize went to Thorne A.S., for a splendid replica of a fireplace. The third place was awarded to Osram A.S. for a tableau of a 'Pop Group,' complete with three performers and guitars. Several of the other displays were very good indeed and not complying exactly with the rules may have meant disqualification. A splendid model of a

Diesel engine was so well constructed that no one, not even a steward, was able to enter the exhibit in order to check wiring in case of a breakdown. A very good exhibit was a gipsy caravan, very well constructed to the last detail, but again here, not complying with the rules of sizes of tanks, and the fact that one large tank was leaking badly, put this display out of the running.

The Isle of Wight had a very fine boat, very well constructed, but it appeared odd to have a tank standing on the side of the deck, both fore and aft. Castleford A.S. exhibited a fine Hovercraft and Chesterfield an Art Gallery. Lanarkshire A.S. had a model of a fishmonger's horse and cart and carrying the name 'Tammy Troot,' with baskets of fishes for sale. The Basingstoke A.S. exhibit was in the form of an Airship. Hyde A.S. displayed a man 'In the Dog House,' very well done, and emphasising the fate of many aquarists. Many of the societies had gone to great trouble to help to make the show such a success that it is a pity that more winners were not possible.

The Champion of Champion class made an attractive display and the first prize went to Mr. & Mrs. K. Blades of Bassetlaw A.S. with a Pumpkinseed Sun Bass, (*Lepomis gibbosus*), a fish which looked like one would expect a healthy Sun fish to be. The second

Continued on page 341



First Award, Southport Aquarist Society



Fourth Award, Castleford Aquarist Society



Top: Third Award, Osrarn Aquarist Society
 Centre: Mr. George Cooke presenting trophy for best
 Fish in Show to A. Blake
 Bottom: Mr. George Cooke presenting First Award for
 Southport's Tableau

Top: Second Award, Thorne Aquarist Society
 Centre: Presentation of Award to Champion of Champions
 Winner
 Bottom: Mr. J. Butler receiving his Presentation

THE BULLFROG FROM S.A.

Written & Illustrated by Christopher Mattison

THE South African Bullfrog, *Pyxicephalus adspersus*, occurs in tropical Africa as far south as South West Africa, Orange Free State, Transvaal, Natal, and Eastern Cape Province. In this part of the world the seasons are divided into wet and dry, and during the latter these frogs burrow into the soil and aestivate until the advent of the rains. As an aid to conserving moisture during this stage of its life the bullfrog forms a thin membrane over its entire body including the

bullfrog is peculiar in that it shows a high degree of parental care. Many observers have noted that an adult is often to be found in or around the pools where young are developing, and it would appear that in every case this individual will be a male. The paternal instinct can be so powerful that he will sometimes attack and bite a human hand placed in the water. The froglets leave the water as soon as their tails are absorbed, at which time they measure only a



eyes, and this can sometimes be seen in the case of captive specimens whose quarters have become too dry.

The beginning of the rainy season is the cue for the frogs to reappear from their subterranean retreats, often in large numbers, and commence breeding in pools and shallow lakes and it is at this time that the male bullfrog provides the reason for its common name by emitting his bellowing call.

Although the development of the spawn, through to the tadpole stage and eventual metamorphosis, follows the usual pattern of the frog and toad family, the

fraction of the adult size and are prettily marked with lime-green and yellow streaks and blotches on a grass green background. Feeding commences immediately on insects, grubs etc., and even on each other, and growth is very rapid. The juvenile markings gradually disappear and the adult colouration replaces them. This consists of a dark green back and yellow underparts, relieved by a splash of orange at the base of the forearms.

As the animals grow, so their appetites and the size of their meals keep pace, until when they are adults measuring possibly nine inches in length and three

inches across the head, they appear to feed mainly on smaller frogs and toads, rodents, lizards and young snakes. As an example of the latter, a specimen dissected in a South African museum contained thirteen, entire, newly-born Rinkals cobras in its stomach as well as the head and part of the body of a fourteenth.

In captivity they are no less voracious and will accept fully grown mice, taking several in one meal. If put in live the mice will be chased and caught in a quick lunge forward, and then held in the powerful jaws and crushed. However, captive specimens can easily be taught to take previously killed mice or even strips of meat sprinkled with vitamin powder if the items are jiggled slightly with a piece of wire. Needless to say, smaller frogs, toads etc., must not be housed with bullfrogs.

Accommodating one or two bullfrogs is no problem as they are not very active animals, nor is a dish of water a necessity provided that the substrate is kept reasonably damp by spraying. Owing to their bulk and their clumsy burrowing movements, an attempt at planting out the vivarium is usually doomed to failure except, possibly, with very young specimens, and the most practical arrangement in my experience is a

deep (six inches or so) layer of sphagnum moss covering a thin layer of granulated peat in a plastic or glass aquarium. A rock, pieces of bark, logs etc., will give additional cover and although the inmates will spend much of their time hidden from view, this is a natural and altogether more satisfactory arrangement than one in which the frogs feel exposed and insecure. They quickly learn where their food comes from, and can be relied upon to emerge from their retreats when hungry.

It is doubtful if breeding can be achieved in captivity, in this country at least, owing to the large size of the adults and the difficulties in providing the suitable climatic cues which stimulate breeding activity, but they live a long time with comparatively little attention and are extremely fascinating creatures to anyone interested in keeping something a little out of the ordinary. Two examples in my collection have been in captivity at least six years and were both fully grown when imported. They receive no supplementary heating in the summer and a small light bulb warms them for part of each day in the winter. Their menu comprises one mouse each per week, and neither has been troubled with disease or injury—neither have they directed any or their anurian aggression towards me.

B.A.F. SILVER JUBILEE continued from page 338

prize went to S. Wolstenholme of Heywood A.S. with a tropical, an *Aulonocara Malawi* Cichlid, and the third to a *Cichlasoma citrinellum*, owned by G. Bond, of Southport A.S.

There were the usual excellent tropicals on display and it appeared that the Cichlids are becoming very popular nowadays. As is usually found at such exhibitions, the larger fishes attracted more attention from the general visitor.

The Marine fishes were not very numerous and do not appear to have brought in many tanks; I expect that it is no easy task to transport and bench such fishes.

The coldwater fishes were again of a good standard and some very fine common goldfish were to be seen. These fish are usually to the fore at Belle Vue. A fish which caught my eye was the winning Lionhead, one of the best specimens I have seen. If my memory serves me right, this fish was awarded eighty points and I am still trying to work out where it could have lost twenty points. There was a fine Bubble-eye with two of the best bubbles I have seen and a tank of Shubunkins in the breeders class was also eye-catching.

The Koi were not left out by any means. The British Koi Keepers Society had a fine pond, 21 feet by 7 feet with about sixty fine Koi showing many

variations in colour. This exhibit attracted a lot of attention. There was also a fine display of Killifish by the Society where enthusiasts of this fish could view varied types.

There were over two dozen trade exhibits and their stands were besieged by hundreds of buyers for most of the time. On the "Aquarist & Pondkeeper" stand were the Editor, Laurie Perkins, Jack Hems and myself to give any advice needed. The many trophies and cups on display on this stand made an impressive array and the prize-giving was extended over a long period. At the commencement of this event, a very pleasing ceremony was performed by Mr. G. W. Cooke who presented Mr. J. Butler with a "Parker" silver pen and pencil, as a token of appreciation for all the work he has done over the years. It was Mr. J. Butler of the "Aquarist & Pondkeeper" who first thought of the idea of putting on a large show at Belle Vue. He was the prime organiser at all the earlier shows and has continued to this day to contribute so much to the success of the exhibition.

I am sure that all members of the organizing society, The Federation of Northern Aquarium Societies who assisted in any way to make the show such a success, must be congratulated on their efforts.

A full list of prize winners is published on another page.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A., A.C.P.

Photographs by the Author



BEST WISHES for an enjoyable Christmas and a peaceful and prosperous New Year. My thanks to the many people who wrote to me during 1976: your letters were much appreciated. I look forward to receiving a variety of interesting letters in 1977.

In recent editions a number of readers stated that they found the scientific names of fishes difficult to pronounce, identify and remember. Such readers, like me, will be delighted with a new publication produced as a result of collaboration between the F.B.A.S. and one of its member societies—Tonbridge Aquarist Society. Entitled *A Dictionary of Proper and Common Names of Freshwater Fishes* (F.B.A.S. National Booklet No. 9) this 110 page publication should prove an ideal reference booklet for those occasions when one wants to look up the proper name of a fish one knows only by a common name; or vice versa. Obviously such a publication cannot cover all freshwater fishes—but it lists most of those most of us are likely to see in dealers' shops, at aquarium shows, etc. The Dictionary gives some help with pronunciation of proper names; and with the meanings of trivial (specific) names. Beside each fish's name is given the F.B.A.S. Show Class letter for the species in question. The first section of the book lists fishes in appropriate groups, e.g. Barbs, Tetras, Cichlids, Dwarf Cichlids, Killifishes, Catfishes, Livebearers; the second section lists common names in alphabetical order together with proper names. Where a common name has not yet evolved for a given species a space has been left in the text so that one can, at a later date, add any common name that may evolve. I checked up on a few of my favourite fishes—including the popular 'krib', still better known as *Pelmatochromis kribensis*. The Dictionary supplied its current correct name, *Pelvicachromis pulcher*, together with its common names 'Kribensis; Medium Rainbow Cichlid'. Both Tonbridge & District Aquarist Society and the F.B.A.S. are to be congratulated on producing such a useful little reference booklet. A lot of research must have gone into its production and the end product deserves a place on the bookshelf of every aquarist. Copies cost £1.00 each and may be obtained from the F.B.A.S. Publications Secretary—Mrs. Sybil Hedges, of 150 Ashbenton Road, Seven Kings, Ilford, Essex.

My thanks to Mr. Dick Mills of the F.B.A.S. for sending me a copy and for providing me with inform-

ation about the Federation's other activities. Readers may be interested in the Federation's Booklet No. 8, *Characins*, co-produced by the F.B.A.S. and the Characin Study Society. Mr. Mills told me: "... As its (the Booklet's) name suggests it deals exclusively with some two dozen species from the *Characoidae* family, ranging from the diminutive phago to the fearsome piranha." This publication costs 45p and copies may be obtained from Mrs. Hedges.

From this month (December) two new AquaTalks will be available; they will be entitled 'History of Fishes through Fossils', by Susan Turner of the Hancock Museum, Newcastle; and 'Non-African Cichlids', by Ian Sellick of the British Cichlid Association. Bookings may be made by contacting Mr. K. Saxby, at 5 Rowan Close, Meopham, Nr. Gravesend, Kent.

Mr. & Mrs. D. D. Sands reside at 25 Ellerbeck Road, Cleveleys, Nr. Blackpool. Mr. Sands' letter reads: "I read with mutual interest Jennifer Baker's article on the antics and the eventual sad demise of her weather fish. I have two 4 in. weather loaches in my 36 in. x 12 in. x 15 in. tropical community tank, and one 5 in. 'old motley codger' in my 24 in. x 12 in. x 12 in. catfish aquarium. Keeping these cheeky fish in a tank is surely comparable to the futile attempts of the Germans to hold POWs in Colditz. The first two have both travelled across our lounge carpet. One scared my wife to screams one dark, early morning by wriggling around her bare feet. They all climb out where air lines lead in—so we have since plugged all open holes with cotton rags. Even so, one of a pair of spiny ells purchased last week still managed to escape; only to meet with a sad, sticky end. Perhaps we should place our tanks under lock and key! Our main interest is in *Corydoras*. We have seven pairs and five single characters of these lively, ever-winking fish: *C. arcuatus* (skunk catfish), *C. agassizii* (Agassiz's catfish; network catfish), pairs of *C. julii* (leopard *Corydoras*), *C. elegans* (elegant catfish), *C. rabauti* (dwarf *Corydoras*; Rabaut's *Corydoras*), *C. bondi bondi* (striped catfish) and *C. punctatus* (spotted catfish), to mention but a few." (The information in brackets I obtained from the new F.B.A.S. Dictionary; I included it to show how useful the publication is B.W.).

Mr. Sands continues: "I would be extremely grateful

for any correspondence from other *Corydoras* collectors and any ideas on housing these fish. They move across our community tank in a pack—very cautiously. Any ideas on variation for feeding? Fellow aquarists, please do not hesitate to write to me. Please, more articles on *Corydoras* in *The Aquarist and Pondkeeper*."

Photograph 1 is of a plump little *Corydoras*. Please send me details of your experiences with the breeding of any *Corydoras* species. Photograph 2 shows a female dwarf gourami, *Colisa lalia*, and Photograph 3 a honey gourami, *Colisa chuna*. Although female dwarf gouramies usually show little colour, I've noticed of late that fishes of some species on sale in shops seem to have much duller colours than was the case several years ago. I've noticed this current lack of colour particularly in such species as kribbs, dwarf

practicality of this method as I have not had to use it so far. One word of warning: remember the water. My friend heard of someone who tried this method on a 12 in. red Oscar—without the water!

"My most prized fish at the moment are four 2½-3 in. *Geophagus jurupari* (earth eater; devil fish). I managed to obtain them from the local pet shop. They were relatively cheap—60p at 1½-2 in. They are housed with four blue acaras and two angels in a large aquarium. I find this combination provides an interesting and peaceful cichlid community. I did at one stage have four 1½ in. convicts which played hell with the other fish and were ejected swiftly when bits of fin and tail started disappearing. My only reason for buying them was the memory of an albino convict I had once which was very peaceful and never touched



gouramies and honey gouramies. Many of the kribbs I've seen recently have had few or no coloured dots on any of their fins. Have any other readers noticed these deteriorations of colours in particular species? If so, to what do you attribute this change for the worse?

Mr. Alan Spence's home is at 'Quoyawa', Huna, Wick, Caithness. He writes: "I wish to pass on a tip I got from a German aquarist. I was telling her of the various methods suggested by readers for the disposal of sick or problem fish; most of them she found rather inhumane, if not horrifying. She explained that her method was to place the fish in a plastic bag containing water from the aquarium—in the same way as one gets fish from a shop. The bag plus contents is then put in a deep freeze or the freezing compartment of a refrigerator. In the darkness the fish is not alarmed and assumes a state of rest. As the water cools the metabolic rate of the fish decreases slowly until the fish dies. I think that theoretically this is the best method I have heard of so far. I cannot comment on the

other fish. Has any other reader found such marked differences between normal and albino forms of the same fish? The main diet of my stock at the moment is earthworms. I would like to add a bit of variation and as there appears to be no supply of *Daphnia* or *Tubifex* north of Inverness, I was thinking of using locusts. I remember reading an article in *The Aquarist* about the use of locusts as live food and wonder if any of your readers use them and, if so, how do they rate them?

"One of the things that amazes and annoys me about our hobby is the way in which a certain well-known (foreign) company can sell a white spot cure which to my mind is very inefficient, at a (high) price, while a British company sells a far more efficient white spot cure at less than a twentieth of the cost. I can only assume that hobbyists don't bother to find out what they're paying for; or simply believe that the most expensive product is the best—which in this case I simply do not agree with. One final point: in your October column Miss Hatton mentioned that her

gourami fry always seemed to die in their fourth week. I think that this might be the effect of cold draughts on the surface of the aquarium water when the fry develop and start using their labyrinth organ. Perhaps someone with a better knowledge of *Anabantidae* might care to comment on this." (One point about 'cures' manufactured by British companies: very few state what their 'cures' contain; hence one is totally in the dark about what mixtures contain other than easily identifiable coloured dyes. If one brand of 'cure' fails to effect a cure one is left in a position of not knowing whether a different brand contains the same or different chemicals in the same or different proportions. I once mentioned this point to a couple of manufacturers and was told that competitors could copy such products if the contents were made public; however, German and American 'cures' usually have a list of contents printed on the carton or container.

a Philips 30 watt white tube for four hours in the evening. The U/G filter was placed on the bottom of the tank and covered with approximately 1½ in. of gravel. Over this was placed a thin sheet of G.R.P.—fibreglass—which covered the entire base area of the tank apart from ½ in. along the front of the tank. Silicone rubber sealant was run around the three sides of the tank where it was abutted by the sheet of G.R.P. and where the air lifts penetrated the G.P.P. sheet. A mixture of peat and clay was used as substrate laid on the G.R.P. and covered with gravel terraced to 3½ in. above the G.R.P. sheet at the rear, sloping to about 1½ in. at the front. To hold the ballast in its terrace I used 'rocks' made of rigid urethane foam of the type sold for insulation purposes. This is a very dark brown, almost black colour, and sawn into strips which run the full length of the tank; the strips were worked with sandpaper into a rock-like



What cure or treatment would you prescribe for velvet disease?).

It was pointed out to me recently that brine shrimp eggs obtained from some sources give better hatchings than do those from others. I'd be pleased to hear from you if you've any experiences to pass on to other readers.

No. 38 Phelps Way, Hayes, Middlesex, is the home address of Mr. Nicholas Creenan. He has the following to say: "In the past I experienced poor plant growth in tanks fitted with U/G filtration and concluded—as have many other aquarists—that the unnatural flow of water around the roots of the plants inhibited their growth. In April 1975 I adapted the system I will describe which allows full U/G filtration without the water flow around plants' roots. The tank used for the experiment was a 39 in. × 15 in. × 12 in. all-glass one; lighting was by a 30 watt Toshiba aquarium tube for 11 hours per day, supplemented by

profile and they produce an effect which is most convincing. The material looks exactly like sandstone; in fact no one has ever guessed until told that it is not natural rock. The foam of course has to be weighted to hold it down. I cut slits in the bottom into which I slid pieces of roofing slate; the weight of the gravel on the slates does the rest. However, I digress from the main topic of my letter which is the filtration system.

"The filter can only suck the water from the area between the front 'rock' and the glass, thus leaving the rest of the gravel bed free for the cultivation of plants free from the water flow problems previously mentioned. The results I have obtained using this system have been excellent: gin clear water at all times and excellent plant growth. I give plants away now instead of buying them! I still have no success, though, with *Cobomba*, although other local aquarists of my acquaintance have the same problem whether or

not they use filtration; perhaps it is the local tap water.

"The turn-over rate of the filter has been varied during the course of the experiment from slow to flat out, and for a period the filter was run only during the lights-out phase. None of these variations affected the plants in any way. I think perhaps a side benefit of the system is that the warm water circulating beneath the G.R.P. plate warms the roots of the plants by conduction and this also stimulates their growth. No real attempt has been made to grow plants in the area between the front glass and the first 'rock' as even if they would grow there—which I doubt as in front it is subjected to very high flow rates—they would impede cleaning algae from the front glass, for which purpose I use one of the plastic pan scourers which are much less likely to mark the glass than razor blades. I hope you will find my letter interesting and perhaps be tempted to try the system out for yourself.



"The plants grown successfully include *Vallisneria*, wisteria, *Hygrophila*, dwarf lily, *Samolus*, Java fern, various *Cryptocoryne* species, Amazon sword, floating fern, *Ludwigia* and, yes, willow moss. The tank is in a centrally heated room and its temperature fluctuates between 24-27°C. The fish in the tank are 2 large angels, 2 red tailed black sharks, 8 tiger barbs, 6 zebra danios, 2 glass catfish and one *Corydoras*. One thing crosses my mind: marine aquarists do not seem to make very much use of your columns. I wonder why? Surely your article is a clearing house for ideas, and marine fishkeeping must pose as many if not more problems and topics for discussion as does freshwater fishkeeping. I am prompted to ask this question as I have recently completed a 110 gallon G.R.P. tank for marines, but am still uncertain as to which system to adopt. The semi-natural system is cheap in initial outlay, but with the expense of marine animals—not to mention their well-being—are better results, i.e.

longevity, attained by natural or sterile system exponents? It may well be that even with the higher initial outlay and higher running costs of a sterile system it will still be more cost-effective than a semi-natural system. I don't know. It would certainly be interesting to hear from persons experienced in these matters and form one's own opinions. Thank you for a most interesting and informative column and, indeed, for the best fishkeeping magazine anywhere. Keep it up!" (I'm always delighted to include marine queries sent to me for discussion in this feature. Unfortunately I receive very few—and never having kept tropical marines myself I don't know much about the problems marine aquarists would like to have discussed in these columns. If you're a marine aquarist and would like to have a specific topic discussed, please send me details. I presume those who keep marines are still a relatively small minority of the

total population of aquarists in the U.K.)

My thanks to Mr. Alan Lee, of 10 Loral Park, Newtownabbey, for sending me some coloured photographs of his attractive pond—complete with fountain. Unfortunately coloured prints are unsuitable for publication in this feature. Alan has recently set up a 48 in. × 15 in. × 18 in. aquarium housing African knife fish and other tropicals. No doubt he'll let us know how he progresses with the named species.

Readers are reminded that although I enjoy receiving letters and writing replies, I have very little free time to reply to individual queries. Those sending photographs should write names and addresses on the reverse and enclose a s.a.e. for the return of the prints. Manufacturers wishing to have new products reviewed should send them to Mr. John Young, our Advertising Manager, and not to my home. Readers are reminded that I accept no responsibility for the views expressed by contributors to this feature, nor do I

necessarily agree with the opinions expressed by contributors. Please remember to PRINT your name and address on letters to this feature: it helps to make my job a little easier and helps to prevent errors.

The following is part of a letter I received from Mr. Laurence Sandfield, who lives at 25 Leighton Road, London, W.13. I hope to be able to include the remainder of Mr. Sandfield's letter in a future edition. He writes: "... Although not a showman myself I just cannot understand Mr. B. L. Richards' attitude to show tableaux. Surely the point is to give the general public, who pay to come in, something to catch and, if possible, hold their interest, in a way which rows of tanks containing fishes which may very well look all alike to them cannot. This cannot be a bad thing. My personal attitude to tableaux—and trade stands—is that they make the show for me; and people who gripe at them must be narrow minded." (This is the first letter I've received supporting tableaux displays at shows. What is your opinion? Although I enjoy trade stands I'd prefer realistic, i.e. as one might find in an average home, settings for decorative aquaria rather than giant models of aeroplanes, etc.).

I was interested to learn that the mention given to the Fancy Guppy Association in the October *W.Y.O.* brought the Association a response from five probable new members in the first fourteen days of the month. My thanks to Mr. Jeff Hutchings for letting me know. The Association's Overseas Secretary, Mr. Bob Purdy, of 30 Church Street, Ebbw Vale, Gwent, asks for some help for members in South Wales. He writes: "We would like to form a section locally but are too small in number to do so and have to travel to Birmingham once a month to attend meetings. Could you, through your column, ask interested aquarists to contact Ray Francis with a view to forming a new F.G.A. section in South Wales?" (Interested guppy breeders in the area may contact Mr. Francis at 60 Broniestyn Terr., Aberdare, Glam. I hope there'll be enough new members to make the proposed new section a viable proposition.).

Mr. John C. Mann lives at 58 Rayners Lane, Harrow, Middlesex. He has the following to say: "I have been building up my collection of uncommon livebearers for about one year and the first thing I found was that they are almost unobtainable from shops. The only source I have found is from members of my local aquarists' society, Sudbury A.S., of which I am a member. At the moment my collection consists of *Heterandria formosa*, *Limia melanogaster*, *Poeciliastes pleurospilus* and *Phallichthys amates amates*." (A quick check in the new Dictionary shows the first mentioned fish to be the mosquitofish or dwarf top minnow; the middle two are not mentioned; and the fourth is given as the merry widow—which seems appropriate...).

Mr. Mann continues: "My greatest problems have been with the *Limia* and *Girardinus* species. The

females, after dropping their first brood, contract what I call 'wasting disease' and they get progressively thinner and eventually die. I have no idea what causes this as they feed well right to the end. My own breed of females has just reached maturity, so perhaps they will fare better. The *Heterandria* species is very easy to keep, but the females have a great appetite for their own young. The fry reach maturity in about two months.

The *Poeciliastes* and *Phallichthys* species are also undemanding and breed regularly. Recently I obtained some *Xenotoca eiseni*, which belong to the *Goodea* family. The males of this species are quite attractive, having a blue body and an orange caudal peduncle. I also find that they have a great appetite for fins! I had to pass them on to someone who had more room to keep them—but not before one of the females had dropped some young—of about 1/2 in. in length. I hope to obtain some *Xiphophorus milleri* and *montezumae* (Dictionary gives them as Catamaco and Montezuma swordtail) shortly. These are undemanding and require similar conditions to the more common *Xiphophorus* species." (I hope my references to the F.B.A.S. Dictionary have shown readers how useful this little publication can be—and have helped to keep both those who like and those who dislike proper names happy. If you have £1.00 to spare, or wish to buy a useful but inexpensive present for an aquarist friend, I would suggest this publication as an ideal Christmas present for any aquarist who doesn't already have one. My only minor complaint about the booklet is that it refuses to stay open without strong assistance—but I'm sure the majority of readers, unlike me, won't be attempting to refer to it while using the index finger of one hand and the small finger of the other to type *W.Y.O.*? This awkward method of typing resulted from a nasty accident that occurred to my left wrist, on Christmas Eve seven years ago, while I was attempting to remove broken glass from an aquarium frame. As usual I'll repeat my annual warning: take care when working with glass. A split second's inattention can maim a limb for life!).

The fancy coldwater fish I purchased for my nephew and for myself obviously weren't the healthiest of stock. Two of his five have died as has one of my two. Having set up both aquaria I know that the environment wasn't at fault in either case. Have any other readers had similar experiences with coldwater fishes bought recently?

For a future edition please send me a letter about any of the following—or anything associated with the hobby that takes your fancy: (a) The most horrible looking aquarium you've seen on display in a public place; (b) The most beautiful aquarium you've ever seen—whether yours or someone else's; (c) A description of the layout of plants, rocks, bogwood etc., plus

Continued on page 349

THE TENCH

An Appreciation by Arthur Boarder

THE TENCH is a well known fresh water fish which inhabits most of the European waters which are either stagnant or slow-moving. This fish can reach a weight of over nine pounds, but this would be very exceptional for one kept in a garden pond. The fish differs from other British fresh water coarse fishes by having very small scales and they are so deeply embedded that they are hardly visible. When Tench are being handled, they appear to be almost as slimy as an Eel. The general colour is a greenish-bronze, darker on the back and paler on the flanks. The belly is creamish in colour. The fins are rounded and so differ from most of the other carp species. I have seen it stated in some books that it is difficult to sex the Tench. I have found this not to be true. The male Tench has a spoon-shaped pelvic fin. This also has a very thickened outer edge, as if the fin rays there are double the thickness of the inner ones.

When small the Tench makes a very nice fish for the medium-sized tank, but in a pond it is quite at home and soon grows to a fine specimen. It may not always be evident in the garden pond as it prefers to lie well down in the water. Given a sunny day, the fish may be seen at the surface, often partly hidden by a lily leaf. The food of the Tench consists of worms and any larvae of insects and other water creatures. This fish can even eat a water snail and the tough water snail, *Lymnaea stagnalis* can be sucked from its shell. It has often been called the "Doctor fish", as it was thought that it prevented other fishes in the pond from becoming diseased. There is no truth whatever in this belief, but for all that I think that it is well worth having at least one in the garden pond. It is often referred to as a good scavenger for the tank or pond and although there may be some substance in this statement, a healthy, hungry goldfish is just as good a scavenger. However, as the Tench is mainly a bottom-feeder it can be useful in the pond; not that it will not take food from the surface as a few pellets, or a small piece of brown bread on the top, will soon bring up the fish and a large whitish mouth will suck in the food in a quiet move.

The Tench can be bred in a garden pond, and it need not be a large one. I bred these fish for many years in a pond which was not very large. A picture of this pond appears on page 30 of my book, "Cold-

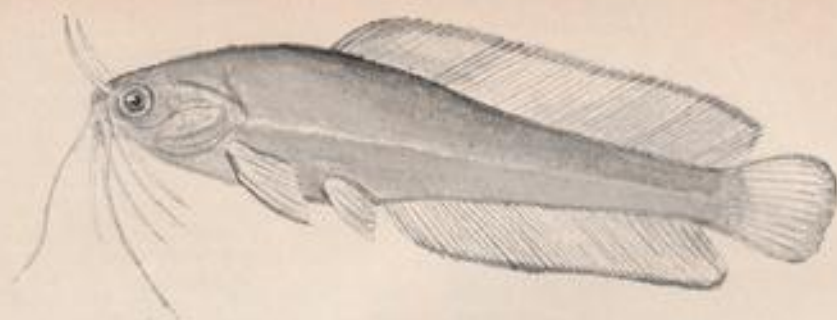
water Fishkeeping". The right-hand neck of the pond is shallow and this is where the Tench would spawn. This is a very strenuous operation and I have seen the fish jump right out of the water in their excitement. I once saw a male fish out of the water on the path, but it soon jumped back. I had two males and one female and when spawning was taking place, it sounded as if a dog was splashing in the water.

My Tench first spawned in July, 1947, and a team of six youngsters won me the coldwater breeder's cup at the annual show of the Harrow Aquarist Society in that year. A photograph was taken of them by Mr. Mandeville, whose wife was editor of the old Water Life magazine, under her maiden name of Marjorie Elwin. The picture, with article, appeared in a Water Life issue of early 1948.

To my surprise these youngsters were breeding when they were only two years old. Most books state that the breeding season of the Tench is May-July, but I never had a spawning until July in any of the years in which my fish spawned.

My Tench were a constant source of interest to visitors as I used to fish for them with a fat worm tied to a hookless line. This had a float and I used a small fly rod. The Tench would take the worm almost as soon as it was offered and could be played for some time, during which it shook the line and the rod bent nearly double. Although a fish could be played for some time, the fish would either take the worm or let go before its head could be raised from the water. It seemed as if the Tench enjoyed this game as no sooner was a worm offered than a bite would result almost immediately. The game never ended until all my stock of worms had been exhausted.

Once my young fish were breeding I took the old large ones to the local duck pond. Some years later the gardener of the Council got the scare of his life when he was retrieving a large wire waste-paper basket from the pond which had been thrown in by a lout who had nothing better to do. As he lifted the basket there was a tremendous thrashing among the paper and he dropped the basket back in a fright. Later with another's help he found that a large Tench had got in the basket, perhaps to search for bread scraps. If any of the original Tench survive in that pond I imagine that they could be specimen fish by now.



THE WALKING CATFISH

Written & Illustrated by Jack Hems

ON 25th May 1968, a nightwatchman on duty at a construction site near Boca Rotan, Florida, was amazed to see a large, torpedo-shaped fish, with long antennae-like barbels, making its way across bare ground. Not surprisingly an account of this amazing sight found its way into the Press.

Thenceforward there was no lack of narrators who told of ghost-pale fish which perambulated about well-kept driveways and clambered over patios after dark. Inevitably some of the taller stories rather stretched the credibility of the less gullible populace. Perhaps the most sensational was the story about the terrified housewife who had watched her German shepherd dog defending itself against the fury of one of these backyard-invading fish.

Early one morning, however, a piece of information reached the Florida Game and Freshwater Fish Commission which sounded too alarming to dismiss as a joke. The informant was a bartender who related that several hours previously, north of Fort Lauderdale, he had seen troops of walking catfish heading across the highway in front of his homeward-bound car. He substantiated his story by producing three of the fish which he had stopped to pick up before he completed his journey.

When biologists of the Florida Game and Freshwater Fish Commission visited the spot they found car-crushed remains of a catfish known to science as *Clarias batrachus*. Clearly the walking catfish were 'home bred' descendants of an albino form of the species which had been introduced into Florida some years earlier by dealers in tropical aquarium fish.

The exact date in the 1950s or 1960s when young *C. batrachus* first reached Florida from their native south-east Asia is not known—at least to the writer—but apparently not a few of the species had climbed out of dealers' stock ponds in search of more pleasurable haunts, or had been tipped into local freshwaters by thoughtless hobbyists who found themselves unable to cope with the idiosyncracies of this catfish in its adult form.

Naturally enough scientists and fisheries' administrators were absorbingly concerned with the effect *C. batrachus* would have on freshwater ecology. Would the fish categorised as predatory endanger the lives of indigenous species? Would *C. batrachus* find its way into Everglades National Park and beyond? Further, as *C. batrachus* is not finical about its food would its presence spell disaster not only for native

fishes but also for swallowable amphibians and other aquatic life and thus upset the whole balance of nature?

Seemingly, up to the present writing, the worst fears have not materialised. Yet as recently as 1971, Vernon Ogilvie, an American biologist, expressed the educated guess that *C. batrachus* living wild in Florida could number millions.

By and large, everything seems to be in favour of this catfish taking over many of the waterways of the southern states. Exceptionally it will stand a temperature as low as the forties or as high as the nineties (°F). Ordinarily, however, a temperature in the seventies (°F) suits it best. It breeds freely (at no special season of the year) if conditions are right. That it can move across ground from one body of water to another makes its control far from easy. Overland journeys are usually undertaken at night, that is when the ground and herbage are wet with dew. A downpour of rain enables it to go a-walking in daylight hours. It is said that it can travel overland at the rate of about 25 feet a minute. Progression out of water is accomplished by thrashing the tail about and digging each sharp-tipped leading spine of the pectoral fins into the ground: then a heave forwards. Attempts at poisoning the fish in isolated bodies of water have met with little or no success. The catfish merely vacate the poisoned waters for submerged pastures new.

That *C. batrachus* can stay out of its natural element for hours on end (provided its body does not dry out) is easy to explain. The rear part of each gill has a most efficient accessory air-breathing organ. In water, the fish surfaces every so often for an intake of atmospheric air.

All species of *Clarias* are characterised by an elongated body, with a ribbon-like dorsal fin placed a short distance behind the head. This fin terminates at the root of the tail. The anal fin extends from about the middle of the underparts to the tail. The caudal fin is blunt. No adipose fin is present. There are four pairs of barbels. The maxillaries are long and whip-like.

The range of the genus *Clarias* in nature extends over most of Africa. Also, from eastern India to

North Vietnam and thence to the Philippines, Malaysia and Indonesia. *C. batrachus* itself appears to be quite widely distributed in Sri Lanka (Ceylon), eastern India and the Malay Archipelago. It occurs in an albino form as well as in shades of brown to muddy green or grey, darker above than below. It reaches a length of about 18 in. in the aquarium. A length in excess of this in the wild. Some species of *Clarias* grow to about 4 ft. They make a most acceptable food for some people. Not for all, however, on religious grounds. This is mentioned by Francis Day in his *Fishes of India*.

I have kept a few different species of *Clarias* over the years. I have always found them highly interesting but troublesome to care for in their larger sizes. For one thing, they are very active at night and make frequent leaps above the surface in an attempt to leave the water. (Or perhaps leaping is just a habit.) They are strong enough to shift an unsecured or unweighted glass cover. Once an escape route presents itself, the fish are over the side and away across the floor. A large pair of *C. angolensis* I owned in the early 1950s often succeeded in getting out of their tank. I would find them, when I missed them and after the usual fatiguing search, greyed with minute specks of fluff and dust under a bookcase or some other heavy furniture.

Plants in their aquarium are a waste of time. They uproot them as they burrow into the sand or make nocturnal dashes up and down the sides of their tank. A piece of plastic drainpipe or some pieces of slate placed one on top of the other to form a sort of cave provides a suitable shelter.

Clarias catfish are knowing creatures and soon learn to take food from the fingers. In doing this they almost always splash water over their benefactor's face and shirt or jacket front. Pieces of raw red meat, strips of fresh haddock, uncooked cod, fresh herring, and the like, plain boiled macaroni, lumps of plain boiled rice (set stiff and lumpy), maggots, flake food, earthworms and so on go down well. Given spacious quarters, clean water, and adequate food, the life span of these fish is uncertain, but, in some species, is well in excess of seven or eight years.

WHAT IS YOUR OPINION? continued from page 346

types of fishes, you'd use to produce an attractive 24 in. × 12 in. × 12 in. aquarium for display in a cinema or theatre foyer (avoid diagrams, if possible); (d) Why do you keep fishes and aquatic plants? (e) Please pass on any original tips that might be useful to other aquarists. (f) Have you managed to spawn the cardinal tetra? If so, please send me details. (g) What problems do reptiles and amphibians present

during the winter months? (h) List the three tropical plants that grow best in your aquarium and describe the conditions under which you cultivate them. (i) How many species of fishes have you managed to breed? Which was the easiest and which the hardest? (j) Please send me details of your experiences with any species of Rasboras.



OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

TROPICAL QUERIES

by Jack Hems

Could I keep discus and cardinal tetras in the same tank?

The short answer to this is yes. Remember, though, that discus are more demanding in their requirements than cardinal tetras and their aquarium must be kept scrupulously clean and at a temperature well in the seventies or eighties (°F). Also, water to suit discus must be very soft and quite acid.

How can I distinguish the sexes of *Cichlasoma meeki*?

In well-grown fish the male is the brighter coloured of the two and his dorsal and anal fins are fuller and terminate in needle-like points or extensions.

I have just purchased some golden dwarf cichlids. I would like to know the scientific name of this species, where it occurs in the natural state, and whether it is easy to keep and breed.

The golden dwarf cichlid is *Aequidens awani* from Brazil. It is quite docile out of the spawning season and flourishes well on the usual flake foods, live foods and shredded lean meat. It is comfortable at a temperature in the middle seventies (°F) and deposits its eggs on cleaned stones or other surfaces after the manner of better-known species of *Aequidens*.

I have a 27½ in. × 15 in. × 12 in. tank stocked with two small oscars, one small Jack Dempsey, two medium-sized firemouth cichlids, one Malayan angel fish, two kribensis, a butterfly fish and some catfish. I am thinking about moving them into another and larger tank. What size tank would suit them best?

Go in for a tank at least 48 in. × 15 in. × 12 in. Your choice of fishes is not good at all. Some of them grow large and are far from docile by nature. Thus it will not be long before quarrels break out. I think

it would be a good plan if you read all the good books on tropical fishkeeping in your main lending library.

My dealer has some fish which he calls flag cichlids. They look docile and bear a marked resemblance to some of the gouramies in general outline and finnage. Can you give me their scientific name, country of origin, and some idea of their behaviour in the aquarium?

Flag cichlid is one of the popular names given to *Cichlasoma festivum*. In the main, this species is mild-mannered, apt to be bullied by more boisterous and assertive fishes, and spends a lot of its time cruising about in the middle or upper levels of the water. It attains a length of about 6 in. and is native to the Amazon Basin and north-eastern South America.

I should be grateful for any information you can give me on the breeding habits and sexual differences of the tinfoil barb.

The tinfoil barb (*Barbus schwanenfeldi*) breeds like the general run of barbs. That is the male chases the female about the aquarium and as the excitement mounts eggs are scattered, and fertilized, in mossy or feathery underwater vegetation. Young tinfoil barbs are not easy to sex. Large ones show fuller sides in the female and richer colours in the male.

I would like your advice on buying a book about Malawi cichlids. Which one do you recommend?

At the present time you can hardly do better than buy the 4th edition of *African Cichlids, Malawi and Tanganyika* (T.F.H. Publications).

Please supply me with detailed information on the care and breeding habits of the Siamese Fighting Fish.

It would take more than a page of this magazine to

give you even a brief outline of the care and breeding procedure of *Betta splendens*. I suggest, then, that you send 22p to this office for a copy of our informative booklet entitled *The Fighting Fish of Siam*.

Can you tell me anything about a livebearer called *Xiphophorus montezumae*?

X. montezumae is fairly widespread in Mexico. The male attains about 2 in. The female about 2½ in. Coloration is variable. The scales, however, have dark borders which give an attractive net-like effect. The elongated bottom rays of the caudal fin are less produced than in the male *X. helleri*.

I have some fry following a spawning between a Texas cichlid and a convict cichlid. Has such a fertile mating occurred before?

I do not know whether the Texas cichlid and the convict cichlid have ever mated and produced young but hybridization among certain cichlids, species of *Cichlasoma* among them, is not unknown. The British Cichlid Association would no doubt prove helpful in supplying information about hybrid cichlids.

Recently I bought a young piranha with dark spots on a white ground. I should like to know the formal name of this fish and its maximum length when full grown.

The spotted or white piranha is known to science as *Serrasalmus rhombeus*. It attains just over a foot in the wild state and, I imagine, less in the ordinary home aquarium.

My two-foot tank houses zebra fish, red-nose tetras, harlequin fish, cardinal tetras and rosy tetras. If I introduced a marbled angel fish into

this community would it attack and eat any of the other fishes?

Your aquarium would certainly not become a battlefield if you introduced a marbled angel fish. Do remember, however, that angel fish grow rather large and this might lead to your smaller fish becoming shy and nervous or you might even upset the balance of your tank.

Would it be safe to feed garden slugs to my oscars?

Provided slugs are collected from ground not treated with a pesticide or such aids to garden management as weed-killers or moss eradicators, then no harm should come to your oscars. The small grey slugs make a good food for most fishes large enough to swallow them.

What hints and tips can you give me about the care and breeding of *Aphyosemion filamentosum*?

This species flourishes best in soft peaty acid water kept at a temperature in the upper sixties (°F), raising this a few degrees for breeding. The eggs are usually deposited in peat litter or moss on the bottom. After spawning, the parent fish should be removed from the tank and the eggs almost dried out in peat or the debris they were placed in. After six to eight weeks water at about 75°F (24°C) must cover the eggs and the fry should emerge from their cosy bed a few hours later. However, it is not so easy as it sounds and I suggest you read a few articles or a specialist book on killies. *A. filamentosum* is not long-lived, requires small live food, and a pair will live quite contentedly in a few gallons of water. A slightly brackish water is recommended by some aquarists who keep and breed this species.

COLDWATER QUERIES

by Arthur Boarder

I have a fish with what appears to be a blister on the head between the eyes. What is it and how can it be cured?

If the blister is not inflamed I suggest that it is left alone. Should it burst the wound can be dabbed with T.C.P. whilst the fish is being held in a wet cloth. If the swelling is not transparent, it could be a cyst and if so nothing can be done until it bursts when the treatment as above can be adopted. Some fish may carry a cyst for months and be otherwise perfectly healthy. It could be caused by a blow such as could be suffered if a fish jumped from the water and hit the tank cover.

I recently found one of my pond goldfish with

something wrong with one eye. It appeared to be white all over with just a small black dot in the middle. The eye appears to be retracting into the head. Do you think it is a cataract?

It could be what is termed a worm cataract. This is caused by many tiny white worm-like creatures which cover the eye. If the eye is as badly affected as you suggest I do not think that there is a cure at this stage. The fish could lose the eye but still be perfectly capable of existing with the one eye. Very early treatment might have been successful. A careful wiping of the eye with a mixture of iodine and glycerine would have helped matters I suspect. I am inclined to think that such troubles could be introduced with water snails

which had been obtained from the wild. I am always very careful not to use any plants or live creatures from a pond in the wild.

I hope to breed goldfish in a garden shed and would like answers to the following questions. What size tanks to use; is running water necessary; lighting; heating etc? Should I have plenty of windows at the sides or roof and where to site the tanks?

There is no need to have running water and there may be little need for heating. Lighting can be from side windows but there need not be too many, as in the winter they would allow too much cold to enter and if you have glass tanks, these could be cracked by excessive cold. As for heating, this is very helpful when hatching and rearing the fry. However, there is no need to warm the whole shed. One or two 100 watt heaters in the hatching tanks will be enough. In severe weather you may have to give some extra warmth to prevent tanks from freezing. A good size for the tanks is the usual 24 x 12 x 12 inches. These are usually easier to obtain. However as you have the use of a shed it will be a good plan to have a few larger tanks sunk into the ground. One could run the length of the back. This tank could be fitted with slides so that fish could be partitioned off if necessary. As long as you can prevent the water from freezing, there is no need to provide any artificial warmth in the winter. The adult fish prefer a cold spell then. To get your young fish through the winter safely it is important to grow them on as much as possible before that time and extra warmth, up to 75°F., is very beneficial, as the fry grow twice as quickly at that temperature, as at 60°F.

Is it possible to obtain Calico orandas, and if so, where could I get some?

It is possible to get Calico orandas nowadays and I will enclose an address from which you can obtain some. If you intend to try to breed some good ones you should inform the supplier as to your needs. You must also realise that it will take a year or two for the fish to develop the proper hood.

I have just made a garden pond, 5 ft. x 5 ft. and 2 ft. deep in the centre. The lilies are planted in plastic baskets with one or two floating plants on the surface. Would it be all right to have about two inches of gravel on the bottom of the pond?

There is no need to have any gravel or soil on the bottom of your pond. You mention, 'lilies,' and I think that if you have more than one in such a small pond, you will have over-planted it. If you have two miniature or *Nymphaea* types you may get away with it, but two medium growing kinds could soon cover the

whole surface of the pond. If there is nothing on the bottom of the pond, it will make it easier to clean out the pond each year, and the droppings from the fish will collect there and be available for the lilies which will soon send out their roots from the baskets and so find the nourishment and help to keep the water clear.

I have some shubunkins in a tank and they have some blood streaks in their fins. What is this trouble and how can it be cured?

The trouble is what is known as fin congestion. It can be caused by bad conditions in the tank or by a chill. If the tank is subjected to a sudden fall in temperature, this can upset the fish and cause the fin congestion. One almost certain way is to raise the temperature of the water for the cure. At about 70°F., as long as the water remains well oxygenated the trouble should soon clear up. Some aquarists recommend adding some sea salt to the water but this can be a danger if it is overdone, as the salt will remain in the water too long.

I have a garden pond about 6 ft. x 4 ft. and 18 inches deep. I have 24 4-inch goldfish and lately have found that some of them have their dorsal fins almost rotted away. One or two have died. Can you give me a reason for this?

The fins of the fish will rot when they are attacked by a form of fungus. This usually only affects fishes which are unhealthy. In such conditions the mucus protective covering gets disturbed and may fall away. The fish is then open to attacks by any disease. I think that you may have had too many fish in your pond for its size and you may have been overfeeding. This will cause a bad condition of the water and the fish soon suffer. Clean the pond out, check up on the number of fish you have and go easy with the feeding as any food left uneaten can soon pollute the water.

A short time ago I was given a large shubunkin but it never seemed to be able to swim properly. It had also a very curved body and used to gasp at the surface. What is wrong with it?

The fish sounds as if it is a runt and if so there is no doubt why it was given away. It is a pity that any pondkeeper should give such a fish to a beginner in the hobby as it is very disheartening for him to have trouble with it. The fish should have been destroyed long ago and was never likely to make a good healthy specimen. Any fish born in a natural pond suffering from such a disadvantage would soon be eaten by predators. The best thing you can do is to destroy the fish and the best way I know is to dash it smartly on a hard surface, such as a concrete path. I know of no quicker method of disposing of a weakling fish.

Can you please tell me how big goldfish have to be before they breed?

A goldfish of about three inches long overall could breed. So much depends on the health of the fish and the condition of the water. Few goldfish are likely to breed in water which is lacking in oxygen. Any healthy goldfish will have the urge to spawn when conditions are right.

I have found one or two of my goldfish with fin-rot and Fungus disease on them. What can have caused the trouble? I have a number of frogs in the pond and wonder if they have attacked the fish?

I do not think that the frogs can have been attacking your fish. In the spring when they first come to a pond to spawn, a male frog will clasp a female frog and if it gets near a fish, can also clasp it. If it not removed it could kill the fish or seriously injure it. However once the frogs have spawned, usually by the end of April, they are not likely to harm the fish. I have never known a frog to eat under water. There are other pests in many ponds which could cause some damage and then Fungus disease sets in. All healthy goldfish are covered with a mucus protective covering and as long as this is intact, the fish can remain impervious to most diseases and many small pests. Once a fish becomes unwell, usually through bad conditions in the water, the mucus covering becomes deranged and the fish is then easy prey to troubles. The mucus can be easily removed by careless netting and so be careful not to do anything which is likely to do this. You mention that you have seen some of your fish make a sudden twisting dash in the water for no apparent reason. This is a usual sign that a pest of some kind is attacking the fish. It may be a leech or a fish louse. Examine any fish acting as stated and you may find the answer to your problem. A strong magnifying glass would show up lice and also flukes, and leeches are usually large enough to see without a glass.

I went to my local pet shop for some plants for my indoor tank and was told that none were available as they were out of season. Is this correct please?

Water plants for indoor tanks should be available all the year round. Some coldwater plants do die down somewhat during the winter but usually most tanks are kept in a living room where the temperature never falls very low. Plants for tropical tanks are always available all the year round. Plants for a garden pond are not usually on sale during the winter months as most of them are resting. It is in the spring when such plants come on the market and can be planted in the pond. You will find dealers advertising in "The Aquarist & Pondkeeper" who will supply your needs.

I am setting up a coldwater tank and have read that I require a plant for every square inch of the tank. Is this necessary?

If you want a dense thicket of water plants in your tank so that the fishes will have nowhere to swim and will be out of sight most of the time, do as you have read. With the usual base compost and a few fishes any healthy plants would grow apace. You must not be misled by the number of plants you may have seen in a furnished tank at an exhibition as these are set up for show and are likely to have too many plants for a tank which has to function for years. For a 24 x 12 x 12 in. tank, I suggest about three clumps of four stems at the back of *Lagarosiphon major* one clump at each back corner, a few stems of *Ceratophyllum demersum* in three bunches near the rocks towards the back and a few rooted pieces of *Vallisneria spiralis* in about the middle of the base. A couple of stems of *Hygrophila polysperma* sited away from the centre will be all that is necessary. I know that some aquarists state that the latter plant is a tropical plant but I have grown it with success in a coldwater tank for years. For a tank indoors I do not think that any more plants are required as if you try to grow too many species in the one tank you may find that some will not thrive at all. If a tank is planted as stated it should last for years without the need to add any more plants but some pruning may be necessary during the summer months.

I have noticed one or two very small wounds on a couple of my goldfish in the garden pond. They are only about a quarter of an inch across. What do you think has caused them?

Wounds the size of those stated have been caused, probably, by fish lice, *Argulus*. These pests are quite small and can swim around until they find a host. They are only about three sixteenths of an inch in diameter and are practically transparent. They resemble a tiny Plaice and they suck the juices of a fish. They may leave the fish to lay their eggs and so a wound is left where they have fed. These wounds can turn septic and can be dabbed with neat T.C.P. whilst the fish is held in a wet cloth. There may be more of the pests on some of the fish. Examine them closely as it is possible for one of the pests to be almost hidden at the join of a fin to the body. One sure way to rid a fish of the pests is to immerse it into a solution of a half teaspoonful of Dettol to the gallon of water. The fish must be held in a net and only left in the solution for about twenty seconds. Usually as soon as the fish is immersed, any pest will leave the fish immediately. If the fish is left in the solution too long it will turn over. It will soon return to normal when returned to fresh water. I have seen lice leave a fish at once as soon as it is immersed and the pest has gone into a spiral dive to the bottom and died.

I have seen it in print that Koi have never been bred in this country. Is this correct?

It is certainly not correct; plenty of people have been breeding them for years now. I cannot remember how long ago it was, but it is certainly several years, when I saw many nice young Koi which had been bred by Mr. H. Tisbury, of Romford. I think that a fair sized pond and very good well oxygenated water is essential for success with these fish. It has been stated that the Koi must be of a fair size before they spawn but Mr. Tisbury tells me that he has seen quite small Koi joining in the spawning chase with larger fish, but of course it is not possible to say with any certainty whether they are actually spawning themselves.

I have a four foot tank and would like to know if it will be over-stocked with the following fishes:—one Koi, 8½ in., two tench 5 in., one comet 5½ in., two catfish 5 in., one Bitterling 2 in., two goldfish 3½ in., one veiltail 4 in., and one fantail 4 in. Could I add more fishes?

Your tank will hold 20 inches of body length of fish if it is 12 inches wide and if 15 inches wide will take 25 inches. I do not think that you have chosen wisely as the Koi would soon be too large for your tank and would be better off in a pond. The catfish could eat or attack any small fish and the Bitterling could make a meal for one of them. Catfish are carnivorous and have no place in a tank with smaller fishes. You also ask what the fishes would fetch if you wanted to sell any of them? This is impossible to say, it is one thing to buy a fish from a dealer and another altogether to sell one. You can compare the prices asked by suppliers who advertise in the "Aquarist & Pond-keeper", but this may have little relation to what you could get for them selling privately. Some dealers might be willing to exchange a smaller fish for a large one but I would not be surprised if some would be unwilling to do this for fear of some possible infection or infestation.

We wanted to treat our pond with Steragin but wonder if it will have harmful effects on the Orfe. We have in the pond, Koi, goldfish and two large golden orfe.

I do not know what the reason is for you wanting to treat the pond. If it is that the water is green with Algae, this may clear by itself as the weather cools down. Although one must always be careful to use such substances according to the makers' instructions, it is not easy to estimate the exact capacity of a pond and also the amount of water plant life in the pond can have a bearing on the effectiveness of the treatment. I suggest that instead of treating the water you will do better to clean it out completely once most of the leaves have fallen from any nearby trees or shrubs.

I would like to breed water fleas so that I can have a good supply for feeding my fishes. Can you give me directions please?

Daphnia can be bred as long as certain conditions are observed. These crustaceans feed on free-floating Algae and *infusoria*. They are usually found in duck or cattle ponds where there is a quantity of decaying matter such as manure. A small pond or a large tank should be got ready for the first stock. Do not use fresh tap water. Some from a pond, preferably a green water one, or even the water from an indoor tank which is removed at weekly servicing. Fresh tap water might kill the small bacteria and *infusoria* which is the food of the *Daphnia*. You can create *infusoria* by putting in some crushed, outside leaves of lettuce or even boiled hay. A student's microscope is very useful to make sure that some *infusoria* are present. When plenty of this food is seen in the pond or tank, a few *Daphnia* should be introduced. Add extra *infusoria* every day or two and remove some of the water at the same time. Dip this out through a very fine nylon net. *Daphnia* discontinue breeding when the temperature of the water drops below 40°F. and a type of egg is laid which does not hatch until the spring. When topping up the *Daphnia* tank, never use fresh tap water.

I would like to remove soil which has fallen into my garden pond. Is there a suction pump which I could purchase for this job?

I know of no suction pump powerful enough to remove the soil from your pond. Even the large suction pumps used by the G.P.O. to remove water from inspection pits, would not shift the mud in your pond. If the pond is not too large it should be emptied and then the mud could be removed. If this is not possible you can shift a large quantity with a saucepan tied to a broomstick. An hour a day at this task should soon remove much of it.

I have a 40 watt lamp in a hood over my cold-water tank, which is 24 × 12 × 12 in. I find that the lamp does not last very long. Any suggestions please?

It is possible to get what is called a (Heavy duty) lamp so you could shop around for one. I have found that most lamps do not last very long as they produce too much heat in a hood. It is surprising how much heat such a lamp can give off and the upper stratas of water can be quite warm. I have found a way to increase the life of a lamp. In most tank covers there are insufficient apertures to allow much of the warmth to escape. I have remedied this by cutting two more openings at the back of the hood. I just cut two slits in the hood so that a flap of about two inches by one, could be partly lifted up. This allows the heat to escape and prolongs the lamp life.

From a Naturalist's Notebook

by Eric Hardy

Is a common English freshwater tench worth £850? This is what only a 4 lb 7½ oz specimen from the Lancaster Canal meant to its captor winning a sponsored angling match with 1,800 competitors, this past autumn. In October a 6 lb 14½ oz North Wales bass netted its captor £700. They illustrate the ridiculous position of sponsored sport when the interest is not fish and fishing, but a money-gamble for neither fish was rare, or a record. Individual sea-fish captures have meant so much as £2,000 in coastal matches, and this mass fishing either depletes stocks of slow-breeding tope and skate to endangered low levels, or makes freshwater fish hook-shy.

Australia is considering a proposal from its fisheries council to ban importation by the aquarium trade of goldfish and 41 other fish without a quarantine clearance. This is partly to avoid diseases, and an interim time is proposed for breeders to stock ponds to meet future demand. There is already a ban on importing live or dead salmon, trout and other salmonoid fish, or their eggs, for the same reason. Australia's long isolation from other land-masses kept it free from most freshwater fish-diseases, though they have their own protozoan and helminth diseases. Infectious pancreatic necrosis, the virulent salmon-disease of British spawning beds since 1971 in Scotland, first identified in U.S.A. in 1958, reaching France in 1965, Japan 1970, and which made news in recent years, is now known to be carried occasionally by cyprinids: pike, perch, catfish, lampreys and marine sable-fish, as well as the salmonids to which it was formerly considered peculiar. Infectious haematopoietic necrosis virus of salmonids reached Australia in 1962. Protozoan whirling disease of European salmonids reached New Zealand in 1971. First found in Germany in 1904, it reached France in 1952, then all Europe. Fish-tuberculosis has occurred in Pacific quinnat salmon in an Australian hatchery. Oodinium, a protozoan disease of marine aquarium fish, is already in Australia and common white spot disease is present in many hatcheries there. Not all important fish-diseases are included in the International Zoo-Sanitary Code of the Office International des Epizooties.

The centenary of the importation of German carp into U.S.A. in 1876, was celebrated with regret. Like the white Amur or grass-carp imported in 1962, it is regarded an undesired alien for ecological reasons.

Of all aquatic life, the common frog claims most

literature. Ever since Marshall's monograph on this amphibian, which I copied laboriously, page by page in my student days (because I couldn't afford a copy) before the advent of photo-copying, this simple vertebrate has been for over two centuries the set subject for studying most things from simple zoology to deeper problems of the nervous system. So a new 1,100 page handbook on *Frog Neurobiology* by Prof. Rodolfo Llinas, of Iowa, published recently by Springer-Verlag of Berlin at \$184.50, adds to the fame of *Rana* and an enormous number of other Anuran species. The electro-physiology of its nervous system is the main theme, reminding the reader that "the frog, as a biological preparation, will become even more important in the future in view of its hardiness and the simplicity of its care."

Contrary to general accounts of the frog's part in Galvani's electrical discovery, another of my old books, Dr. Wm Carpenter's 1877 "Animal Physiology", relates how Prof. Galvani's wife was preparing soup from frogs she had skinned. Laying them on a table near the conductor of a recently charged electrical machine, she touched them with a scalpel and observed the muscles to convulse strongly. Her husband found they had received some of the electricity. Volta repeated the experiment and found the effects much stronger when the electricity was sent through 2 plates instead of one. The experiments then progressed to trying the voltaic battery upon the dead bodies of criminals recently executed!

Collecting by children takes third place to destruction and pollution of ponds as the cause of the continued decline of the common frog in the London area, according to the annual report of London Natural History Society. Many distribution maps have been biased towards the southwest, where most of the recorders lived. Though none of its reporters mentions birds-of-prey, the report recognises the tawny owl as a predator upon frogs. Greenshanks have been noted eating large frogs in Austria, and after my recent mention of the herring-gull as another occasional frog-eater, the Philippines weaver, *Ploceus philippinus*, has been added to the list of birds feeding on frogs by Bombay naturalists.

The grass-like water-fern or pillwort, *Pilularia globifera*, which grows on the edges of acid lakes and ponds from Anglesey's Mynydd Bodafon to the Hebrides, has been found at a second Surrey site on the edge of London near Walton Heath. It used to



Endangered by the lowering water table of its drying dunes at Formby-Birkdale, near Southport, the local dwarf Grass of Parnassus, *Parnassia palustris condensata*, has a shorter stem and larger flowers than the typical plant of boggy moors.

grow on Putney Heath too. Royal fern has been found on Esher Common and the water-crowfoot *Ranunculus baudotii* in a chalk-pit in the Grays area of south Essex.

American crocodiles are not the only endangered species. A Scottish herpetologist loaned by the U.N. to the Indian Forest Service, is conducting a campaign to save the remnants of Northern India's gharials, the world's oldest crocodile family, from the skin-trade. He plans to breed and farm them as a village industry at Satkosia Gorge in Orissa and the state of Bihar to satisfy both the trade and conservation. This harmless, scaleless crocodile haunts cold waterfalls on fast Himalayan rivers. It has the longest snout of crocodiles. In 1975, the first ever were hatched in captivity at Nandankanan—42 by artificial incubator, in a 30 ft. deep 600,000 gal. artificial pool. This will serve as a sanctuary on the Mahanadi river, with a captive-breeding programme for restocking Satkosia Gorge. The state of Uttar Pradesh hatched 20 in the

Corbett National Park. 67 gharials are estimated to be in world zoos, so there is no need to gather further from the depleted wild stock. Conservationists are also "battling" to save coral-reef haunts of New Guinea freshwater crocodiles and estuarine crocodiles from a super oil-port plan at the tropical Palau archipelago.

It is easy to miss certain aquatic insects, declining from the drainage of fens and the filling of farm-ponds, or to quote pollution for the loss of others. But apart from ups and downs with climatic and habitat changes, the extended field-studies of modern times have added new records without evidence of whether this is extended range or species overlooked from lack of specialised knowledge. A water-beetle which certainly seems to have increased its range, *Ilybius subaenus*, was known only from S.E. England a century ago, but had progressively reached Nottinghamshire, Durham and Forfar shortly before the last war. A new British water-beetle, *Stenelmis caniculata*, the largest of a family living permanently on the bottom of stony lakes and streams, was found in 1960 at the northern part of Lake Windermere. Since it first appeared in Britain in 1921, the North American beetle, *Stenopelmus rufinusus* has spread widely over southern England, feeding on the tiny American water fern, *Azolla filiculoides* with which it was originally imported by aquarists. Because of their special habitats, some aquatic insects will always be restricted. Of Britain's 192 caddis-flies, 3 species are known only from Lakeland, including *Glossosoma intermedia*, making a largish, round-topped case, in the stony Church Beck above Coniston. Yet the angler's Grannon, *Brachycentrus nubilus*, is apparently unknown in Lakeland. Another, *Linnephilus binotatus*, formerly thought confined to Norfolk, is now known from 9 English counties, including Lancashire. The number of caddis in small streams varies with their pollution.

The water-bug *Ilyocoris cimicoides* was found recently for the first time on the Lancashire dune-pools south of Southport, despite 6 generations of experienced entomologists combing the area. The lesser waterboatman, *Corixa dentipes*, first discovered in Britain in 1928, now ranges throughout Britain; but Lakeland's only representative of 10 British species of *Gerris* water-boatmen, the larger *G. naja*, is dying out from increasing detergent thrown from house-boats and lowering the tension of the water surface-film until it is unable to hold the suspended bug as it takes in air. This water-boatman hibernates in the dry stone-walls of old Windermere boathouses, which mean much for its survival because it won't apparently occupy those with concrete or cemented walls.

Normally one of the latest dragonflies still on the wing in October, the red *Sympetrum*, was still flying and pairing on the Dee estuary salt-marsh at Hoylake

Red Rocks reserve in the middle of October 1976, though I recorded the larger brown *Aeschna* flying the previous mild November. Dragonflies are among the aquatic insects suffering from the drainage and pollution of our wetlands, and the 1976 drought, though the common *Ischnura elegans* tolerates filthy water. Drainage has brought the Norfolk-breeding *Coenagrion armatum* to the brink of extinction and greatly reduced the range of the southern *C. mercuriale*, the green *Lestes dryas*, the small red damselfly *Ceragrion tenellum*, and *I. pumilio*. Sewerage-pollution exterminated the last British colony of *Oxygastra curtisi*, and a high tide in 1953 wiped out the last colony of *Coenagrion scitulum*, in Norfolk. Otherwise, climate is the main barrier to their range, for only one of 43 British dragonflies inhabits Shetland, whereas 34 live in Hampshire—and 10 in London's Richmond Park.

Nearly 400 British Chironomid midges and blood-worms are a specialist's job to identify. The rare *Buchamonomyia thienemanni*, first discovered to science in a mountain stream in central Germany in 1955, then in Baltic amber of Eocene times, had no further record until its discovery in the River Fleck in Killarney, along with a dozen other arctic-alpine and Lusitanian species, in the summer of 1974. Obviously this was an insect long overlooked.

Semi-aquatic waterside or bog-plants continue to decline from drainage and drought. It was unfortunate for them that 1976's special European "Wetlands Year" coincided with the worst drought in modern times. It is not a modern problem, however. Six were exterminated in 300 years. The alpine butterwort became extinct in Britain when its bog on the Black Isle of Cromarty was drained in 1909, and the slender bog-rush, *ferrugineus*, between 1948 and 1952, when the Loch Tummel hydroelectric scheme drowned its last site. 25 other bog-plants are now endangered species. Eight reduced to less than a third of their former haunts include only three or less sites for water-germander of Devon's Branton dunes or burrows, the Shannon basin, and a disused Cambridgeshire claypit; great fen-ragwort, rediscovered in a ditch near Wicken Fen recently; and the pale blue fen-violet at Woodwalton Fen and the Irish Burren, as well as western Galway and Mayo.

Six endangered species occupy waters which dry out in summer—strapwort collected by botanists in 1959 from a Derbyshire railway, by the gravelly pools of south Devon's Slapton Ley and in Hertfordshire and Northumberland. Botanists collected it also from Freshfield railway siding opposite the signal-box, and the east side below Formby station, near Southport from 1926-1949. Brown galingale or *Cyperus*, which grows by muddy ponds in the New Forest is common on Brema Common in south Hants; starfruit or *thrumwort* (like a miniature water-plantain) is on the

edge of gravelly ponds on a Buckinghamshire common; grass poly which I've had in recent years at Southport and on Hightown dunes, also occupies quarries near Gorey Castle, Jersey; the brush-like small fleabane is by the Milford to Witley road in Surrey and by muddy Wiltshire ponds; and adder's tongue spearwort or snakelike, varies annually in quantity in a marshy meadow at Badgeworth Pool reserve near Gloucester and Up Hatherley near Cheltenham, and a pond on Hawkesbury Common. Maybe the picture is not quite so gloomy as the Biological Records Centre of the Nature Conservancy paints it, for although their distribution-maps now record these latter 6 only in 26 of the 10 km. squares where formerly they grew in 222, and the 8 bog-species are reduced from 111 to 33 squares, not all records are sent to the Records Centre, or the more autocratic of county recorders. Indeed, not everyone who finds and identifies a rare plant is a botanist collecting for his herbarium. Fully aquatic plants have lost 60 per cent of their former records; but many of us have learned to our cost that giving a rare plant-site to an "official" recorder, or to a university botanist is no more security for its conservation, while to give it to a botanical student is often fatal, as we found with our Lancashire bladderwort. I find the amateur aquarist the best conservationist at heart.

ONE OF THE FAMILY!

By Hilary Maynard

My 1st is in COMMITTEE but not in CLUB,
My 2nd is in LARVA but not in GRUB,
My 3rd is in ELECTRONIC but not in FLASH,
My 4th is in BATTERING and also in BASH.
My 5th is in GRUMBLE but not in GROUSE,
My 6th is in INSECT and also in LOUSE.
My 7th is in PUDDLE but not in POOL,
My 8th is in COLD-WEATHER and also in COOL.
My 9th is in RIDICULOUS and also in SILLY,
My 10th is in RACEHORSE but not in FILLY.
My 11th is in STENOGRAPHER but not in TAPE,
My 12th is in SILHOUETTE but not in SHAPE.
My 13th is in TWINKLE and also in TWITCH,
My last is in BOUNDARY and also in DITCH.
My whole is most popular, he's really an ace!
He'll grow to ten inches, if given the space!

Answer on page 363

Rasbora maculata

by Jackie Farmer

Rasbora maculata is a pretty and diminutive fish growing to 1 in. in length. Native to the Malay Peninsula, it prefers soft and acid water; very undemanding fish, they are best kept in small shoals.

I obtained my first five pairs of *Rasbora maculata* from a friend, with the idea of attempting to breed them.

An 18 in. × 12 in. × 12 in. tank was set up using 2 gallons of peat water, the remainder being ordinary tap water which is quite soft in this area of North Devon. The base of the tank I covered with lime-free gravel and planted with a few Water Wistaria. After a week I had a total hardness reading of 3DH with a pH of approximately 5.

The fish arrived at my local station a few days later in excellent condition. After floating the polythene bags in the tank for about half an hour, I gradually mixed the water from the tank with the transport water, then released the fish into the aquarium. Once in their new quarters they became very lively seeming no worse for their long train journey. Close observation showed quite clearly the difference between the sexes. Both fish are a rusty red in colour, with the abdominal area greenish white in the female and more silvery in the male. There are three blue-black spots on the body, the largest spot being in the centre of the body. The second spot at the base of the anal fin is a definite spot in the male but the females show a bar of two small spots joined together. Some females do have two small separate spots although none of my fish showed this. The third spot is at the root of the caudal fin. Both the first and third spot show a quite bright band of gold encircling them in the male; this is much paler in the female. The dorsal and anal fins in both sexes show reddish with a black spot, again these are not so bright in the female who is plumper than her mate.

Several days passed until one morning I was about to switch on the lights over the tanks, having previously put on the centre light in the fish room, when I noticed two male *R. maculata* displaying to any female nearby. One female appeared interested and swam among the plants at the back of the tank. A male immediately followed and about an inch above the gravel began to shake. He then darted up to the

female and back to the gravel shaking in an S movement. Eventually the female was persuaded to join him and the two pressed close together side by side vibrating, the male's caudal fin slightly above and held tightly to the female's. A tiny clear egg sank slowly to the gravel.

As this had all happened very swiftly, I stayed watching and saw the same thing repeated many times over the gravel or above a plant leaf. There was never any attempt to lay the eggs in a definite arrangement nor was more than one egg expelled at any one time. Although I never saw the *Rasbora* eat any of their eggs or fry, events point to this happening.

About two weeks after watching this first spawning (and these little fish have spawned regularly every morning before the lights were put on over their tank). I found my first few fry, one at the surface, one in the plants at the side and one in the centre of the tank by the heater. A few days later five were counted. After this two disappeared and it was back to three. Had the tank been really thickly planted with plenty of dwarf plants to give a good cover to the base, I am sure many more babies would have survived. Not to be deterred I set up a small 12 in. × 10 in. × 10 in. plastic tank in a corner which gets no direct light, covered the base with gravel and filled it with half peat and half tap water. After some thought I decided not to use plants but the nylon mops I use to spawn my Killies. I put in four thick ones at each corner. This gave very good cover and the tank was heated to the same temperature as the 18 in., between 74°-75°F.

After separating the sexes and conditioning on a flake food, grindal and small white worms for a week, I placed all 10 *Rasbora maculata* in the breeding tank and waited. They took about two days to settle and as they spawn a few eggs each day I decided to give them three days and then remove them.

The fry appeared a few at a time and I fed a liquid food for egg-layers for the first week or so, even after new hatched brine shrimp were fed to the older ones. Altogether 80 fry were counted when transferring to larger quarters three weeks later and 73 were raised to maturity.



Above: *Ambulia*

Below: *Cabomba*

SOIL FOR HEALTHY PLANTS

Written & Illustrated by Bill Simms

MANY YEARS AGO I remember reading about the densely planted tropical aquariums in use on the Continent, and because I realised that fish always did better when lots of plants were present I began to use larger quantities of plants in my own tanks. The ideal density of planting was such that at any one time less than half the fish were visible, for the rest were hidden while exploring the plants—browsing on the infusorians there.

For a time the plants flourished, but then I began to have troubles. Many of them appeared to lose heart, for they either stood still, or even declined. It seemed to me, with a gardening background, that the plants were suffering from a lack of nourishment, that there were not enough fish present to produce sufficient nutrients, although from the point of view of overcrowding there were plenty of fish.

I added plant foods for a period, and there was a slight improvement, but not to the degree I wanted so I determined to explore the result of placing soil and peat under the gravel. It began to seem that the couple of inches of gravel used was inadequate.

All my tanks were 12 in. deep, and to use about 4 in. of soil, peat, and gravel would leave only 8 in. of water for plants and fish. So I changed them, one by one as I progressed, for tanks that were 15 in. deep. I had in mind that the light I was using was only really effective to a depth of 10-12 in.

The amount of light passing through water as it becomes deeper lessens rapidly, and although—through watching underwater television—we all know

that this is so, few of us realise that the process starts at the water surface, and has an effect on plant life even a few inches down. Light-loving plants such as *Cabomba* need to be near the surface to collect the





Above: *Cryptocoryne beckettii*

Right: *C. griffithii*

beneficial rays they need, while *Cryptocoryne* will thrive better in water a foot deep.

Therefore I always aim to restrict water depth to a foot or less if I wish plants to thrive—and of course to give them the light conditions that suit them best. With the new 15 in. tanks I allowed 4 in. of depth for the planting medium, and tried 2 in. of soil, 1 in. of peat, and 1 in. of gravel to prevent water pollution. At various times I tried different proportions, but none were better.

The soil used for the bottom layer was garden loam, taken from my vegetable plot. It was slightly damp, and not pressed down, so that water could penetrate easily, and no bubbles would be trapped. The peat was a granulated garden kind, and it was essential to dampen this for a day or two before use.

After the gravel had been laid on top, water was introduced on to a saucer laid on the bottom, and the

tank filled. It is my practice to plant always under water for I find then that it is easier to make the plants take their final position, and any that may not have obtained a firm grip, and so could float up, are noticed at once.

A major mechanical difficulty when planting was to prevent the different layers from mingling. Of course, there was bound to be a little of this, but I restricted it by scraping the gravel to one side, and planting in the peat. Then the gravel was returned to the hollow, and any small pieces of peat that had floated up were removed with a net. This in most cases gave a tidy result, without the water becoming dirty. Beginners should note that planting in only an inch of water, which may at first seem easier, brings problems as water is introduced, for the longer plants tangle, and some pull others out of the planting medium.

The kinds of plants used depends on the likes of the planter, but they should all be placed where they get the light they need. *Cabomba*, for instance, I always place on a raised terrace—usually at one side of the tank. If it is intended to have one or two raised terraces the retaining wall of rock should be built—on a half-inch layer of soil—before the rest of the planting medium is added. The extra depth is made up with soil, using an inch of peat and an inch of gravel to cover it up.

With a water depth of eleven inches over the lower portion, and about eight inches over the terraces, it is possible to select the best place for each kind of plant. *Cabomba*, *Ambulia*, *Ludwigia*, and *Hygrophila* should always be given priority of light, and when they get their roots down into the soil the resultant growth will

Continued on page 363



THE AQUARIST

A POPULAR MALAWI CICHLID

Written and illustrated by Jørgen Hansen and Pamela Stuart

Labeotropheus fuelleborni is one of the many beautiful M'buna mouthbrooders from Lake Malawi. This cichlid was introduced to Europe in the middle of the nineteen-sixties and has been popular amongst cichlid fanciers ever since.

The genus *Labeotropheus* was described by Ahl in 1927 as composing two species, namely *L. fuelleborni* and *L. curvirostris*, the difference between these two supposedly being the form of the snout. In 1935, however, Dr. E. Trewavas came to the conclusion that this difference was of no taxonomic significance and that the two species were, in fact, synonymous.

In an article published in 1956, Fryer described how a survey conducted in Lake Malawi (Nyasa) showed that many of the caught *L. fuelleborni* specimens were divergent with regard to body depth and length. On this basis he divided the genus into two species, *L. fuelleborni* and *L. trewavasae*, of which the latter is the more shallow-bodied and less common.

The following description of *L. fuelleborni* is taken from the aforementioned article of Fryer.

(1) Standard length is 2.54 to 2.94 times the maximal depth measured in specimens with a total length of from 4.8 to 15 cm.

(2) The head comprises between 29.6 and 34 per cent of the standard length.

(3) The snout has an evenly curved profile with a thickening which protrudes over the mouth.

(4) The snout length comprises 32.3 to 42.8 per cent of the head length.

(5) The eye diameter is 23.9 to 30.4 per cent of the head length.

(6) Interorbital width is 29 to 42 per cent of the head length, the width increasing as the fish increases in size.

(7) The mouth is very broad and ventrally located.

(8) Each jaw contains 6 or 7 rows of tricuspid teeth, of which the outermost row is by far the largest. There are at least 70 teeth in the outermost series of the upper jaw. At each side of the upper jaw there is a series of 6 to 9 enlarged conical teeth.

(9) The scales are ctenoid. The lateral line is interrupted and there are from 31-33 scales in a longitudinal series.

(10) The fin ray count is as follows:

	Spiny rays	Soft rays
Dorsal	XVI-XVIII	7-10
Anal	III	7-8 (9)

(11) The female's left ovary is atrophied. Both testes are functional.

L. fuelleborni is polymorph, as different colour variations of both male and female are to be found.



Male *L. fuelleborni* gnawing algae from the side of a tank. Note that the fish forms an angle of about 45° with the tank side.



Left: A blue male specimen (Variation B). Note the clear egg spots on the anal fin

Below: Female specimen showing broad mouth

We have so far personally encountered the following variations:

(1) Male. Variation B. The basic colouring is blue with an indication of 6-8 darker perpendicular bands. When in spawning mood the colour is a luminous blue. The rear area of the dorsal fin is orange; at the rear edge is to be found two to three large orange spots reminiscent of egg spots. The caudal fin is also edged with orange. The ventral fins are completely orange and strongly luminous when the fish is in spawning mood.

(2) Male. Yellow variation. The basic colouring is yellowish with a faint indication of 6-8 darker perpendicular bands. Three to four yellowish-orange egg spots about 3-4 mm. in diameter are to be found on the anal fin. This variation is seldom to be found in trade.

(3) Female. Variation B. The basic colouring is a dull blue-grey with an indication of 6-8 perpendicular darker bands.

(4) Female. Variation OB. The basic colouring is orange which is studded with dark spots of about 3 mm. in diameter and moreover with innumerable both red and light blue spots of a diameter of 1 mm. and less.

When the fish is afraid the colouring is very faint and dull except in the OB variation.

L. fuelleborni is endemic to Lake Malawi where it keeps to the rocky coast, and has been recorded from all shores of the lake, and from Likoma and Benji Islands.

The M'buna group, to which *L. fuelleborni* belongs, comprises over 30 species, with new species constantly being discovered. These cichlids live mostly on algae. *L. fuelleborni* feeds on *Calothrix* (two species of blue-green algae) when available, and epilithic algae or *Auftauchs*, which is the thin layer of algae covering the rocks. *L. fuelleborni* when feeding takes up a position at an angle of 45 degrees in relation to the rock surface, and thereafter undertakes a long series of nibbles, twelve or more, before the mouth is removed from the rock. It seems unlikely that small invertebrates which live amongst the algae should escape being devoured although analysis of stomach contents rarely reveals such invertebrates. However, the distance between the conical teeth at each side of the upper jaw is just small enough to retain these items.

We have in our M'buna tank besides *L. fuelleborni*, *Pseudotropheus auratus*, *P. williamsi*, *P. zebra*, *P. livingstoni* and *P. microstoma*, in all 25 fish. Along the back and sides of the 200 litre tank an imitation rocky coast forming innumerable caves has been built with large pieces of coral. The tank has permanent aeration and an Eheim power filter keeps the water



clear. We feed mostly with dry food in the winter providing, however, mosquito larvae and *Tubifex* when available, and in the summer more frequently with this live food. A supplement of algae taken from other tanks is also given.

L. fuelleborni breeds in the same way as the other M'buna cichlids; it is, like the other members of the group, polygamous and one male can well be kept together with several females. Generally speaking there should always be more females than males as otherwise the males tend to fight. After varied feeding and a change of water you will often observe that some of the females have their mouths full of yellowish eggs about 2-3 mm. in diameter. Spawning occurs as a rule over a stone or else over a hollow dug by the male in the gravel. The pair circle around one another, snout against tail, for up to half an hour before the eggs appear. The female then spins around and collects the eggs into her mouth, and tries, apparently, also to collect the eggspots on the male's anal fin. At this point the

male squirts his sperm out into the water, and in this way the eggs in the female's mouth are fertilised. Large females can produce up to 50 eggs.

Some females can conceal the bulge in their throat when carrying eggs but you can easily see by their behaviour if they are with eggs. They will always keep to themselves, as far as possible away from the other fish in the tank, and will refuse to eat. If you wish to save the fry you should either remove the other fish from the tank or simply place the female in isolation in a tank of about 50 litres with good aeration and containing some hiding-places so that she feels secure and does not swallow the eggs. After the course of 22-30 days, according to the prevailing temperature, the female will, if all goes well, spit out the fry which at this point will be of an ordinary brown colouring and have a terminal mouth. Only when the fish have grown to about 5-6 cm. in length will they develop the adult's characteristic ventral mouth and body colouring. The fry grow well on brine shrimp in the first month.

SOIL FOR HEALTHY PLANTS

continued from page 360

be such that stems with large, closely-spaced leaves will spread along the water surface. Some of these are naturally bog plants, and respond well to being nearer the surface.

Close to the terrace walls, where they will be shaded by the exuberant growth of the light-lovers, *Cryptocorynes* of various kinds will do well, forming dense colonies as soon as their roots become established in the soil. A medium light suits *Echinodorus* (Amazon Sword Plants) as well, so these can be set away from the terrace walls on the bottom, and will thrive there sufficiently to produce hosts of young ones. Incidentally, do not transplant any of these youngsters until they have made plenty of roots.

There are plenty of *Vallisneria* and *Sagittaria* species suitable for planting in soil, and all of them do well with medium light, so could be used for the bottom of the tank rear. Plant these without burying their crown—in the gravel only—and soon they will send roots down into the soil. Whichever plants you use they will soon show a great improvement when given the benefit of these improved conditions, but be careful that you do not foul the water with the soil.

Right: *Echinodorus radicans*



Answer to: *One of the Family*
MARbled CICHlid



Snails Wanted

I am interested in obtaining a number of different varieties of snails—in particular:

- Australian Red
- Red Ramshorn (*Planorbis corneus*)
- Colombian Ramshorn (*Marisa rotula*)
- Paper-shelled Snail
- Japanese Live-bearing Snail.

Years ago all of these would have been readily available at the local pet shops, but they seemed to have disappeared and I wonder if you could help me, through the medium of your pages, to contact anyone who stills has any or all of these species.

Yours faithfully,
D. E. BATTLE,
47 Cobden Street,
Darlington,
Co. Durham.

Opinionated Thermometers

The letter from Mr. S. J. Baker under the above heading in your September issue should be no surprise to aquarists.

I have over a dozen thermometers bought from aquarist shops, some English, some Japanese, and there is only one which is accurate to two degrees Fahrenheit. Between them there is a variation of ten degrees.

There is one solution. Go to a good photographic dealer and buy a Paterson Certified Thermometer. These are guaranteed $\pm \frac{1}{2}$ degree. For a little more one can be obtained $\pm \frac{1}{4}$ degree. Check the tank thermometers with this, and put a small label on the tank containing the appropriate thermometer with say $+3$ or -2 , whatever the difference may be. Add or subtract this figure from the thermometer reading. Keeping the "master" instrument in its case, and look after it.

Another method is to persuade manufacturers to supply accurate instruments. But that is wishful thinking.

Yours faithfully,
HUGH PARRISH,
General Secretary,
Federation of British Aquatic Societies,
18 The Barons,
St. Margarets, Twickenham,
Middlesex TW1 2AP.

Licence Required for Dangerous Fish

Dear Sir,

Recent press publicity implies that some fish species will be on the list of animals required to be licenced and registered under the Dangerous Wild Animals Act (1976). Is this the case?

I can understand official concern about venomous reptiles and insects, and mammals and birds which are large enough to inflict physical injuries on people. A condition of being granted a licence to keep listed animals is that premises where they are kept shall be liable to inspection by local authority representatives. This, with security in mind, is reasonable, but I cannot imagine how it would be possible to keep fishes insecurely. Can any reader?

The only threat to public safety posed by fishes is where hands, presumably uninvited, are poked into aquaria, rendering their owners liable to being bitten, poisoned or electrocuted.

Unfortunately, the local authority in my home area does not yet have details of the Act, although it became law on 22nd October. Officials have only been able to advise me to believe what I read about it in the papers and state that, following previous legislation affecting them, it has often been several months before they found out what it was all about.

Is *The Aquarist* able to publish any details? If so, can you attempt to find out the reasoning behind the inclusion of fishes?

Yours faithfully,
R. S. HOLMES,
Ilfracombe and District A.S.

We have little hope of finding any reasoning but will endeavour to unearth more details.—(Ed.)

PRESS RELEASE

Newly appointed to the staff of The Jaynor Organisation which is incorporated with Barry M. Austin & Co., is Vic Swabey. Vic was exhibiting the new Diatomic Filters at the recent British Aquarists Festival held at Belle Vue, Manchester.

Demonstrating the filter, Vic stated that it has eye appeal, plus a basic functional design of all-plastic construction and an approved economical motor which is whisper quiet in operation coupled with powerful ceramic magnetic drive. Also included are recirculating valves which ensure no filter powder can enter the aquarium, along with the optional use of two inlets. This represents the most advanced form of diatomaceous filtration available.

Callichthys callichthys

Will the reader from Reading who submitted an article on breeding the above species please get in touch with the Editor as soon as possible.

THE HYDRA

IS IT INDESTRUCTIBLE?

Written and illustrated by Huw Collingbourne



DEPENDING on your point of view, the freshwater hydra may prove to be one of the most hated of aquarium pests or one of the most intriguing aquatic phenomenon.

I have little doubt that the great majority of aquarists will have little sympathy for the latter opinion and will waste no time in attempting to exterminate any hydra which finds its way into an aquarium.

Nevertheless, I admit to the unpopular prejudice of favouring the hydra to practically any of the fishes which it may devour. However, I realise that this view is far from general and therefore I feel obliged, in this article, to discuss the hydra as though it were an undesirable alien, though I hope the reader will forgive me if I occasionally deviate from my plan of criticism in order to highlight some of the extraordinary attributes of the creature.

There is an ancient and revered mythology amongst aquarists which credits the hydra as a virtually indestructible beast and tales are told of infestations of hydra surviving all manner of drastic methods of elimination, such as treating a hydra-colonised aquarium with sulphuric acid or household bleach only to discover that not only do the little creatures manage to live through it, but actually thrive.

Unfortunately this sort of folklore, colourful though it be, only serves to misdirect our attention; for if, in reality, the hydra is unlikely to survive the treatment detailed above, its actual ability at survival is perhaps more remarkable than that of almost any other animal or plant on earth.

Left: Hydra with well-formed bud

Much of what we now know about the hydra results from the research of the eighteenth century Swiss naturalist, Abraham Trembley who, having collected freshwater plants from a ditch, was intrigued by the flowers upon them for, when the jar of water in which they were kept was shaken, the flowers disappeared, leaving only very small green lumps in their place. After a time, however, and only if left undisturbed, the green lumps would extend and the "flowers" would seem to blossom once again.

Trembley was soon to discover that these were no ordinary flowers and were indeed quite separate things from the plants to which they were attached. However, it took three years of experiment to discover whether the hydra was an animal or a plant. Its green colouring suggested that it was a plant, but there were other far more remarkable qualities which seemed to confirm this belief.

When a hydra is cut in two, both sections will grow into complete new adult hydra. In Trembley's time, the ability of regeneration was thought to be exclusive to plants, but even now the hydra's capability of total regeneration is known to be extremely rare.

Experimentation has shown that a hydra which is cut into two hundred pieces, each less than 0.2mm. in length, will form two hundred complete new beings.

Quite as remarkable is its ability to alter its own cell structure. This was demonstrated in an early experiment when a hydra was literally turned inside out, its stomach wall being pulled out through its mouth aperture rather in the manner that one might turn a sock inside out (albeit with greater ease, I imagine). Incredibly the hydra was able to reverse itself—the cells on the inside migrated to the outside and those outside moved inside!

One would imagine that the hydra has so much going for it that conventional reproduction would be obsolete. This is not the case, however, for the hydra reproduces itself in two different ways (not counting the regeneration of any detached particles).

Most commonly it reproduces asexually, forming buds which eventually break away from the "parent" animal in the same way that many sea-anemones reproduce (the hydra is a relative of the sea-anemone).

From time to time the hydra may reproduce sexually, though this does not imply that any more than one animal need be involved.

Before reproducing in this way, the animal will develop swellings on its body. These swellings contain sperm, and another swelling on its body contains an ovum. A single animal is able to fertilize itself in this way.

The interested aquarist may choose to observe hydra in a jar of freshwater. In addition to simply observing their reproduction, and perhaps conducting some of the less adventurous experiments detailed

earlier, one may be interested to observe the hydra's unusual method of motion.

Anyone who has ever kept sea-anemones will know that, contrary to general belief, they are far from sedentary beings and will move (slowly, I admit) from rock to rock, sometimes burying themselves out of sight in the substrate or attaching themselves to the centre of the front glass of the aquarium.

The hydra is yet more active and its mode of movement is rather more striking. Bending from the vertical position, it will attach its oral disc to the substrate, releasing its grip with its basal disc. Then it contracts its body and reattaches its base next to the mouth and tentacles. The oral disc releases its hold, the hydra extends its body once more and prepares to take a second step.

In a jar or aquarium, hydra may be encouraged to travel from place to place by moving the light source, which they will follow.

There are three species of hydra which the aquarist may come into contact with. These are the green hydra (*Chlorohydra viridissima*) which owes its colour to algal cells living in its tissue—the brown hydra (*Hydra vulgaris*), which is similar in appearance to the green hydra, and they are both between 1 cm. and 2 cms. in length—and finally, the grey hydra (*H. oligactis*), whose size varies greatly according to food consumption and the degree of contraction; its contraction and extension abilities are remarkable, and the size of a single individual has been recorded to vary between 25 cms. and less than 5 mms.! The grey hydra, unlike the other varieties, is able to engulf quite large prey, and having done so tends to resemble a tiny but grotesquely swollen balloon.

The green or the brown hydra are the types which are most likely to find their way into aquaria and they may be introduced unwittingly with water plants or with live food, and are especially common in bags of *daphnia*.

They are quite harmless to large fishes and are only capable of eating tiny creatures such as *daphnia* or the very tiniest of young fish fry.

Despite the hydra's terrifying effective survival and reproductive capabilities, there are several tried and tested ways of getting rid of them. Several types of gourami will eat hydra, especially when other foods are restricted or eliminated. Three-spot gouramis, blue gouramis and pearl or leeri gouramis are traditionally employed in this way.

Hydra are very susceptible to copper poisoning and a few copper coins or some copper wire hung in the tank water will normally prove sufficient to kill hydra. Immediately this is accomplished about half of the aquarium water should be replaced as copper is harmful to fish too—though normally at a much higher degree of concentration than is needed to kill invertebrates.

MOSQUITOES

Written & Illustrated by David Wareham

AS CARRIERS of disease mosquitoes have earned themselves the reputation of being probably the world's most dangerous animal, killing well over three quarters of a million people every year. Of the two thousand or more different species, which are distributed throughout the world, only a small number are vectors of dreaded diseases such as dengue fever, yellow fever, elephantiasis and malaria. Of these, some are intermediate hosts for the disease

may have anything up to ten. The number of eggs produced by a female also varies greatly, the largest amounts being laid by those inhabiting the tropics.

Notable successes in the fight against the malaria mosquitoes are now apparent and their scourge, which for hundreds of years made vast tracts of fertile land uninhabitable, is now being overcome. The Roman Campagna is rapidly becoming the



Culex pipiens

organisms, completing their development in the animals which are bitten, while others are simply mechanical carriers.

In attempts to combat these tortuous insects, a vast number of intensive studies have been carried out in many countries and, although a great deal is still to be learned, the disease-bearing mosquitoes are among the most investigated creatures in the animal kingdom.

The business of controlling the mosquito is a complex one due to the differing habits of many species. Some of the malaria mosquitoes, for instance, bite only animals, while others include man. These and certain other characteristics may change quite dramatically however, from region to region. Climate and temperature are two of the factors which both play an important part in the activities of the mosquito. In the north they have from one to three generations in a year and in the south they

granary of Italy, and the Panama Canal zone, which evaporated the fortunes of De Lessops and where some twenty thousand construction workers lost their lives, is now a winter health resort.

The majority of female mosquitoes require a meal of blood in order that their eggs can mature. Different species have different blood-hosts, ranging from birds and mammals to reptiles, amphibians, certain fish and even other insects. Members of the genus *Aedes* live in the burrows of crabs and feed on their blood, whereas the infamous yellow fever mosquito feeds almost exclusively on the blood of man. The basic and usual food of mosquitoes is, however, the vegetable fluids from flowers, leaves and bark, etc. The males of most species do not bite and drink only water and occasionally nectar.

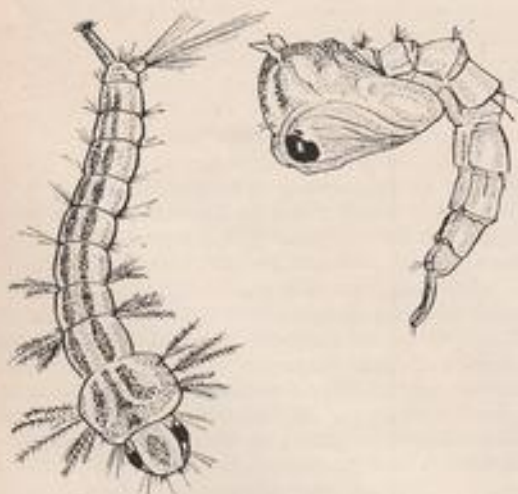
Female mosquitoes deposit their boat-shaped eggs just about anywhere where there is sufficient water to contain the developing larvae. Each species

has a preferred habitat for its eggs and larvae and sites range from hoof marks in a muddy road, crevices in the bark of a tree, tidal pools, old discarded containers and even inside certain carnivorous plants. They are laid either singly or in 'rafts' upon the water's surface. Species living in the far north lay their eggs in the summer in dried-up pools. These then remain dormant for as long as nine months and in the winter are often frozen solid.

The majority of mosquito larvae hang head downwards beneath the surface and breathe through a tube which stretches up to the surface from the tip of the tail. The larvae of the fever mosquito, *Anopheles*, however, lie horizontally, secured to the surface film by special bristles and warts, and breathing means of a respiratory shell from which extend the two main air tubes of the body.

Their food is made up of micro-organisms and algae that are drawn towards them by means of a current surrounding the larvae and brought about by two large, hairy fans which beat in opposition, on the outer mouthparts. It has been estimated that a single larva may filter two quarts of water a day in its process of feeding.

Pupation takes place at the fourth moult, and although slightly less mobile than the larvae, the pupae are nevertheless fairly active and swim with a pair of transparent, lobster-like fins at the tail. Like the larvae they breathe at the surface through two small trumpet-like respiratory tubes. Mos-



Larva and pupa at water surface

quitoes are so numerous in some areas that their pupae frequently cover whole ponds with a black carpet of wagging, undulating bodies.

Before emerging as an adult insect the pupal

case swells with air which is drawn in via the respiratory tubes. This causes the pupa to rise a little above the surface of the water where it splits open. The fully developed mosquito takes in a breath of air, frees itself from the floating pupal case and flies off into the air. Some species run over the water searching for an emerging female and on finding one mate with her, sometimes actually assisting her to emerge by helping to release the pupal case.

The adults are very slender insects with six piercing daggers in the mouth and, enclosing these in the form of a sheath, a proboscis with which the blood is absorbed. The piercing organs are extremely sharp. Some have saw-toothed edges and others have tips as smooth as stiletos. When they puncture the flesh, the insect's saliva flows immediately into the wound and the blood imbibed in a continuous stream by the pumping action of the digestive tube.

Their palpi are stiff and turned upwards and the antennae of the males densely feathered, whereas those of the females have just a few hairs branching from each segment. The wings are usually bordered along their veins with scales.

Of the two thousand or so species which inhabit the world, some fifty species occur in Britain, all of which are small, except for *Theobaldia annulata* which is in fact one of the largest of all mosquitoes. It is easily distinguished by the striking black and white bands on its legs. Although it does not appear to transmit any diseases, its bite is still painful and frequently results in severe swelling and blisters. Our commonest mosquito, particularly in buildings, is *Culex pipiens*. It is quite harmless and rarely bites man. We have four species which are capable of carrying malaria and the commonest of these is *Anopheles maculipennis*. Although it is fairly abundant in some areas malaria is rare here. It seems to occur mainly in the vicinity of cattle sheds, where at night it sucks the blood of the sleeping animals, usually from their eyelids.

By far the easiest method of recognising the dangerous *Anopheles* from the irritating but harmless *Culex* is to examine the positions that they assume when at rest. *Anopheles* has an angular resting posture and the body is not parallel to the object on which it is resting, but elevated obliquely toward the rear. The almost horizontal position of the piercing mouth parts and the raised hind legs indicate that it is *Culex*.

It is possible to destroy mosquito larvae and pupae by spreading oil on the surface of the water in which they live, where it enters the insects' breathing tubes. Although this method is one of the most effective ways of controlling these pests, the most important destroyers of the mosquito hordes are other water insects (and in particular the larvae of aquatic beetles) along with amphibians and fish.

BOOK REVIEW

The Complete Home Aquarium by Hans J. Mayland. Published by Ward Lock at £4.95.

Originally published in West Germany, this English edition has been translated by Gwynne Vevers, Curator of the Aquarium, Zoological Society of London.

The colour photographs with which the book is copiously illustrated are of a very high quality and can be appreciated fully when examining, for example, a full page (8 in. x 10 in.), subject-filling study of two *Brachydanio albolineatus* specimens. Line drawings of plants in a comprehensive chapter on Living Communities in the Aquarium are also of excellent quality.

Comprising two main parts dealing respectively with the Freshwater Aquarium and the Marine Aquarium, chapters cover Aquarium Tanks and Equipment, Setting up the Aquarium and Living Communities (Freshwater Section) while the Marine section embraces Tanks and Equipment, Care of the Fish, Diseases of Coral Fishes, and Invertebrates.

A comprehensive array of species are dealt with under tropical fish and includes a good selection of catfishes, killifishes and cichlids with discus and Great Lake cichlids prominently featured and exemplified in colour plates by such gaudy beauties as *Haplochromis eucialis* and *Aulonocara nyassae*.

In his introduction, the author explains that all river waters are soft to begin with as they stem from precipitation (rain or snow) and he cites the Amazon basin as containing the softest water known. Gathering its waters as it dies from the highlands of Guyana in the North, of the Mato Grosso in the South and the Colchillera chain in the West, the Amazon basin receives them after they have followed courses through mineral deficient territory. African waters, on the other hand, and especially those of the lakes in particular, are markedly harder. As most aquarists appreciate, a knowledge of habitat conditions of fish species is essential to the planning of a congenial aquarium set-up and breeding success often depends entirely upon the water quality being as near that of the species' home waters as can be achieved. In this context the pH value, too, plays an important role and the author makes an interesting comparison in pH between various African lakes. River Zaire with a pH of 6.5 is no great distance from Lake Tanganyika whose water has a pH of 8.8 while the soda Lake Magadi has a pH of 11.5 and a specific gravity of 1.015-30 (sea water is about 1.025) but contains fish, *Tilapia grahami* being quoted.

Fishes featured in the Marine section range from *Amphiprion* and *Dascyllus* species to the regal angels

species of such genera as *Euxiphopops*, *Pomacanthus* and *Arusetti*.

Under Marine Invertebrates we have the usual array of anemones, urchins, prawns, cowries and sea-cucumbers which display a spectrum of colourful liveries making them irresistible "furnishings" for a marine set-up but it is pointed out that they are often more sensitive to the water quality than are the fishes.

The chapter on Tanks and Equipment follows the customary pattern and deals with filtration, protein skimmers, ozonizers, ultra-violet radiation and all the gadgetry stock-in-trade of the marine aquarist. Care of the Fish which follows supplies, concisely, information on oodinium, Cryptocarium disease, Lymphocystis and swimbladder trouble.

A well-designed, attractive and useful book which would make an ideal present for an "intermediate" aquarist.

The Observer's Book of Tropical Fish by Neil Wainwright. Published by Fredk. Warne at 90p.

This indispensable series of pocket size books is familiar to most people, many of whom will remember, with affection, carrying one of them around as a youngster when, perhaps, his current interest was in butterflies, wild birds, insects or wild flowers. In pre-war days they were 5/- (25p) each and at 90p today they have not suffered so severely from inflation as have most things.

Intended primarily as an aid to identifying species of tropical fish and well illustrated to this end with very good coloured drawings by Baz East, each species is given adequate coverage in the way of description, general needs and breeding requirements. The introduction is especially useful to the beginner for whom this handy-sized companion would make a worthwhile present.

The Home Aquarium Book by W. Simister. Published by David & Charles at £2.95.

The author will be known to readers of *The Aquarist* and many will have enjoyed his scraper-board drawings which have appeared within these pages. This book, aimed at the beginner, is illustrated on every other page so that drawings alternate with text which makes for an attractive layout. Taking the reader from the empty tank, through the furnishing and stocking, the writer then covers goldfish and coldwater species. In the chapter entitled Starting with Tropicals, heaters and thermostats are discussed and plant species described in preparation for what follows in Chapter 6 where some of the most popular of tropical fish are covered.

The Cold Marine Aquarium chapter describes a number of fishes and invertebrates to be found around our shores and which can be kept by the newcomer to marine aquaria who wishes to progress gradually to the realms of tropical marine keeping.



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 5th of the month preceding the month of publication.

THE North West Lancs. (Manchester Section) of the **Fancy Guppy Association** recently participated in two major Open Shows; the first was their own Annual Open Show which was held at Preston and immediately afterwards was the International Österreichische Guppyschau in Vienna.

Two European clubs had been invited to participate in the North West show on a reciprocal basis these being the Deutschen Guppy Federation from Berlin and the Österreichische Guppy Gesellschaft from Vienna. Both clubs sent entries and, as agreed, included females of different strains. In all over ninety fish were sent by fourteen Germans and Austrian enthusiasts.

The North West Show attracted 171 entries covering thirty-five guppy classes and the show was very well attended with F.G.A. members travelling from London in the south and Edinburgh in the north. It was estimated that some 200 people were present during the afternoon. The major awards were won as follows: Best in Show, Best Male, Aquarist Gold Pin, Best Short tail Exhibit went to A. Charlton (N.W.L.M.) with a Topsworld which gained 80 points; Best Breeders was won by J. Hutchings (N.W.L.M.) with a team of natural tail females and the Best Female award was won by R. Early (South London) with a Wedgetail female. M. Doyle (N.W.L.M.) won the Best Junior with a Delta, the Short Dorsal Veil Trophy going to H. Vinall (South London) and Fantail Trophy to Robert Kratochwill (O.G.G.).

Five Members sent twelve teams of three matched males to Austria and two won classes, P. Jinks, Birmingham with Pintails and J. Hutchings with Lyretails and Albino Females. He also gained two seconds. This was a good result as there were 480 fish on show from seven countries for the week the show lasted. Members exhibited at the Berlin International Show in September and hope to repeat the venture again next year. Anyone living in the north who is interested in joining the Section is invited to ring J. Hutchings at Broughton (Preston) 864344.

THERE was a record entry of over nine hundred fish for the **Newbury and District A.S.** open show. The Best Fish in Show award went to M. Wear of Southampton with a Beta Breden in Class E. He also won the F.B.A.S. Perpetual Trophy. The following were the results—Class A: 1, C. Howe (Newbury); 2, Mrs. G. Barrett (Newbury); 3, Mrs. G. Rushbrook (Reading); 4, Mrs. Richmond (Kingston). Class B: 1, R. Adams (Salisbury); 2, J. Eddleston (Salisbury); 3, E. and T. Tester (Mid-Sussex); 4, W. Heather (Bournemouth). Class B-1: Mr. and Mrs. Bebb (Peterfield); 2, M. and Mrs. Yates (Kingston); 3, D. Mackay (Kingston); 4, J. Hathaway (Basingstoke). Class C: 1, C.

Turner (Independent); 2, R. Cox (High Wycombe); 3, H. Tall (Salisbury); 4, P. Rayner (Newbury). Class Cb: 1, T. Burvill (Basingstoke); 2, H. Chaplin (Basingstoke); 3, T. Fraser (Basingstoke); 4, F. Cripps (Newbury). Class C-1: C. J. Sykes (C.A.G.B.); 2, C. Howe (Newbury); 3, M. Dore (Reading); 4, A. C. Tall (Salisbury). Class D: 1, D. Sheridan (Newbury); 2, D. Luker (Newbury); 3, F. Cripps (Newbury); 4, L. Lyford (Newbury). Class D-1: M. Strange (Basingstoke); 2, J. Cripps (Newbury); 3, Mr. and Mrs. Yates (Peterfield); 4, W. West (Salisbury). Class D-2: 1 and 4, W. Knight (Gosport); 2, S. Pitcher (Salisbury); 3, D. Eddleston (Salisbury). Class D-3: 1, M. Gunn (Gosport); 2, W. Knight (Gosport); 3, D. Luker (Newbury); 4, Mr. Brown (Southampton). Class E: 1, C. and J. Richards (Sudbury); 2, K. Connelly (Gosport); 3, A. R. Fisher (Newbury); 4, Mr. and Mrs. Shirley (Godalming). Class E-1: A. Wear (Southampton); 2, Mr. and Mrs. Bebb (Bournemouth); 3, R. Adams (Salisbury); 4, C. Howe (Newbury). Class F: 1, G. Sandford (Reigate and Redhill); 2, K. Connelly (Gosport); 3, M. Hulford (Newbury); 4, A. Wear (Southampton). Class G: 1, Mr. M. Nethersell (Riverside); 2, C. J. Sykes (C.A.G.B.); 3, P. and L. Hills (Aylesbury); 4, R. Adams (Salisbury). Class H: 1, P. Rushbrooke (Reading); 2 and 4, Mrs. M. Nethersell (Riverside); 3, B. Bryden (Aylesbury). Class J: 1, Mr. and Mrs. Bebb (Bournemouth); 2, M. Chaplin (Basingstoke); 3, J. Hathaway (Basingstoke); 4, D. and L. Hills (Aylesbury). Class K: 1, P. Moye (Sudbury); 2, J. Jackson (Basingstoke); 3, I. Lecky (Basingstoke); 4, C. and J. Richards (Sudbury). Class L: 1, G. Sandford (Reigate and Redhill); 2, C. Turner (Independent); 3 and 4, J. Hathaway (Basingstoke). Class M: 1, K. Connelly (Gosport); 2, D. Sheridan (Newbury); 3, V. Allen (Newbury); 4, D. Parry (Gloucester). Class M-1: K. Connelly (Gosport); 2, P. and L. Hills (Sudbury); 3, C. Turner (Independent); 4, Mr. Brown (Southampton). Class N-BM: 1, C. and J. Richards (Sudbury); 2, B. Bryden (Aylesbury); 3, C. Turner (Independent); 4, P. Rushbrooke (Reading). Class N-OT: 1, M. Strange (Basingstoke); 2, P. Fitchett (Naïssa); 3, M. Noronha (Orpington); 4, R. Adams (Salisbury). Class O: 1, A. Noronha (Orpington); 2, P. and L. Hills (Aylesbury); 3, K. Connelly (Gosport); 4, Mrs. Jupe (Gosport). Class P: 1 and 2, F. Cripps (Newbury); 3, E. and T. Tester (Mid-Sussex); 4, Mr. and Mrs. Bebb (Bournemouth) and Miss S. Evans (Newbury). Class Q: 1 and 4, A. Noronha (Orpington); 2, Mr. and Mrs. Bebb (Bournemouth); 3, D. Parry (Gloucester). Class R: 1, D. Luker (Newbury); 2 and 3, A. Noronha (Orpington); 4, P. Mave (Sudbury). Class S: 1, Mrs. M. Nethersell (Riverside); 2, E. and T. Tester (Mid-Sussex); 3, Mr. and Mrs. Shirley (Godalming); 4, B. Brown (Leamington). Class T: 1 and 4, Mr. and Mrs. Dibble (Naïssa); 2, A. Noronha (Orpington); 3, T. Skeet (Croydon). Class X-B-M: 1, M. Strange (Basingstoke); 2, B. Young (Newbury); 3, K. Connelly (Gosport); 4, D. Ellis (Aylesbury). Class X-O-T: 1, M. Strange (Basingstoke); 2 and 3, A. Noronha (Orpington); 4, W. West (Salisbury). Class X-UW: 1 and 2, T. Longstaff (Kingston); 3 and 4, F. Pinder (Independent). Class Ud: 1 and 2, L. Merrinot (New Forest); 3, F. Pinder (Gosport); 4, Mrs. Sower (Newbury). Class Ubc: 1 and 3, C. Rupert, jr. (Port

Talbot); 2, J. Pollard (Kingston); 4, J. Lyford (Newbury). Class V: 1 and 4, C. Rupert, jr. (Port Talbot); 2 and 3, T. Longstaff (Kingston). Class W: 1, I. Hughes (Southampton); 2, W. West (Salisbury); 3, G. and D. Arnold (Gosport); 4, J. Jupe (Gosport). Class Y: 1, Mrs. Strange (Basingstoke); 2, Mrs. G. Barrett (Newbury). Class Z: 1, P. Merrin (Reading); 2, H. Chaplin (Basingstoke); 3, J. Jackson (Basingstoke); 4, K. Connelly (Gosport). Special Awards: F.B.A.S. Perpetual Trophy, M. Wear (Southampton); Highest pointed visiting club, Basingstoke; Highest pointed junior, C. Rupert (Port Talbot); Highest pointed Newbury junior, R. Decaste (Newbury); Highest pointed Newbury member, David Luker (Newbury).

THE Village Bar A.S. open show will take place at the Village Bar, Garden House Schooner Inn, Hagley Road, Edgbaston, Birmingham on 19th December and will feature the native fish championship, a unique fish racing event and an inter-society match. Due to time restrictions benching must take place between 12 noon and 12.30 p.m. prompt. The show is fully licensed. The society also held a disco/buffet in October which was well attended and attracted some new members.

DESPITE difficulties caused by the withdrawal of the usual meeting room at very short notice the **Southampton A.S.** regular monthly meetings have been held in a small room at the Central Swimming Baths. This room is however not suitable for inter-club events, and after much searching, the St. Marks Church Hall at Woolston has been obtained. Recent meetings have included a successful auction, a discussion evening and the F.B.A.S. slide/tape show on Killifishes. Coach trips have been enjoyed by members to the Brighton Show and Exhibition and also the Belle Vue Show. Several members have been active on the show scene and among the awards, two members have shared five Best Fish in Show awards.

The society meets on the first Monday of each month and details will be gladly supplied by the Secretary, D. Mills, 30 Ferndene Way, Bitterne Park, Southampton.

ENTRIES exceeded 450 for the **Torbay A.S.** open show held in October. The results were as follows—Barbs: 1, Messrs. C. and J. Richards (Sudbury); 2, R. Bond (Yeovil); 3, T. Woolley (Torbay); 4, Miss A. Cox (Torbay). Characins: 1, C. Gale (Torbay); 2, C. Turner (Cardiff); 3, R. W. Taylor (Dorchester); 4, E. J. Mabey (Mid-Cornwall). Hypnassobrycon Hemigrammus and Cheridon: 1, F. F. Edwards (Llantwit Major); 2, C. Turner (Cardiff); 3, R. Lee (West Cornwall Fishkeepers); 4, T. Woolley (Torbay). Cichlids: 1, Messrs. P. and Y. Watts (Caerphilly); 2 and 4, E. J. Mabey (Mid-Cornwall); 3, D. G. Roberts (Mid-Cornwall). Angels: 1, M. Poole (Torbay); 2, Mrs. A. Mabey (Mid-Cornwall); 3, J. R. Davis (Torbay); 4, P. and Y. Watts (Caerphilly). Dwarf Cichlids: 1, R. Porch (Ilfracombe); 2, J. Haddon (Ilfracombe). Labyrinth: 1, C. and J. Richards (Sudbury); 2, C. Turner (Cardiff); 3, R. Luscombe (Plymouth); 4, Miss A. Corner (Torbay). Siamese Fighters: 1 and 2, C. and J. Richards (Sudbury); 3, T. Woolley (Torbay); 4, M. Poole (Torbay). Egg-laying Toothcarps: 1 and 3, Mrs. K. Paul (Ilfracombe); 2, B. G. Sell (West Cornwall); 4, M. Poole (Torbay). Tropical Catfish: 1, B. Riste (Chard); 2, R. W. Taylor (Dorchester); 3, A. N. McKinley (Plymouth); 4, W. Horwill (Plymouth). Corydoras and Brochis: 1, T. Woolley (Torbay); 2, Master R. Woolley (Saracen); 3, W. Horwill (Plymouth); 4, B. Riste (Chard). Rasboras: 1, Mrs. K. Paul (Ilfracombe); 2, R. Lee (West Cornwall); 3, C. and J. Richards (Sudbury); 4, C. Turner (Cardiff). Danios and W.C.M.M.: 1, C. and J. Richards (Sudbury); 2 and 4, W. Horwill (Plymouth); 3, J. F. Edwards (Llantwit Major). Loaches: 1, C. Turner (Cardiff); 2, A. Bligh (Ilfracombe); 3, T. Woolley (Torbay); 4, Mr. and Mrs. I. H. Dibble (Naïssa). A.O.S. Tropical Egg-layers: 1, R. Skupper (West Cornwall); 2, W. Horwill (Plymouth); 3, C. Turner (Cardiff); 4, D. F. C. Kenwood (Naïssa). Sexed Pairs: 1, B. Riste (Chard); 2, Mrs. A. Alty (West Cornwall);

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3, J. Rundle (Plymouth); 4, E. Donald (Plymouth). Guppies (Male): 1, Mr. and Mrs. I. H. Dibble (Nailsea); 2, Mrs. A. Alty (West Cornwall); 3, W. G. Reid (F.G.A.) (Plymouth); 4, C. and J. Richards (Sudbury). Guppies (Female): 1 and 2, W. G. Reid (F.G.A.) (Plymouth); 3, G. R. Abbott (Plymouth); 4, B. Gale (Torbay). Swordtails: 1, J. F. Edwards (Llantwit Major); 2, M. Poole (Torbay); 3 and 4, R. Luscombe (Plymouth). Platies: 1, Mrs. J. Griffiths (Torbay); 2, C. and J. Richards (Sudbury); 3, C. Bodd (Torbay); 4, Mr. and Mrs. I. H. Dibble (Nailsea). Mollies: 1, A. Griffin (Chard); 2, T. Woolley (Torbay); 3 and 4, Mr. and Mrs. I. H. Dibble (Nailsea). A.O.V. Livebearers: 1, 2, 3 and 4, Mr. and Mrs. I. H. Dibble (Nailsea). Single Tail Goldfish: 1, Miss J. Rundle (Plymouth); 2, G. Thompson (Torbay); 3 and 4, Mrs. J. Griffiths (Torbay). Bristol Shubunkins: 1, 2 and 3, R. King (Torbay); 4, Mrs. J. Griffiths (Torbay). Twin-tailed Goldfish: 1, Mrs. J. Griffiths (Torbay); 2 and 3, B. Spence (Torbay); 4, G. Thompson (Torbay). A.O.S. Coldwater: 1 and 4, G. Thompson (Torbay); 2, P. and Y. Watts (Caerphilly); 3, Mrs. J. Griffiths (Torbay). Midge, Leather and Mirror Carp, Golden Trench, Orfe and Rudd: 1, 2 and 4, G. Thompson (Torbay); 3, Mrs. J. Griffiths (Torbay). Breeders Tropical Egg-layers: 1, T. Woolley (Torbay); 2, D. F. C. Kerwood (Nailsea); 3 and 4, R. Skipper (West Cornwall). Breeders Tropical Livebearers: 1, Mr. and Mrs. I. W. Dibble (Nailsea); 2, T. Woolley (Torbay); 3, J. Rundle (Plymouth); 4, P. J. Edwards (Llantwit Major). Breeders Coldwater: 1, R. King (Torbay); 2, T. Woolley (Torbay). Plants: 1 and 3, J. R. Davis (Torbay); 2 and 4, Mr. and Mrs. M. Matthews (Torbay).

TABLE show results at the October meeting of the Llantwit Major A.S. were as follows:—Class Barbs: 1, 2 and 4, G. Best; 3, G. Lewis. A.O.V.: 1, G. Best; 2, P. Evans; 3 and 4, G. Lewis.

MEMBERS and guests at the October meeting of the King's Lynn A.S. spent a very entertaining evening taking part in a quiz game. There were a total of six teams and members of the winning team were M. Carter, D. Shaw and P. Rye.

A bench show of Cichlids ran concurrently with the quiz. This was judged by A. Foed and the results were: 1, R. Warner; 2, C. Simper; 3, J. Britain; 4, M. Laws.

New members and visitors are always welcome to come along the second Thursday of each month to the Victoria, Loke Road, Lynn.

TWO recent meetings of the Portsmouth A.S. have included a slide lecture illustrating a general range of the better-known tropical fishes, mainly for the new members and given by Mr. J. Stilwell; and a symposium on tropical fishkeeping in general in which the speakers were J. Stilwell, A. Atkinson and V. Hunt. A table show took place during the second of the two meetings and the results were as follows:—Twin-tailed Goldfish: 1, E. Binstead with a fan-tail. A.O.S. Coldwater Fish: 1, E. Binstead with a pumpkinseed sunfish; 2, V. Hunt with a tanago bitterling; 3, M. Muist with another tanago bitterling.

SHOW results of the West Cumberland A.S. were as follows:—Best in Show and Best Tropical: J. Irwin (Stanley). Exhibitor gaining most points from open classes: R. Strand (West Cumberland). Platies: 1 and 3, A. Howgate; 2, D. Stott (Penrith). Swords: 1 and 2, I. T. Powley (Penrith). Mollies: 1, 2 and 3, I. T. Powley (Penrith). Guppies: 1, R. W. McSherry (Independent); 2, A. Parsley (West Cumberland); 3, I. T. Powley (Penrith). A.O.V. Livebearers: 1, A. Howgate; 2, J. Sharp (West Cumberland); 3, R. Strand. Dwarf Cichlids: 1, J. Irwin; 2, A. Howgate; 3, G. Calvin (Independent). A.O.V. Cichlid: 1, G. Telford (Independent); 2, E. Carr (Independent); 3, G. Calvin. Small Barbs: 1, C. Davison (West Cumberland); 2, D. Stott; 3, L. Sharp (West Cumberland). A.O.V. Barb: 1, D. Stott; 2 and 3, I. T. Powley (Penrith). Best in Small Characins: D. Stott. Hypophosphoryon

and Hemimigonus sp.: 1, D. Stott; 2, Mrs. S. Martin (West Cumberland); 3, A. Howgate. A.O.V. Small Characin: 1, E. W. Hodgson (Penrith); 2, A. Howgate; 3, A. Parkin (Barrow). Large Characins: 1, J. Sharp. Headstanders: 1, J. Irwin; 2, C. Davison. A.O.V. Large Characins: 1, J. Sharp; 2 and 3, R. Strand. Sharks and Flying Foxes: 1, C. Davison; 2, R. B. Mitchell (West Cumberland). Rasbora: 1, 2 and 3, R. Strand. Danios and Minnows: 1 and 3, E. W. Hodgson; 2, I. T. Powley. Killies: 1, A. Howgate; 2, N. Lynch (Stanley); 3, R. B. Mitchell. Catfish and Loaches: 1, E. W. Hodgson. Corydoras and Bechis: 1, E. W. Hodgson; 2, R. Strand; 3, I. T. Powley. A.O.V. Catfish: 1, A. R. Hunt (Border); 2, I. T. Powley; 3, R. B. Mitchell. Loaches: 1, 2 and 3, E. W. Hodgson. Anabantids: 1, D. Stott. Small Anabantids: 1 and 2, A. Howgate; 3, Mrs. S. Martin. A.O.V. Anabantids: 1, D. Stott; 2, R. Strand; 3, G. Calvin. A.O.V. Tropical: 1 and 2, I. T. Powley; 3, R. Strand. Pairs (Livebearers): 1, R. Strand; 2, A. Howgate; 3, I. T. Powley. Pairs (Egg-layers): 1, R. Strand; 2, G. Calvin; 3, Mrs. S. Martin. Breeders (Livebearers): 1, A. Howgate; 2, R. Strand. Breeders (Egg-layers 1-10): 1, A. Howgate; 2, N. Lynch. Breeders (Egg-layers 11-20): 1, R. Strand; 2 and 3, K. W. Burr (Barrow). Common Goldfish: 1 and 2, C. Davison; 3, G. Scott. Shubunkins: 1 and 3, C. Davison; 2, J. Sharp. A.O.V. Singletail Goldfish: 1, G. Stott; 2, J. Sharp; 3, R. Leckie. A.O.V. Twintail Goldfish: 1 and 2, C. Davison. A.O.V. Coldwater: 1, C. Davison; 2 and 3, R. Strand. Novelty Mini Jar (W.G.A.C. Members only): 1, R. Leckie; 2, Miss A. Mitchell; 3, Master R. B. Mitchell.

IN October a knockout match and six-a-side competition were held between Gloucester A.S. and Merthyr A.S. Twenty-six members of Merthyr A.S. made the visit to Gloucester. While the fish were being judged a quiz was held between the two clubs, Gloucester being the winners by 300 pts. to 165 pts. The results of the knockout match were as follows: Livebearers: 1 and 2, B. Bow (Merthyr); 3, Mrs. P. Parsly (Merthyr); 4, D. Parry (Gloucester). Egg-layers: 1 and 4, M. Freshney (Gloucester); 2, P. Wilkes (Merthyr); 3, K. Collier (Merthyr). Six-a-side Livebearers: Merthyr. Egg-layers: Gloucester. Best Livebearer: B. Bow. Best Egg-layer and Best in Show: M. Freshney (Gloucester). After a keenly fought competition Gloucester were overall winners by the narrow margin of 2 pts.

THE breeders open show of the East London A. and P.A. was cancelled due to the recent restrictions on the use of water. In its place a mini convention was held with speakers D. Lambourne giving a very interesting talk on catfish. This was followed by M. Sandford who gave a very enlightening talk on live foods which can be caught from any local pond. B. Pye gave a talk on aquarium photography and last but not least was club member M. Pearson talking about preparation of dry food and rearing baby discus on prepared food. The society would like to express its sincere thanks to all the speakers and to the clubs who attended and would also like to thank D. Fleck, programme secretary, for arranging the speakers at such short notice.

The society would welcome any new members who care to come along on the first and third Friday in the month. Meetings are held at 8 p.m., Ripple Road School, Suffolk Road, off Ripple Road, Barking, Essex.

EARLY in October Rhodda A.S. held their return friendly inter-club with Port Talbot A.S. at Rhodda's venue and were well beaten by the visitors. Results were as follows:—Table show: Egg-layers: 1 and 2, A. and M. Smith (Rhodda); 3, J. Dunn (Port Talbot); 4, R. Fouracre (Port Talbot). Livebearers: 1 and 3, R. Perkins (Port Talbot); 2, B. Fouracre (Port Talbot); 4, A. and M. Smith (Rhodda). Knock Out: Livebearers: 1 and 3, B. Fouracre (Port Talbot); 2 and 4, P. and S. Dewland (Rhodda). Egg-layers: 1 and 4, J. Egan (Port Talbot); 2, A. and M. Smith (Rhodda); 3, J. Dunn (Port Talbot). While the show was

being judged the members were entertained by a lecture given by A. Cick of Rhodda A.S.

THE inter-society show between Oxley and Darlaston societies, was a great success with a class of high-quality fishes, including several rare Lake Malawi and Tanganyika Cichlids. S. Whitehouse, M. Nixon and C. and J. Carrer were the winners for the best fishes in each class. An interesting meeting was held and talks were given by V. Whitehouse on "Odd fishes," illustrating several new species, and K. Hall on Cichlid Fishes. Meetings of the Darlaston and District A.S. are held on the fourth Tuesday of the month at the Conservative Club, Darlaston.

RESULTS of the Killingworth A.A. open show held in September were as follows:—Class B: 1 and 3, Mr. and Mrs. Robson (N.T.F.S.); 2, Mr. Walton (Priory); 4, Mr. Wilson (Ind.). Class Ca and b: 1, Mr. Stevens (Middlesbrough); 2, Mr. Walton (Priory); 3, Mr. Myers (Ind.); 4, Mr. Blenkin (Bridlington). Class C: 1, Mr. Duncanson (Priory); 2, Mr. Patterson (Walsend); 3, Mr. Campbell (Mount Pleasant); 4, Mr. Dixon-Cave (South Shields). Class D: 1, Mr. Blenkin (Bridlington); 2, Mr. Archbold (Ind.); 3, Mr. Wilson (Mount Pleasant); 4, Mr. Napier (South Shields). Class Dc: 1, Mr. and Mrs. Lawson (Novo); 2, Mr. English (N.T.F.S.); 3, Mr. Enwright (South Shields); 4, Mr. Moore (Novo). Class D: 1, Mr. and Mrs. Kidd (Killingworth); 2, Mr. Campbell (Mount Pleasant); 3, Mr. Smith (Killingworth); 4, Mr. Hodgson (Priory). Class E: 1, C. J. Mitchell (South Shields); 2, Mr. Rogan (Killingworth); 3, Mr. Severn (Middlesbrough); 4, Mr. Patterson (Walsend). Class F: 1 and 2, Mr. Pryderick (Ashington); 3, M. and L. Ruffell (South Shields); 4, Laidler Family (Killingworth). Class G: 1 and 3, Mr. and Mrs. Kidd (Killingworth); 2, M. and L. Ruffell (South Shields); 4, Mr. Moore (Novo). Class H: 1, D. and T. Liddle (Bimbi); 2, Mr. and Mrs. Askell (Killingworth); 3, Mr. English (N.T.F.S.); 4, M. and L. Ruffell (South Shields). Class I: 1, M. and L. Ruffell (South Shields); 2, Mr. Renton (Killingworth); 3, Mr. Stevens (Middlesbrough); 4, Mr. and Mrs. Robson (N.T.F.S.). Class K: 1, Mr. and Mrs. Robson (N.T.F.S.); 2, Mr. Stevens (Middlesbrough); 3, Mr. Campbell (Mount Pleasant); 4, Master Armitage (Killingworth). Class L: 1, Mr. and Mrs. Robson (N.T.F.S.); 2, Mr. Myers (Ind.); 3, M. and L. Ruffell (South Shields); 4, D. and T. Liddle (Bimbi). Class M: 1, Mr. Renton (Killingworth); 2, C. and D. McClurg (Stockton); 3, M. and L. Ruffell (South Shields); 4, Mr. and Mrs. Kidd (Killingworth). Class O: 1, M. and L. Ruffell (South Shields); 2 and 4, Mr. Blenkin (Bridlington); 3, Miss C. Mitchell (South Shields). Class P: 1, Mr. Dixon-Cave (South Shields); 2, Mr. Smith (Killingworth); 3, Mr. Duncanson (Priory); 4, Mr. Walton (Priory). Class Q: 1, Mr. English (N.G.L.S.); 2, Mr. Wilks (Stockton); 3, Mr. Smith (Killingworth); 4, Mr. Blenkin (Bridlington). Class R: 1, Mr. Campbell (Mount Pleasant); 2, Mr. Clegg (N.G.L.S.); 3 and 4, Mr. and Mrs. Robson (N.T.F.S.). Class S: 1, Mrs. Lothouse (Whiteby); 2, Mr. Mooney (Stockton); 3, Mr. Douglas (Killingworth); 4, Mr. Hunt (Killingworth). Class T: 1, Mr. Blenkin (Bridlington); 2, Mr. Learoyd (N.G.L.S.); 3, Mrs. Renton (N.G.L.S.); 4, C. J. Mitchell (South Shields). Class U: 1, Mr. Hodgson (Priory). Class N(O-T): 1 and 2, Mrs. Renton (N.G.L.S.); 3, Mr. Dixon-Cave (South Shields); 4, C. J. Mitchell (South Shields). Class N(B-M): 1, Mr. Myers (Ind.); 2, Mr. Walton (Priory); 3, Mr. Blenkin (Bridlington); 4, C. J. Mitchell (South Shields). Class X(O-T): 1, Mrs.

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Renton (N.G.L.S.); 2. Mr. Kirkup (Mount Pleasant); 3. Mr. Clegg (N.G.L.S.); 4. Mr. Dixon-Cave (South Shields). Class X(B-M): 1. Mr. Prytherick (Ashington); 2. Mr. Blenkin (Bedlington); 3 and 4. Mr. and Mrs. Smith (Killingworth). Class Z: 1. Mrs. Renton (N.G.L.S.); 2. Miss Walton (Priory); 3. Mr. Renton (Killingworth). The Best Fish in Show was awarded to an *Epalaeorhynchus kallopterus*, exhibited in Class M and owned by D. Renton. The award for the society gaining the most points was won by the Killingworth A.A.

THE Whitby and District A.S. undertook a new venture in September when they entertained members of "The Half Moon" A.S. (Billingham), Redcar and District A.S. and Cleveland A.S. (Guisborough) in what, it is hoped, was the first of many inter-club competitions, to be held at six-monthly intervals. 21 classes were benched and the results were as follows—Anabantids: 1. J. Bowman (Whitby); Angela: 1 and 2, I. Gray (Whitby); 3. B. Brown (Whitby); Barbs: 1 and 2, B. Brown (Whitby); 3. Mr. and Mrs. Monaghan (Half Moon); Characins: 1. D. Neil (Half Moon); 2. R. Lunn (Redcar); 3. H. and K. Richardson (Whitby); Cichlids: 1 and 3, S. Cox (Redcar); 2. D. Neil (Half Moon); Corydoras: 1. S. Cox (Redcar); 2. D. Monaghan (Half Moon); 3. H. and K. Richardson (Whitby); E.L.T.C.: 1 and 3, Mr. Binks (Half Moon); 2. J. Mortlock (Whitby); Guppies: 1 and 2, J. Duffill (Redcar); 3. S. Wright (Cleveland); Loaches/Botia: 1. J. Duffill (Redcar); 2. D. Forbes (Whitby); 1. Mr. Binks (Half Moon); 2. E. Lofthouse; 3. P. Dryden (Whitby); Platies: 1. R. Lunn (Redcar); Ras-Dan/Minnow: 1. W. Smith (Redcar); 2. J. Duffill (Redcar); 3. S. Wright (Cleveland); Sharks/Fosers: 1 and 2, Mr. Page (Half Moon); 3. W. Smith (Redcar); Fighters: 1 and 2, B. Williamson (Cleveland); 3. Mr. and Mrs. Monaghan (Half Moon); Swords: 1. Mr. Binks (Half Moon); 2. J. Bowman (Whitby); 3. W. Smith (Redcar); Pairs (Livebearers): 1. Mr. and Mrs. Monaghan (Half Moon); 2. Mr. Gledhill (Redcar); 3. D. Monaghan (Half Moon); Pairs (Egglayers): 1. S. Wright (Cleveland); 2 and 3, B. Brown (Whitby); A.O.V. (Livebearers): 1 and 2, Mr. and Mrs. Lowe (Cleveland); 3. Mrs. C. Potter (Whitby); A.O.V. (Egglayers): 1. Mr. Binks (Half Moon); 2. J. Duffill (Redcar); 3. D. Neil (Half Moon); A.O.V. Cais: 1. Mr. and Mrs. Lowe (Cleveland); 2. B. Brown (Whitby); 3. D. Monaghan (Half Moon); A.V.C.W.: 1. Mr. and Mrs. Lowe (Cleveland); 2. D. Halfour (Whitby); 3. I. Gray (Whitby). Best in Show: Mr. Page (Half Moon)—Labeo Bicolor.

The Inter-Club Challenge Trophy presented by the Whitby and District A.S. was won by The Half Moon A.S. who narrowly beat Whitby and District A.S. into second place. The placings were: 1. Half Moon A.S., 64 pts.; 2. Whitby and District A.S., 59 pts.; 3. Redcar A.S., 42 pts.; 4. Cleveland A.S., 28 pts.

Any society interested in an inter-club with Whitby should contact the club secretary, Mrs. Eileen Lofthouse, 41 Derwent Road, Castle Park, Whitby, or telephone Whitby 4299.

A TOTAL of 261 entries was received for the Newport A.S. show. Bearing in mind the hard work which went into the show this was rather disappointing and the lack of support from some societies is to be deplored. However, as far as Newport A.S. were concerned the day went reasonably well, and they thank all the exhibitors for their support.

The results were as follows—Class Ad: 1. Mr. and Mrs. Dore (Newport); 2. S. Bainton

(Newport). Class B: 1. E. Morgan (Merthyr); 2. C. and J. Richards (Neasden); 3. Mr. and Mrs. Guthrie (Rhosow); 4. J. Edwards (Cowbridge). Class C: 1. P. Burton (Merthyr); 2. C. and J. Richards (Neasden); 3. E. Jones (Port Talbot); 4. J. Dunn (Port Talbot). Class Ca: 1. C. and J. Richards (Neasden); 2. J. Edwards (Cowbridge); 3. May Netherell (Riverside); 4. I. Dunn (Port Talbot). Class Da: 1. Mr. and Mrs. T. Edwards (Port Talbot); 2. Mr. and Mrs. Dore (Newport); 3. Mr. and Mrs. Cotton (Port Talbot); 4. Mr. and Mrs. Guthrie (Rhosow). Class Db: 1. Mr. and Mrs. Edwards (Port Talbot); 2. E. Morgan (Merthyr). Class Dc: 1. Mr. and Mrs. Dore (Newport); 2. E. Morgan (Merthyr); 3. A. Payne (Merthyr). Class Dd: 1. A. Payne (Merthyr). Class E: 1. P. Burton (Merthyr); 2. R. Beale (Newport); 3. E. Jones (Port Talbot); 4. C. and J. Richards (Neasden). Class Ea: 1. C. and J. Richards (Neasden); 2. Mr. and Mrs. Guthrie; 3. Mr. and Mrs. C. T. Davies (Port Talbot); 4. W. E. Holland (Nailsea). Class F: 1. M. Davies (Merthyr); 2. M. Morgan (Merthyr); 3 and 4. M. Addicot (Newport). Class G: 1. May Netherell (Fulham); 2. E. Morgan (Merthyr); 3. C. and J. Richards (Neasden); 4. J. Edwards (Llanwit). Class H: 1 and 2, May Netherell (Fulham); 3. H. Chick (Pencoed); 4. Mrs. D. Cruickshank (Ealing). Class I: 1. C. and J. Richards (Neasden); 2. P. Burton (Merthyr); 3. M. Guthrie (Llanwit); 4. Mr. and Mrs. Dore (Newport). Class K: 1. May Netherell (Fulham); 2. 3 and 4. I. Dibble (Nailsea). Class L: 1. C. and J. Richards (Neasden); 2 and 3, Mrs. B. Wye (Ealing); 4. H. Chick (Pencoed). Class M: 1. S. Bartlett (Neasden); 2. A. Brian (Merthyr); 3. A. Payne (Merthyr); 4. G. Biggs (Greenford). Class N: 1. M. Davies (Merthyr); 2. P. Willis (Merthyr); 3. I. Dibble (Nailsea); 4. D. Kenwood (Nailsea). Class O: 1. Mrs. May Netherell (Fulham); 2. Mr. and Mrs. Dore (Newport); 3. I. Dibble (Nailsea); 4. Mr. and Mrs. Davies (Port Talbot). Class P: 1. I. Dibble (Nailsea); 2. Mr. and Mrs. Dore (Newport); 3. Mrs. D. Cruickshank (Ealing); 4. C. and J. Richards (Neasden). Class Q: 1. R. Perkins (Port Talbot); 2. B. Bow (Merthyr); 3. Mrs. D. Cruickshank (Ealing); 4. Mr. and Mrs. T. Edwards (Port Talbot). Class R: 1. R. Perkins (Port Talbot); 2. I. Dibble (Nailsea); 3. C. and J. Richards (Neasden); 4. P. Willis (Merthyr). Class S: 1. A. E. Bryce (Ponarcro (Port Talbot)); 2. B. Bow (Merthyr); 3. C. Morrison (Port Talbot); 4. Mr. and Mrs. Edwards (Port Talbot). Class T: 1 and 2, R. Purdy (Merthyr); 3. M. Davies (Merthyr); 4. C. E. Morrison (Port Talbot). Class W: 1 and 2, Carol Rupert (Port Talbot); 3. Mr. and Mrs. Guthrie (Llanwit); 4. A. C. Weller (Newport). Class XBM: 1. W. Holland (Nailsea); 2 and 4, Mr. and Mrs. Dore (Newport); 3. R. Fitchett (Nailsea). Class X-OT: 1 and 3, I. Dibble (Nailsea); 2. Mr. and Mrs. Dore (Newport); 4. R. Purdy (Merthyr). Class B-M: A.V.: 1, 2 and 3, B. Bow (Merthyr); 4. H. Weller (Newport). Class O-TY: A.V.: 1, 2, 3 and 4, C. Morgan (Merthyr). Best Fish in Show: Mrs. May Netherell (Fulham), Riverside A.S.; Class H.

IN October members of the **British Aquarists Study Society** enjoyed their annual general meeting and autumn meeting at the Meeting Rooms, London Zoo, Regents Park. During the afternoon over seventy members and friends participated in a symposium on the Cichlids of Lake Malawi, addressed by Dr. Ethelwynn Trewavas of the British Museum of Natural History and other members. A display of various fishes from that area was on view and much discussion on these popular species was stimulated.

Although predominantly a corresponding society, B.A.S.S. meets three times a year at the Zoo when a variety of subjects are presented. A journal is published and distributed to members monthly and experiments appertaining to the aquatic hobby are regularly undertaken. For further information please contact the general secretary, Michael Shadrack, 61 St. Barnabas Road, Woodford Green, Essex.

OPEN show results of the **Bethnal Green A.S.** were as follows—Class Aa/b: 1. Bethnal Green. Class Ag: 1. M. Kudervitch; 2. Miss D.

Connelly; 3. D. North. Class Ak: 1. A. Worth; 2. S. Hedges; 3. D. North; 4. V. Feast. Class B: 1. P. Coyle; 2. B. Sayer; 3. Mr. and Mrs. Brook; 4. Mr. and Mrs. Rooney. Class C: 1. C. Harding; 2. C. and D. Pinna; 3. R. Thoday; 4. B. Sayer. Class Ca: 1. A. Noronha; 2. 3 and 4, R. Thoday. Class Cb: 1. J. Walker; 2. M. Dore; 3. C. Harding; 4. A. Thacker. Class D: 1. Mr. and Mrs. Houghton; 2. A. Noronha; 3 and 4, A. Worth. Class Dd: 1 and 2, R. C. Smith; 3. W. Sutton; 4. Mr. and Mrs. Houghton. Class E: 1. S. Parrish; 2. A. Chandler; 3 and 4, C. Turner. Class Ea: 1 and 2, T. Woolley; 3. Mr. and Mrs. Shirley; 4. A. Noronha. Class Eb: 1. C. and D. Finnes; 2. B. Sayer; 3 and 4, C. Goddard. Class F: 1. R. Thoday; 2. Mr. and Mrs. Houghton; 3. G. Owen; 4. C. Cheswright. Class G: 1. M. Netherell; 2. G. Nichols; 3. Mr. and Mrs. Houghton; 4. C. Turner. Class H: 1. K. Nichols; 2. M. Netherell; 3. P. Coyle; 4. W. Dale. Class I: 1 and 2, T. and J. Ramshaw; 3. Mrs. Winder; 4. A. Feast. Class K: 1 and 4, J. Connelly; 2. T. and J. Ramshaw; 3. Mr. and Mrs. Rooney. Class L: 1. R. Thoday; 2. A. Feast; 3. M. Dore; 4. D. Winder. Class M: 1 and 2, A. Worth; 3. R. Thoday; 4. Mr. and Mrs. Rooney. Class N(b/m): 1. Mr. and Mrs. Houghton; 2. A. Noronha; 3. R. Chapman; 4. P. Green. Class O: 1, 2, 3 and 4, A. Noronha. Class O: 1. J. Carney; 2. D. North; 3. A. Sharp; 4. M. Netherell. Class P: 1, 2, G. Goddard; 3. A. Noronha; 4. P. Coyle. Class Q: 1, 3 and 4, A. Noronha; 2. M. Collins. Class R: 1. A. Noronha; 2, 3 and 4, C. and D. Finnes. Class S: 1 and 2, J. Smith; 3. J. Carney; 4. W. Wiegold. Class T: 1, 2 and 4, A. Noronha; 3. D. Cheswright. Class U: 1. A. Leisure; 2. Miss L. Feast; 3. B. Fry; 4. D. Cheswright. Class V: 1. A. Bullock; 2. J. Kingsland; 3 and 4, D. Mills. Class W: 1. J. Kingsland; 2. B. Fry; 3. S. Hedges; 4. F. Wilson. Class X(b/m): 1. M. Dore; 2. C. Cheswright; 3. W. Barker; 4. D. Cheswright. Class Xc: 1, 2, 3 and 4, A. Noronha. Class Xu/w: 1. J. Kingsland; 2, 3 and 4, D. Mills. Class Z: 1 and 3, Mr. Cheswright; 2. G. Reading; 4. Miss T. Hedges. Class B/Ty: 1. D. Winder; 2. G. Heal; 3. A. Waller; 4. M. Cooper. Mrs. May Netherell (Riverside) won the Best Fish in Show award with a *Sydnitis clarus*. This exhibit also won the best exhibit in the ladies section. The best livebearer trophy was won by A. E. Noronha (Orpington) with a *Xiphophorus monstremae*.

CHANGES made recently in positions of the **Castleford A.S.** are as follows: The chairman is now Mr. C. Carrick, 193 Netherlon Lane, Netherlon, Wakefield, and the secretary is Mr. F. Holmes, 48 Elmets Road, Ferry Jupton, Castleford, Yorks.

DURING September **Coventry Pool and A.S.** had an illustrated lecture from Alan Robinson on wood and roots and the best way to treat them for use in the aquarium. Table show results were as follows—A.V. Cichlid: 1 and 3, R. Cleaver; 2. A. Simmons; 4. F. Hirst. A.V. Single-tail Goldfish: 1, 2, and 3, D. Eastwood; 4. D. Hancock. A.V. Characin (Large): 1 and 4, R. Cleaver; 2 and 3, F. Hirst. A.V. Killifish: 1. R. Humer; 2. R. Cleaver; 3 and 4, F. Hirst.

OFFICERS for **Swillington A.S.** during the coming year are: president, J. A. Tiffany; secretary, P. Campden, 4 Edinburgh Place, Garforth, Leeds (Tel.: Garforth 88605); treasurer, R. Hislop (Sen.); show secretaries, Mr. and Mrs. D. P. Biddall. New members are assured of a warm welcome to any of the meetings which are held on the first and third Tuesday of each month. Further details can be obtained from the secretary.

OVER 530 entries were exhibited at the **Huddersfield Tropical Fish Society** open show. The results were as follows—Play: 1. Mr. Blandell (Doncaster); 2 and 3, Mr. Goulding (Rimington); Guppy: 1. Mr. and Mrs. Richmond (Retford); 2. Mr. and Mrs. J. Riley (Castleford); 3. Mr. and Mrs. Moore (Sheaf Valley); Molly: 1. Mr. and Mrs. Holmes (Castleford); 2. T. Timsley (Rotherham); 3. G. Frisby (Hull). Swords: 1. Mr. and

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Mrs. Riley (Castleford); 2, N. Blenkin (Bridlington); 3, P. Topley (Aireborough). A.O.V. Tropical: 1, B. Jackson (Doncaster); 2, D. P. Birdall (Swillington); 3, Mr. and Mrs. Chester (Retford). Large Characins: 1, T. Tinsley (Rotherham); 2, Mr. and Mrs. Willey (Scarborough); 3, Mr. and Mrs. J. Riley (Castleford). Small Characins: 1, J. Gatterright (Huddersfield); 2, Mr. and Mrs. Hopkinson (Darfield); 3, Mr. and Mrs. Roberts (Doncaster). Small Barbs: 1, M. Price (Castleford); 2, Mr. and Mrs. Tyson (S. Humber-side); 3, Mr. and Mrs. Emmerson (Castleford). Large Barbs: 1, A. Cook (Retford); 2, D. L. Harrop (Huddersfield); 3, Mr. and Mrs. Roberts (Doncaster). Danios and Rasboras: 1, Mr. and Mrs. Tyson (S. Humber-side); 2, Master S. White (Retford); 3, Miss S. Scuff (Morley). Egg-laying Toothcarps: 1, Mr. and Mrs. Morrissy (Immingham); 2, Mrs. L. C. Heap (Keighley); 3, B. Appleby (B.K.A.). Cichlids (Rift Valley): 1, Mr. and Mrs. K. Welsh (York); 2, L. Price (Castleford); 3, Mr. and Mrs. Fletcher (Doncaster). Angles: 1, Binns and Caldwell (Scotchthorpe Museum); 2, Mr. and Mrs. Richmond (Retford); 3, A. Hibby (Wylenshaw). Dwarf Cichlids: 1, N. Blenkin (Bridlington); 2, Binns and Caldwell (Scotchthorpe Museum); 3, P. Northrop (Hull). Large Cichlids: 1, Mr. and Mrs. Hopkinson (Darfield); 2, Mrs. K. McBride (Aireborough); 3, Mr. and Mrs. Willey (Scarborough). A.O.V. Anabantids: 1, Mr. and Mrs. Feay (Doncaster); 2, Mr. and Mrs. Ellis (Ostram); 3, C. Carrick (Castleford). Fighters: 1, Mr. and Mrs. J. Riley (Castleford); 2, Mr. and Mrs. Snowden (York); 3, Mr. and Mrs. Chester (Retford). Small Anabantids: 1, P. Birdall (Swillington); 2, Mr. and Mrs. Tyson (S. Humber-side); 3, J. Belton (Morley). A.O.V. Cats: 1, Mr. and Mrs. Emmerson (Castleford); 2, Mr. and Mrs. Holmes (Castleford); 3, T. Sanderson (Thorne). Corydoras: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. and Mrs. Emmerson (Castleford); 3, Mr. Hurdell (Doncaster). Loaches: 1, G. Allen (S. Humber-side); 2, Binns and Caldwell (Scotchthorpe Museum); 3, T. Sanderson (Thorne). Sharks and Foxes: 1, D. Sugden (Bradford); 2, T. Sanderson (Thorne); 3, Mr. Hardcastle (Aireborough). A.O.V. Tropical: 1, A. Frisby (Hull); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Fletcher (Doncaster). Breeders Egg-layers (1-10): 1, J. J. Bangham (Huddersfield). Breeders Egg-layers (11-20): 1, Master S. White (Retford); 2, B. Jackson (Doncaster); 3, Mr. and Mrs. K. Walsh (York). Breeders livebearers (1-10): 1, D. P. Birdall (Swillington); 2, Mr. Walker (Aireborough); 3, B. Jackson (Doncaster). Breeders livebearers (11-20): 1, J. Abbott (Aireborough); 2, J. Bosfield (Barnsley); 3, B. Jackson (Doncaster). Pairs Livebearers: 1, B. Jackson (Doncaster); 2, N. Blenkin (Bridlington); 3, B. Jackson (Doncaster). Pairs Egg-layers: 1, Master S. White (Retford); 2, C. Carrick (Castleford); 3, Mr. and Mrs. Morrissy (Immingham). A.O.V. Coldwater: 1, K. M. Wood (York); 2, Mr. Blundell (Doncaster); 3, Mr. and Mrs. Hopkinson (Darfield). Fancy Goldfish: 1, E. J. Brown (Huddersfield); 2, Miss S. McBride (Aireborough); 3, K. and M. Wood (York). Common Goldfish: 1 and 3, L. Walker (Rotherham); 2, D. Brook (Huddersfield). Juniors: 1, Miss S. McBride (Aireborough); 2, Master S. White (Retford); 3, R. Gatenby (Bradford). Ladies: 1, Mrs. G. Frisby (Hull); 2, Mrs. K. McBride (Aireborough); 3, Mr. Emmerson (Castleford). Furnished Jar: 1, Mr. and Mrs. Feay (Doncaster). Marine: 1, Mr. Simpson (Queen of the Midlands); 2, J. Kistall (Huddersfield); 3, T. Bosfield (Barnsley). Novelty Section: 1, L. Lancashire (Doncaster); 2, B. Garrett (Huddersfield); 3, Mr. and Mrs. J. Riley (Castleford). A.O.V. Novice: 1 and 3, M. Marsden (Ind.); 2, Mr. Sykes (Ind.). Best in Show Award went to A. Frisby in the A.O.V. Tropical section. Best Exhibit was in the Breeders Egg-layer (1-10), won by B. Jackson.

RESULTS of the Chesterfield and District A.S. open show held in September were as follows:—Best Fish of the show was a Characidium Fasciatum owned by A. T. Tinsley (Rotherham). Guppies: 1, S. and P. Ipakhi (Sh. V.); 2, Mr. and Mrs. Richmond (Ret.); 3,

Mr. and Mrs. Copley (D.). Platies: 1, Mr. and Mrs. Goulding (Ind.); 2, A. Cook (Ret.); 3, Mr. and Mrs. Riley (Cast.). Mollies: 1, C. Carrick (Cast.); 2, Binns and Caldwell (Sc.); 3, Mrs. G. Frisby (Hu.). Swordtails: 1, N. Blenkin (Brid.); 2, Mr. and Mrs. A. Darby (Hyde); 3, Mr. and Mrs. Moore (Sh. V.). A.O.V. Livebearer: 1, B. Jackson (D.); 2, N. Blenkin (Brid.); 3, A. Whittaker (Atac.). Small Characins: 1, Binns and Caldwell (Sc.); 2, B. Ward (D.); 3, Mr. and Mrs. Hopkins (Da.). Large Characins: 1, A. T. Tinsley (Ro.); 2 and 3, Mr. Simpkins (L.E.). Small Barbs: 1, Mr. and Mrs. Blades (Blaw); 2, Mr. and Mrs. Fletcher (D.); 3, J. Neville (Gr.). Large Barbs: 1 and 2, W. E. Neville (Gr.); 3, A. Cook (Ret.). Small Cichlids: 1, Miss S. Goddard (Mac.); 2, S. Hill (Al.); 3, Mr. and Mrs. Fletcher (D.). Large Cichlids: 1, Mr. Howell (D.); 2, Mr. and Mrs. Hopkinson (Da.); 3, A. Cook (Ret.). Angles: 1, G. Hoyland (D.V.); 2, Mr. Merrill (Ind.); 3, Mrs. M. Hooley (Blaw). Rift Valley Cichlids: 1, Mr. and Mrs. Fletcher (D.); 2, A. Frisby (Hu.); 3, Mr. Waddingham (Ind.). Small Anabantids: 1, A. Clayton (Imm.); 2, Master C. Mangles (Ret.); 3, C. Carrick (Cast.). Large Anabantids: 1, J. Banks (Mex.); 2, C. Carrick (Cast.); 3, Mr. and Mrs. Goddard (Mac.). Fighters: 1, Mr. and Mrs. Tomlinson (Mac.); 2, Mr. and Mrs. J. Riley (Cast.); 3, J. Banks (Mex.). Corydoras and Brochis: 1, C. Carrick (Cast.); 2, D. Harris (Mex.); 3, Binns and Caldwell (Sc.). A.O.V. Garfish: 1, T. Sanderson (Th.); 2, Mr. and Mrs. Morrissy (Imm.); 3, Mr. and Mrs. Riley (Cast.). Loaches and Botias: 1, Mr. and Mrs. Daines (D.); 2 and 3, Binns and Caldwell (Sc.). Rasb. Dan. and Mins.: 1, J. Booth (Lou.); 2 and 3, A. Omslow (Lou.). E.L. Toothcarps: 1 and 2, Mr. and Mrs. Blades (Blaw); 3, G. Hoyland (D.V.). Sharks and Foxes: 1, Mr. and Mrs. Goulding (Imm.); 2, Mr. and Mrs. Copley (D.); 3, T. Sanderson (Th.). Pairs (Livebearers): 1, B. Jackson (D.); 2, A. Clayton (Imm.); 3, Mr. and Mrs. Daines (D.). Pairs (Egg-layers): 1, D. and M. Laycock (Sh. V.); 2, Mr. and Mrs. Blades (Blaw); 3, Master S. White (Ret.). Breeders (Livebearers 1-10): 1, Mr. and Mrs. Agar (Air.); 2, Mr. and Mrs. Roberts (D.); 3, Mr. and Mrs. Copley (D.). Breeders (Livebearers 11-20): 1, B. Jackson (D.); 2, Mr. and Mrs. Hopkinson (Dar.). Breeders (Egg-layers 1-10): 1, B. Jackson (D.); 2, Mr. and Mrs. Bradshaw (Sh. V.); 3, N. Blenkin (Brid.). Breeders (Egg-layers 11-20): 1, Miss J. Cavill (D.); 2, Master S. White (Ret.); 3, Mr. and Mrs. Blades (Blaw). A.O.V. Tropical: 1, A. Frisby (Hu.); 2, J. Gabe (Ind.); 3, Mr. Simpson (Q. of M.). A.V. Female: 1, A. Clayton (Imm.); 2, L. Waller (Ro.); 3, N. Blenkin (Brid.). Juniors (A.V.): 1, C. Calow (Bo.G.); 2, G. Sanderson (Th.); 3, N. Turner (Th.). Furnished Mini Jars: 1, Mr. and Mrs. Agar (Air.); 2, Mr. and Mrs. Hooley (Blaw); 3, Mr. and Mrs. Feay (D.). Common Goldfish: 1, L. Waller (Ro.); 2, Mr. and Mrs. Feay (D.); 3, K. Chapman (Mex.). Fancy Goldfish: 1 and 2, Mr. Sykes (J. and S. Leic.); 3, Mr. Goddard (Ind.). A.O.V. Coldwater: 1, C. Carrick (Cast.); 2, Mr. and Mrs. Riley (Cast.); 3, Mr. and Mrs. Roberts (D.).

THERE were 314 entries for the Mount Pleasant A.S. open show in September. Best in Show award went to R. Neworthy (Northumbria) with a splendid Corydoras. Results were as follows:—Class Bd: 1, C. Robinson (Stanley); 2, M. Hunt (Killingworth); 3, T. Hymers (Novos); 4, D. Russell (Stanley). Class B: 1 and 2, B. Robson (N.T.F.S.); 3, G. Quantrell (Priory); 4, P. Druit (M.P.A.S.). Class C: 1, J. Irwin (Stanley); 2, T. Dixon-Cave (South Shields); 3, J. Robertson (Northumbria); 4, J. Ovanson (N.T.F.S.). Class Da: 1, J. Sarties (Stanley); 2, J. Irwin (Stanley); 3, A. Harvey (M.P.A.S.); 4, G. Gallon (Ind.). Class Db: 1, J. Irwin (Stanley); 2 and 3, L. Southall (S.S.); 4, M. Campbell (M.P.A.S.). Class Dc: 1, D. Wright (Ind.); 2, C. Enright (S.S.); 3, P. Newton (Hartlepool); 4, A. Weir (Hartlepool). Class D: 1, P. Newton (Hartlepool); 2, J. Middlemass (Stanley); 3, F. Myers (Ind.); 4, M. Campbell (M.P.A.S.). Class Ea: 1, C. Robinson (Stanley); 2 and 3, B. Foster (Bimbi); 4, A. Howgate (Stanley). Class E: 1, C. Mitchell (S.S.); 2, P. Redman

(Hartlepool); 3, J. Rogan (Killingworth); 4, K. Nunn (Stockton). Class F: 1, E. Prythick (Ashington); 2, 3 and 4, J. W. Pells (Priory). Class G: 1 and 2, L. Southall (S.S.); 3, J. Bloomfield (M.P.A.S.). Class H: 1, R. Neworthy (Northumbria); 2 and 4, C. Mallaby (M.P.A.S.); 3, R. T. Wright (M.P.A.S.). Class J: 1, P. Wright (Ind.); 2, B. Robson (N.T.F.S.); 3, A. Bloomfield (M.P.A.S.); 4, R. Turrett (M.P.A.S.). Class K: 1, B. Robson (N.T.F.S.); 2, A. Stevens (Middleborough); 3, D. Campbell (M.P.A.S.); 4, G. D. McClure (Stockton). Class L: 1, F. Myers (Ind.); 2, R. Neworthy (Northumbria); 3, J. K. Alder (Hartlepool); 4, P. Taylor (M.P.A.S.). Class Ma: 1, Mr. and Mrs. Wright (S.S.); 2, D. Dryden (M.P.A.S.); 3, G. D. McClure (Stockton); 4, M. Campbell (M.P.A.S.). Class Mb: 1, Mr. and Mrs. P. Marsden (Stockton); 2, R. O'Connor (M.P.A.S.); 3, D. Russell (Stanley); 4, G. Johnson (Stockton). Class Nm: 1, F. Napier (South Shields); 2, C. Mallaby (M.P.A.S.); 3, A. Stevens (Middleborough); 4, Mr. and Mrs. Wood (Stockton). Class No: 1, T. Marshall (N.T.F.S.); 2, R. Neworthy (Northumbria); 3, Mr. and Mrs. Wood (Stockton). Class O: 1, E. and M. Perkins (Ashington); 2, R. Hill (N.G.L.S.); 3, Miss D. Knibbs (Stockton Junior); 4, S. Wilks (Stockton). Class P: 1, T. Marshall (N.T.F.S.); 2, A. Duncanson (Priory); 3, R. Neworthy (Northumbria); 4, G. Hurst (M.P.A.S.). Class Q: 1, S. Wilks (Stockton); 2, D. Hammond (South Shields); 3, A. Campbell (M.P.A.S.); 4, J. Rogan (Killingworth). Class R: 1, A. Clegg (Novos); 2 and 3, Kirkup (M.P.A.S.); 4, J. Irwin (Stanley). Class S: 1, A. Redford (Priory); 2, J. W. Pells (Priory); 3, R. Neworthy (Northumbria); 4, G. Hurst (M.P.A.S.). Class T: 1, G. Leayard (Novos); 2 and 4, T. Marshall (N.T.F.S.); 3, C. Mitchell (South Shields). Class W: 1, E. Hodgson (Priory); 2 and 3, A. Duncanson (Priory); 4, P. Maddison (South Shields). Class Xbm: 1, E. Prythick (Ashington); 2, D. Dryden (M.P.A.S.); 3, J. Bloomfield (M.P.A.S.); 4, C. A. Enright (South Shields). Class Yot: 1, Mr. and Mrs. Wood (Stockton); 2, J. English (N.G.L.S.); 3, A. Redford (Priory); 4, G. Leffroyd (Novos).

THERE were 534 entries for the first National and Third Welsh open show (C.N.A.A.) which was a great success. Winners of the award for the Welsh club stands were Aberdare A.S., Merthyr Tydfil A.S. being the runners-up. The show results were as follows:—Class AG: 1, Mr. and Mrs. W. G. Best; 2 and 3, D. C. Davies. Class BA: 1, R. F. Adams; 2, R. Brown; 3 and 4, J. F. Edwards. Class B: 1, Mr. and Mrs. W. G. Best; 2 and 3, P. Moyer; 4, Mrs. D. Cruickshank. Class C: 1, Mr. and Mrs. W. G. Best; 2, H. Chick; 3, D. Marsh; 4, J. F. Edwards. Class CB: 1, Mr. and Mrs. W. G. Best; 2, C. Harding; 3, P. Moyer; 4, T. Edwards. Class C: 1, P. Harding; 2, C. Turner; 3, Mr. and Mrs. R. Bebb; 4, Mr. and Mrs. W. G. Best. Class DA: 1, T. Edwards; 2, P. Y. Watts; 3, E. Brown; 4, R. Perkins. Class DB: 1, T. Edwards; 2 and 3, B. Brown. Class DC: 1, Mr. and Mrs. Dove; 2, E. Morgan; 3, D. Hall; 4, P. Y. Watts. Class D: 1, R. F. Adams; 2, Mr. and Mrs. M. Williams; 3, J. F. Edwards; 4, A. Payne. Class EA: 1, D. J. Jackson; 2, Mr. and Mrs. Guthrie; 3 and 4, Mr. and Mrs. Dibble. Class E: 1, C. Turner; 2, D. Kenwood; 3, Mr. and Mrs. W. G. Best; 4, Miss D. Lewis. Class F: 1 and 3, D. J. Jackson; 2, Mr. and Mrs. M. Williams; 4, Mr. and Mrs. R. Bebb. Class G: 1, V. Bruce; 2, B. Brown; 3, E. Morgan; 4, R. F. Adams. Class H: 1, T. Cruickshank; 2, P. Moyer; 3 and 4, Mr. and Mrs. W. G. Best. Class J: 1 and 3, Mr. and Mrs. R. Bebb; 2, C. Turner; 4, Mr. and Mrs. W. G. Best. Class K: 1 and 2, P. Moyer; 3, Mr. and Mrs. Guthrie; 4, J. F. Edwards. Class L: 1, P. Moyer; 2, H. Chick; 3, K. and R. Williams; 4, C. Turner. Class Ma: 1, H. Chick; 2, M. Neithers; 3, J. F. Edwards; 4, P. R. Stonebrow. Class Mb: 1, Mr. and Mrs. Guthrie; 2, D. Kenwood; 3, C. Turner; 4, T. Cruickshank. Class N-BM: 1, R. F. Adams; 2 and 3, T. Cruickshank; 4, M. Davies. Class N-O-T: 1, Mrs. D. Cruickshank; 2 and 3, Mr. and Mrs. Dibble; 4, R. F. Adams. Class O A-D: 1, B. Purdy. Class O E-R: 1, M.

Netherell; 2, Mr. and Mrs. W. G. Best; 3, Mr. and Mrs. C. J. Davies; 4, E. Hurley. Class P: 1, J. Egan; 2, Mr. and Mrs. Dibble; 3, J. F. Edwards; 4, Mrs. D. Cruickshank. Class Q: 1, R. Perkins; 2 and 3, Mr. and Mrs. R. Bebb; 4, Mrs. D. Cruickshank. Class R: 1, D. Marsh; 2, P. Moye; 3, B. Fouracre; 4, P. Willis. Class S: 1, B. Bow; 2, M. Davies; 3, C. E. Morrison; 4, Mr. and Mrs. R. Bebb. Class T: 1, 2, 3 and 4, B. Purdy. Class X B-M: 1, D. Kenwood; 2, J. Biffie; 3, P. Moye; 4, Mr. and Mrs. W. G. Best. Class X O-F: 1, C. Turner; 2, C. E. Morrison; 3, Mr. and Mrs. R. Bebb; 4, Mr. and Mrs. Dibble. Class B-M: 1, B. Bow; 2, K. Harding; 3, K. and R. Williams; 4, P. Harding. Class O-TY: 1, A. Parker; 2, 3 and 4, C. Morgan. Class UA-UD: 1, Mr. and Mrs. Guthrie; 2, D. J. Jackson; 3 and 4, C. Rupert. Class UB-UC: 1, 2, 3 and 4, C. Rupert. Class V: 1, 2, 3 and 4, C. Rupert. Class WA: 1, 2 and 3, C. Rupert; 4, P. Jones. Class W: 1, C. Rupert; 2, M. Thomas; 3, C. E. Morrison; 4, P. Y. Watts. Best Fish in Show: H. Chick (Red-Finned Shark). Highest Pointed Exhibitor: C. Rupert. Highest Pointed Society: Port Talbot A.S.

A NEW committee was elected at the annual general meeting of the **South East London A.S.**. The officers are now as follows:—Chairman: J. Walker, 28 Sedgebrook Road, Kidbrook, S.E.3, 01-856 6059; secretary: S. Howes, 109 Farley Road, S.E.6, 01-697 7222; show secretary: T. Asquith, 49 Central Avenue, Welling, Kent, 854 0262; treasurer: R. Houghton; P.R.O., F.B.A.S.: Mr. and Mrs. J. Ackland, 146 Mayeswood Road, S.H.12, 01-851 1399. The meeting night was also changed and as from 8th November, the meetings will be held on alternate Monday nights, at the same venue, viz., 146 West Greenwich House, Greenwich High Road, S.E.10.

RESULTS of the Bristol A.S. table show in October were: A.O.V. Pond or River Fish: 1, E. Bowden; 2, J. Phillips; 3, Miss H. Morgan; 4, W. G. Ham. A.O.V. Fancy Fish: 1, E. Bowden. Shubunkins Breed 1976: 1, 2 and 3, V. Cole; 4, S. Lloyd. Labyrinths: 1, Miss H. Morgan; 2 and 3, J. Phillips. Livebearers: 1 and 2, Mrs. Matthews; 3, J. Phillips. A.O.V. Egglayers: 1, Miss H. Morgan.

THE Wrexham Tropical Fish Society annual general meeting was held recently and the committee eventually elected for the forthcoming year was: chairman, R. Smith; vice-chairman, R. Mathers; secretary, E. Jones; treasurer, Mrs. V. Oliver; show secretary, C. Pritchard; committee members, Mrs. Jones, S. Howells, R. Furneaux, T. Pousd, J. A. Parry; Newsletter editor, F. Oliver; librarian, Mrs. J. A. Parry. Best wishes were expressed to Chris and John Sergeant who are, regrettably, leaving the area.

The Autumn Fish Show results were: A.O.V. Catfish: 1, 2 and 3, R. Furneaux. Botia: E. Jones. Loaches: Mr. and Mrs. J. A. Parry. Characins: 1, F. Oliver; 2, S. Howells; 3, P. Jones. Anabantids: 1 and 3, P. Jones; 2, F. Oliver. Highest Pointed Junior: P. Smith. Autumn Shield Winner: P. Jones.

AN Inter Society Aquarium Show was held at the Dunlop Speke Sports and Social Club, the societies taking part being **Dunlop A.K.S., Hoylake A.S., St. Helens A.S. and N.W. Cheshire A.S.** The two hundred exhibits included freshwater tropical marine and cold-water fish and a very high standard was reached in all fourteen classes. The awards were presented by Mr. B. Riding, the secretary of the Dunlop Speke Sports and Social Club and the result of the competition was:—1, Dunlop A.K.S., 42 points; 2, Hoylake A.S., 22 points; 3, St. Helens A.S., 14 points; 4, N.W. Cheshire A.S., 3 points. The class winners were:—Livebearers: B. W. Carter (St. Helens A.S.); Anabantids: Master T. Hopkins (Dunlop A.K.S.); Cichlids: K. Sey (Dunlop A.K.S.); Barbs: D. H. Neave (Hoylake A.S.); Characins: T. Hampton (Dunlop A.K.S.); Rasboras: R. Lee (Hoylake A.S.); A.O.V.: H. D. Bauer (Dunlop A.K.S.); Catfish: A. Fowler (Hoylake A.S.); Sharks: T. Hampton (Dunlop A.K.S.); Pairs: A. Fowler (Hoylake A.S.); Juniors:

Egglayers: Master I. Hopkins (Dunlop A.K.S.); Juniors, Livebearers: Miss J. Crichton (N.W. Cheshire A.S.); Coldwater: Master I. Hopkins (Dunlop A.K.S.); Marine: D. A. Neave (Hoylake A.S.). Best In Show: D. A. Neave (Hoylake A.S.).

RESULTS of the Fish Show held by Brighton and Southern A.S. early in October. Class O.P.: 1, Master C. Hooper; 2, Mr. and Mrs. Hooper; 3, Mr. and Mrs. Houghton; 4, Mr. and Mrs. Ramsay. Class Q.R.S.: 1, Mr. and Mrs. Shanklin; 2, Mr. and Mrs. Sayers; 3 and 4, Mr. J. Smith. Class T.: 1, 2 and 4, Mr. and Mrs. Ramsay; 3, Mr. and Mrs. Sayer.

Preparations are now being made for the Open Show and Exhibition. The Open Show will be held on Sunday, 3rd July at Portside Town Hall, Victoria Road, Portside. Details from show secretary, Mr. M. Rooney, 66 Portland Villas, Hove, Sussex, phone, Brighton 411131.

MEMBERS of the Mid-Sussex A.S. have been busy recently with fund raising activities which included a sponsored swim, sale of scrap paper and a jumble sale. Next year's prize-giving and dance will be held on Friday, 18th February. The table show results for October were as follows: Novices: 1, 2 and 4, S. Frost; 3, G. Spanshott. Fish of the Year: 1 and 2, Mr. and Mrs. Houghton; 3, B. Slade; 4, E. and T. Tester. Breeders Egglayers: 1, Mr. and Mrs. Houghton; 2 and 3, B. Slade. Plants: 1 and 2, E. and T. Tester. Further details may be obtained from the secretary, Mr. B. Slade, Sanderson, Bolney Road, Araraty, H. Heath (H. Heath 53747).

THE Northern Goldfish and Pondkeepers Society meetings are held on the second Sunday of each month at 3.00 p.m. in the Baptist Church Hall, Beacon Road, Fallowfield, Manchester. New members welcome.

DUE to the water crisis the **Walthamstow and District A.S.** were reluctantly forced to postpone their open show which was to have been held in November. The society has, however, decided to hold a show during the coming spring. It will consist of the usual full open schedule and some additional attractions yet to be planned when it is hoped there will be the opportunity to welcome friends, old and new, on a date to be fixed.

CHANGING of committee of the **Bletchley and District A.S.** are as follows: chairman: M. Warren, 75 Myrtle Bank, Stacey Bushes, Milton Keynes. Secretary: Mrs. M. Brazier, 28 Oakwood Drive, Bletchley, Milton Keynes. Treasurer: Mrs. G. Fabian, 20 Hatton, Tinkers Bridge, Milton Keynes.

OFFICERS elected at the annual general meeting of the **Chingford and District A.S.** were as follows:—Chairman, R. Smith; Secretary, Mrs. L. Harris, 6 Victoria Road, South Woodford, E.18; Treasurer, D. Shea; Show Secretary, S. Harris. The society is looking forward to a very interesting and varied year, which will be including lectures, slide shows, quiz's, auctions, raffles and discussions.

New members can be assured of a warm welcome. Meetings are held at Friday Hill House, Simmons Lane, E.4 every 2nd and 4th Wednesday of each month at 8 p.m.

THE list of officers for the South Shields A.S. is now as follows: Chairman, C. A. Emlight; Vice-Chairman: L. A. Ruffell; Secretary, Mrs. H. Ruffell, 23 Nora Street, South Shields; Tyne & Wear; Asst. Secretary, R. Davies; Treasurer, R. Scott; Asst. Treasurer, L. Southall; Show Secretary, A. Brown, 45 Harton House Road, South Shields, tel. 60274; Asst. Show Secretary, M. Ruffell; Social Secretary, Mrs. L. Scott; Asst. Social Secretary, Mrs. A. Turnbull; Librarian, C. Minchell; S.S. Editor, D. Waltenberg; Entertainments, L. Ruffell; Club Shop, D. Ruddock; Assistant, R. Bell; Trophy Secretary, R. Cleghorn; Induction Officers: R. Leydon, T. Dixon-Cave.

A WELL attended meeting was held by the **New Forest A.S.** in October. The main item of the evening was a Colour Slide Quiz, operated by Ron Matley of the Bournemouth A.S. During the interval a raffle, organised to help club funds, was followed by an auction of tropical fishes. Table show results:—Characins: 1 and 3, G. Head; 2 and 4, M. Aust. Breeders Trophy: 1, P. Norup; 2 and 3, P. Wheeler; 4, Mrs. Laraman.

OVER 400 entries were received for the **Bristol A.S. Open Show** and the major awards were as follows: Best Exhibit: A. E. Roberts (a team of Orandas). Best Fish in Show: F. Davis (Scaled Fantail). Second Best Fish in Show: J. Whiting (Bristol Shubunkin). This fish also won the Nattermore Trophy and the Award for Best Shubunkin Shown by a Member of B.A.S. Points Cup: A. E. Roberts. Full results were:—Goldfish: 1, L. Menzies; 2, J. Griffiths; 3, R. Pincock; 4, W. G. Ham. Bristol Shubunkin (3 inch): 1 and 4, H. J. Whiting; 2 and 3, W. Leach. Bristol Shubunkins (5 inch): 1, 2, 3 and 4, D. S. Langdon. Veiltails: 1, A. E. Roberts; 2 and 3, T. Sutton; 4, J. Griffiths. Moors: 1, T. Sutton; 2, 3 and 4, W. H. Ramsdon. Telescopes, etc.: 1, D. Headford; 2, H. G. Berger; 3, C. Rupert; 4, R. J. Bennett. Orandas: 1, A. E. Roberts; 2, T. Sutton; 3, A. Lawman; 4, H. G. Berger. London Shubunkins, etc.: 1, 2 and 3, W. Leach; 4, G. Rowley. Fantails, scaled: 1 and 2, F. Davis; 3, J. Linale; 4, T. Sutton. Fantails, calico: 1, C. Rupert; 2 and 4, R. J. Pincock; 3, J. R. Amos. A.O.V. Pond or River: 1, D. Packer; 2 and 3, G. Packer; 4, W. G. Ham. Koi: 1, V. Cole; 2, J. Gay; 3, J. James; 4, C. Hayes. Bristol Shubunkins, 1976: 1, R. Osenham; 2 and 4, V. Cole; 3, A. Churchill. Moors, 1976: 1, T. Sutton; 2 and 3, W. H. Ramsdon. Breeders Bristol Shubunkins, 1976: 1 and 2, B. Rothwell; 3 and 4, V. Cole. A.O.V. Fancy, 1976: 1, 2, 3 and 4, A. E. Roberts. Breeders Veiltails: 1 and 4, A. E. Roberts; 2, T. Sutton; 3, W. H. Ramsdon. Bristol Shubunkins, Matched Pairs: 1, R. J. King; 2 and 4, A. Churchill; 3, B. Rothwell. Novice Shubunkins: 1, R. J. Bennett; 2, J. Day; 3, J. Griffiths; 4, E. Bowden. Furnished Aquaria: 1, A. and R. Bowden. Nationwide Cup for Adult Bristol Shubunkins (at least 3 inch body): 1, H. J. Whiting; 2 and 3, V. Cole; 4, Ramsdon and Rothwell.

IN October the Romford and Becontree A.S. held its annual general meeting when the following members were elected: Chairman, R. Smith; Secretary, D. Ryfield; Treasurer, G. Redding; Show Secretary, R. Jones; Asst. Show Secretary, A. Parsons; P.R.O., J. Carney; Social Secretary, P. Hines; Committee Members G. Septon, T. Ward, M. Moffit. Anyone interested in joining will be made most welcome. Details from J. A. Carney, 109 Wellstead Road, London, E.6. Phone 01-471 7946.

SECRETARY CHANGES
South East London A.S.: S. Howes, 109 Farley Road, London, S.E.6. Tel: 01-697 7222.
Castleford A.S.: F. Holmes, 48 Elmec Road, Ferry Pryston, Castleford, Yorks.
Yeovil and District A.S.: J. Byron, 9 Ivy Walk, Handford Gardens, Yeovil. Tel: Yeovil 25976.
Nelson A.S.: Mrs. I. R. Bell, 12 St. Philips Street, Nelson, Lancs. BB9 9XU.
Bletchley and District A.S.: Mrs. M. Brazier, 28 Oakwood Drive, Bletchley, Milton Keynes.

NEW SOCIETY
The Oxley and District A.S. has been formed recently and meet fortnightly at the Community Centre, Marsh Lane. Anyone interested in joining should contact Mrs. C. A. Currier, 2 Ingestre Road, Fordhouses, Wolverhampton, Staffs. WV10 6SN, when a programme with full details will be sent.

AQUARIST CALENDAR
19th December: Village Bar A.S. open show, Birmingham. Details from show secretary, 81 Barston Road, Oldbury, West Midlands B68.

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13th February: Sheaf Valley A.S. Open Show will be held in the Dormer Twist Drill Ltd. Canteen, Cemetery Road, Sheffield. Benching 12.00 noon till 2.00 p.m. Details from Show Sec.: Mr. B. Moore, 57 Nicholson Road, Sheffield 8 or Tel.: 662382.

17th April: Nelson A.S. Annual Open Show at the Civic Centre, Stanley Street, Nelson. Details from R. McKenna, 52 Bath Street,

Nelson, Lancs BB9 6NP.

24th April: Blakeborough A.S. Open Show: Further details later.

8th May: Bolton Gunners A.S. First Annual Open Show.

22nd May: Middleton and District A.S. 6th Open Show. Two shows in one! Tropical Section: 34 Classes, Coldwater Section 11 Classes. At the Civic Hall, Middleton (M.62—Exit 19).

26th June: Alfreton and District A.S. Annual Open Show at Alfreton Hall. Details and Show Schedules available later. P. W. Benson, 10 George Street, Riddings, Derbyshire DE5 4GF.

27th-29th August: Tyne Tees Association of Aquarist Societies second exhibition of fish-keeping at Lambton Pleasure Park, Chester-le-Street. The Three Rivers Championship will be included in the programme. Further details available at an early date.

CHAMPION OF CHAMPIONS Competition Results



1st
K. Blades
Pumpkinseed Sun Bass
Bassetlaw

2nd
S. Wolstenholme
Aulonocara
Heywood

3rd
G. Bond
Red Devil
Southport

RESULTS OF OTHER FESTIVAL COMPETITIONS

Society Tropical Furnished Aquarium: 1, Northwich, 66 pts.; 2, Halifax, 61 pts.; 3, Southport, 47 pts. Society Coldwater Furnished Aquarium: 1, Halifax, 67 pts.; 2, Bury, 60 pts.; 3, Northwich, 57 pts. Individual Tropical Furnished Aquarium: 1, J. Roberts (Northumbrian), 75 pts.; 2, Mrs. B. Barnes (Bury), 55 pts.; 3, A. P. Vassiere (Merseyside), 51 pts. Individual Coldwater Furnished Aquarium: 1, D. Shields (Halifax), 71 pts.; 2, D. Glen (Bury), 52 pts.; 3, L. Bradley (Northwich), 56 pts. Aquascapes: 1, H. Penhall (Oxram), 50 pts. Novelty Aquascapes: 1 and 2, E. Seymour (Merseyside), 72 pts.; 3, J. H. Haslam (Belle Vue), 62 pts. Common Goldfish and Comets: 1, D. Wolstenholme (Blackburn), 71 pts.; 2, E. Seymour (Merseyside), 70 pts.; 3, G. Bond (Southport), 68 pts. Shubunkins (Bristol and London): 1, 2, and 3, R. Rothwell (N.G.P.S.), 68 pts.; 87 pts.; 64 pts. Moors: 1, W. Ramsden (N.G.P.S.), 67 pts.; 2, F. Foots (Accrington), 65 pts.; 3, H. Penhall (Oxram), 63 pts. Veiltails: 1, 2 and 3, P. Johnson (N.G.P.S.), 67 pts.; 63 pts.; 62 pts. A.O.V. Fancy Goldfish: 1, J. S. Hall (Aireborough), 76 pts.; 2, C. Barlow (Oxram), 71 pts.; 3, H. Penhall (Oxram), 70 pts. A.O.V. Coldwater: 1, J. S. Hall (Aireborough), 57 pts.; 2, H. Penhall (Oxram), 55 pts.; 3, R. Fisher (N.G.P.S.), 52 pts. Guppy (Single): 1, R. Neworthy (Northumbrian), 66 pts.; 2, W. D. Hunt (Thorne), 62 pts.; 3, T. Redfern (Heywood), 57 pts. Guppy (Pairs): 1, J. Nimmo (Lanarkshire), 54 pts.; 2, S. Stevens (Isle of Wight), 48 pts.; 3, J. Roberts (Middleton), 44 pts. Livebearer A.V. (Single): 1, Mr. and Mrs. R. Houghton (Southport), 75 pts.; 2, S. Green, Jr. (Castleford), 74 pts.; 3, T. Horrocks (Oxram), 70 pts. Livebearer A.V. (Pairs): 1, M. Strange (Basingstoke), 73½ pts.; 2, Mr. and Mrs. Baldwin (Sandgrounders), 70 pts.; 3, R. Neworthy (Northumbrian), 69 pts. Angel (Single): 1, Mr. and Mrs. Muckle (Southport), 74 pts.; 2, J. K. Davies (Northwich), 67 pts.; 3, R. Neworthy (Northumbrian), 66 pts. Angel (Pairs): 1, Mr. and Mrs. D. Greenhalgh (Bury), 57 pts. Dwarf Cichlids (Single): 1, B. Bamber (Southport), 78 pts.; 2, G. Barnes (Bury), 70 pts.; 3, G. Poole (Halifax), 69 pts. Dwarf Cichlids (Pairs): 1, B. Bamber (Southport), 63 pts.; 2, Mr. and Mrs. K. B. Agar (Aireborough), 60 pts.; 3, R. Clayton (Belle Vue), 55 pts. A.O.V. Cichlids (Single): 1, J. Ridley (Heywood), 79 pts.; 2, G. Bond (Southport), 72 pts.; 3, J. B. Rowley (Bury), 69 pts. A.O.V. Cichlids (Pairs): 1, J. Royal-Evett (Aireborough), 55 pts. Fighter (Single): 1, H. Buckley (Northwich), 65 pts.; 2, T. Davies (Heywood), 61 pts.; 3, B. Faux (Merseyside), 59 pts. Gouramies and Paradise A.V. (Single): 1, L. Thorne (Northwich), 62 pts.; 2, M. Hunt (Blackburn), 58 pts.; 3, R. A. Johnson (Hyde), 57 pts. Gouramies and Paradise A.V. (Pairs): 1, L. Newton (Blackburn), 61 pts.; 2, R. Mather (Northwich), 58 pts.; 3, E. Williams (Lanarkshire), 56 pts. Barbs A.V. (Single): 1, R. Tomkinson (Glossop), 74 pts.; 2, Mr. and Mrs. Holmes (Castleford), 72 pts.; 3, R. Blight (Basingstoke), 66 pts. Barbs A.V. (Pairs): 1, J. Davison (Northumbrian), 68 pts.; 2, R. Blight (Basingstoke), 66 pts.; 3, McIlride Family (Aireborough), 63 pts. Characins A.V.

(Single): 1, K. Thompson (Merseyside), 76 pts.; 2, G. Brown (Northumbrian), 73 pts.; 3, P. Smith (Northwich), 72 pts. Characina A.V. (Pairs): 1, R. Stevens (Blackburn), 74 pts.; 2, A. Buckley (Bury), 73 pts.; 3, W. Bennet (Lanarkshire), 71 pts. Carps or Minnows (Single): 1, Mr. Thickbroom (Castleford), 70 pts.; 2, Mr. and Mrs. Holmes (Castleford), 68 pts.; 3, W. Hayes (Loyne), 66 pts. Carps or Minnows (Pairs): 1, V. Davison (Northumbrian), 70 pts.; 2, L. Thorne (Northwich), 67 pts.; 3, A. Buckley (Bury), 63 pts. Catfish A.V. (Single): 1 and 3, A. Blake (Basingstoke), 80 pts.; 76 pts.; 2, T. Sanderson (Thorne), 77 pts. Catfish A.V. (Pairs): 1, A. Blake (Basingstoke), 72 pts.; 2, S. Phillips (Belle Vue), 71 pts.; 3, E. Williams (Lanarkshire), 65 pts. Egg-laying Tooth Carps (Single): 1 and 3, G. Wood (B.K.A.), 71 pts.; 60 pts.; 2, S. Gendry (Middleton), 69 pts. Egg-laying Tooth Carps (Pairs): 1, K. Blades (B.K.A.), 71 pts.; 2, A. Bennett (B.K.A.), 66 pts.; 3, S. Barratt (B.K.A.), 60 pts. Loach A.V. (Single): 1 and 3, Mr. and Mrs. Danby (Hyde), 66 pts.; 64 pts.; 2, R. Tomkinson (Glossop), 65 pts. A.O.V. (Single): 1, A. Rothwell (North Staffs.), 78 pts.; 2, J. and G. Waterhouse (Sandgrounders), 75 pts.; 3, S. Stevens (Isle of Wight), 73 pts. Breeders (Egg-layers 1-5): 1, J. Ridley (Heywood), 63 pts.; 2, A. Gabbott (B.K.A.), 56 pts.; 3, R. Clayton (Belle Vue), 51 pts. Breeders (Egg-layers 6-10): 1, R. Buckley (Bury), 64 pts.; 2, G. Poole (Halifax), 61 pts.; 3, J. S. Hall (Aireborough), 60 pts. Breeders (Egg-layers 11-15): 1 and 2, A. P. Vassiere (Merseyside), 79 pts.; 76 pts.; 3, B. Boyden (Chesterfield), 73 pts. Breeders (Egg-layers 16-20): 1, M. Strange (Basingstoke), 77 pts.; 2, K. Blades (B.K.A.), 75 pts.; 3, A. P. Vassiere (Merseyside), 70 pts. Breeders (Livebearers 1-10): 1, A. Buckley (Bury), 65 pts.; 2, M. Strange (Basingstoke), 59 pts.; 3, A. Wetherpoon (Lanarkshire), 55 pts. Breeders (Livebearers 11-20): 1, 2 and 3, M. Strange (Basingstoke), 84 pts.; 77 pts.; 70 pts. Breeders (Coldwater): 1 and 3, W. Ramsden (N.G.P.S.), 69 pts.; 64 pts.; 2, E. Rothwell (N.G.P.S.), 67 pts. Plants: 1, A. Beasley (Bury), 62 pts.; 2, R. Clarkson (Thorne), 57 pts.; 3, J. Bennet (Lanarkshire), 56 pts. Marine Furnished Aquarium: 1, A. Henshaw (Belle Vue), 71 pts.; 2, B. Banks (Thorne), 70 pts. Marine Fish (Single): 1, 2 and 3, K. Smith (Middleton), 67 pts.; 63 pts.; 59 pts. Special Awards: Best Fish in Show: A. Blake (Basingstoke), 80 pts. Best Tropical Fish: A. Blake (Basingstoke), 80 pts. Best Coldwater Fish: J. S. Hall (Aireborough), 76 pts. Best Pair of Fish: R. Stevens (Blackburn), 74 pts. Best other than Best in Show: Tropical Egg-layer: J. Ridley (Heywood), 79 pts. Tropical Livebearer: Mr. and Mrs. R. Houghton (Southport), 75 pts. Coldwater: J. S. Hall (Aireborough), 76 pts. Most Attractive Stand: 1, Southport; 2, Thorne; 3, Oxram; 4, Castleford. Individual Exhibitor with Most Awards: M. Strange (Basingstoke). Exhibitor with Most Cards in Breeders Section: M. Strange (Basingstoke). Competing Societies Draw: Southport. Champion of Champions: 1, K. Blades (Bassetlaw) (Pumpkinseed Sun Bass); 2, S. Wolstenholme (Heywood) (Aulonocara); 3, G. Bond (Southport) (Red Devil).