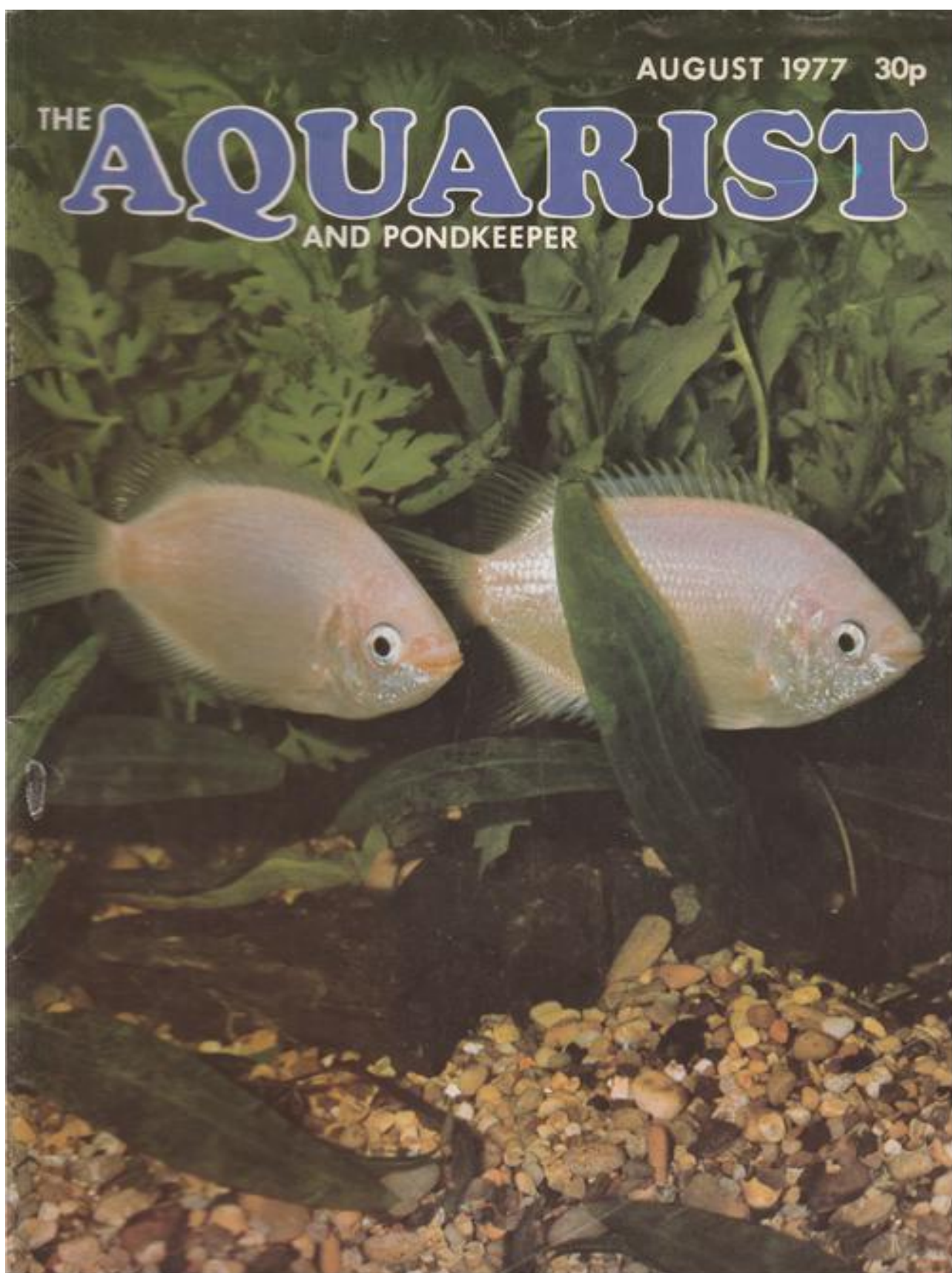


AUGUST 1977 30p

THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

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THE COLOURFUL "LIMIAS"

by Barry Durham

I OFTEN wonder why certain fish are handled by importers and shops when others seem to get the cold shoulder—especially some of the 150-odd species of livebearers. The excuse is usually that they are drab or colourless or uninteresting or there is no demand. This may be partly true, yet such specimens as Blind Cave Characins (which to me are pink, obnoxious looking individuals) or the Glass Fishes (what could have less colour!) are stocked. Yet go and ask for a Blue Limia, a Mosquito Fish or Halfbeak, all of which are either attractively coloured or interesting in their own way, and you are met with blank stares and a shake of the head that indicates that the shop owner either doesn't know what you are talking about, or thinks you must be mad to want anything other than a guppy, mollie, swordtail or platy, or both!

Occasionally, very occasionally, you do come up trumps when the shop owner has perhaps taken a chance on a batch of local bred fish, but I believe that if some of the rarer livebearers were stocked by shops in greater numbers they would increase in popularity.

Several fishes that could become popular if given the chance are those that once belonged to the genus "Limia." This has now been suppressed to a sub-genus and the eleven species concerned are now classed as "Poecilia" along with the mollies and the guppy. Six of them can be obtained in the U.K., if you know where to look.

These six are the most colourful of the "Limias"—a name which will no doubt be retained by aquarists for many years to come, despite its official suppression—and all make perfect community tank inhabitants.

Taking them alphabetically, they are: *Poecilia caudofasciata* (Blue Limia), *P. melanogaster* (Blackbellied Limia), *P. nigrofasciata* (Hump-back Limia), *P. ornata* (Ornate Limia), *P. versicolor* (Olive Limia) and *P. vittata* (Cuban Limia). Of the other five members of this little "family," very little is known about *P. dominicensis* and *P. perugiae*, and *P. heterandria* (Dwarf Limia), *P. melanonotata* and *P. nicholsi* (Yellow Limia) have only been rarely kept in aquaria since their discovery in the early years of this century.

I cannot explain why these fish are generally unavailable through the shops, but I can perhaps persuade you that they should be. All will eat almost any food,

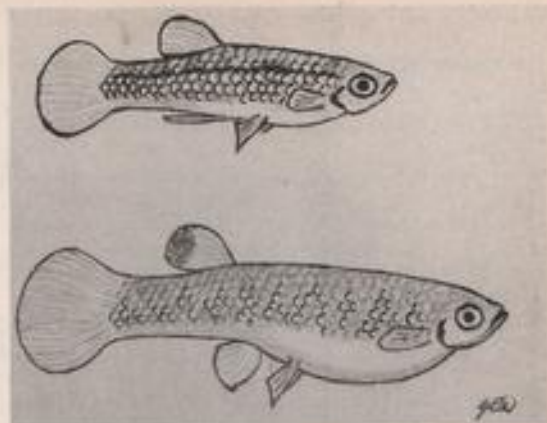
they have a temperature range in the upper seventies Fahrenheit, are easily bred and have a quiet temperament. Some of them are very colourful, others less so. But what those others lack perhaps in colour they make up for in other ways like the strange shape of the adult Hump-back Limia or the well spread tail and large dorsal fin of the male Cuban Limia.

All of the Limias are found on the islands of Cuba, Santo Domingo or Jamaica in the Caribbean Sea with only one species, *P. heterandria*, being found on the mainland. This species was first discovered in Venezuela, but it now seems likely that it inhabits Haiti and the Dominican Republic on the island of Santo Domingo as well. Santo Domingo has by far the greatest number of Limias with ten of the species inhabiting either Haiti or the Dominican Republic. Jamaica and Cuba lay claim to just one each. Maybe this island isolation is one of the reasons why so few of these lovely fishes find their way into our aquariums.

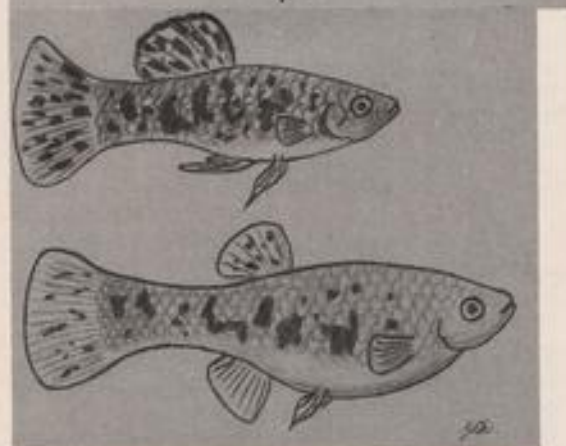
Nearly all the Limias appear bluish in reflected light and some of them exceptionally so. Take the Blue Limia (*P. caudofasciata*) for example. A fish described by the late Dr. William T. Innes in "Exotic Aquarium Fishes" as "... flecked with blue fire." The male is indeed beautiful to behold, as though its brownish green sides had been liberally sprinkled with sapphires. Against the dark background its metallic scales stand out brilliantly. There is a faint dark longitudinal line running along the body and the dorsal fin in the best specimens is a bright orange, with a touch of orange also evident in the tail. The male also has a pale gold belly and both sexes have gold eyes.

The female is generally a darker brownish olive with dark borders to the scales. The brilliant blue-green dots are not as prominent as on the male but are still enough in evidence to make it an attractive fish. The fins are generally colourless apart from a dark spot on the rear of the dorsal fin.

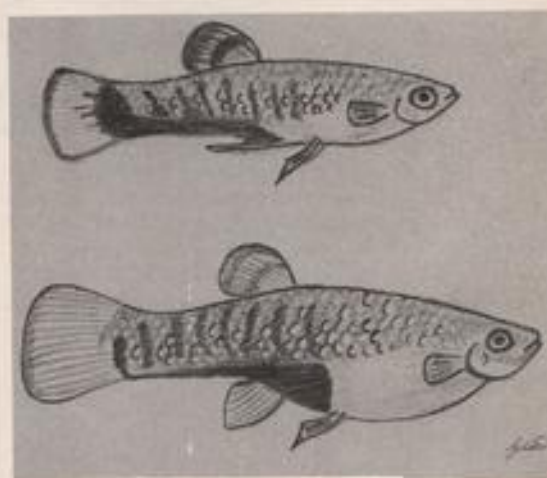
Their one real drawback is that they can be prone to eat their own young (but this is true of many livebearers) so the breeding tank should be well stocked with fine-leaved plants to afford the ten to sixty young which are born at about five weekly intervals plenty of cover. The species will breed, and live quite



Left: Hump-backed Limia
Above: Blue Limia



Cuban Limia



Black-bellied Limia

comfortably, anywhere between 72 and 79° F (22-26° C). If well fed the young fish grow rapidly and are sexually mature at two to three months. They will eat live and dried foods and like some algae in their diet. The males attain a size of 4 cms (1½ in.) and the females 6.5 cms. (2½ in.).

While not possessing the "blue fire" of the Blue Limia the Black-bellied Limia (*P. melanogaster*) is still an attractive fish. It too is blue, but this time the colour overlays the basic olive brown body with a steady steely iridescence that once again looks its best in reflected light. The black which gives the fish its common name appears as an overlarge and permanent "gravid spot" on the female, and a dark patch which extends from the anal fin of the male on the lower half of the body right up to the caudal peduncle. Here it spreads and darkens into an almost triangular

shaped marking over the whole of the base of the tail. Only when the fish is excited does this dark marking become really black. The rear half of both sexes is also marked with six to eight dark transverse bands.

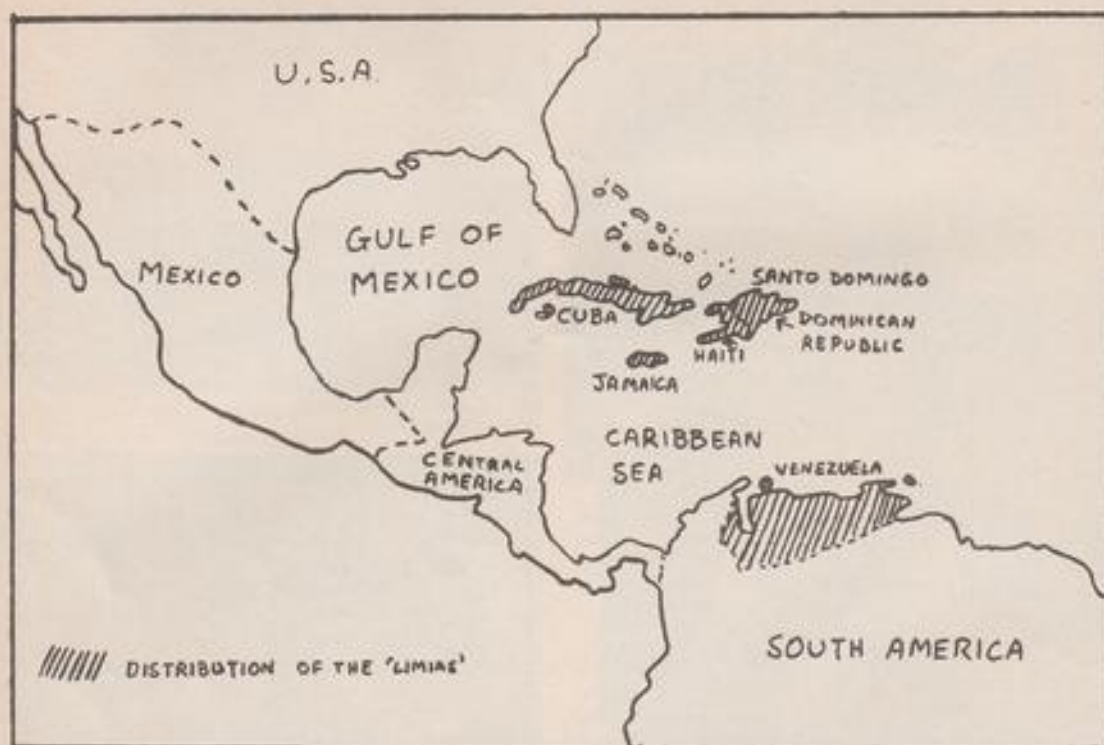
The fins of the male are yellowish with the dorsal attractively marked with a black border and a black band running parallel to it close to the base. Similar markings are evident on the caudal fin, where the triangular marking on the peduncle extends a short way on to the fin itself.

As the males get older the throat and belly take on a lovely orange colour contrasting beautifully with the darker coloration of the rest of the fish.

The females in general are similarly coloured to the males, but not as intensely and they do not develop the orange throat with age.

They are easily cared for, eating almost anything,

SKETCH MAP SHOWING THE DISTRIBUTION OF THE "LIMIAS"



live, dried and vegetable, and growing to a similar size to the Blue Limia (4 cms. males, 6.5 cms. females). They will live quite happily at 72 to 79°F (22-26°C), but need a slightly higher temperature for breeding: 77 to 82°F (25-28°C). If kept at this temperature the female will produce broods of 20 to 25 young at approximately seven week intervals. As they like plenty of open water, the plants in the breeding tank, and indeed in their normal living quarters, should be arranged in clumps around the sides and back of the tank. If the aquarium is planted in this way with plenty of fine leaved plants it is not absolutely necessary to move the female to separate breeding quarters as very few of the fry will be eaten.

How about a fish which, as it gets older, undergoes a transformation not only of colour but also of body and fin shape as well? The male Hump-back Limia does just that. When young he is quite long and rounded; his fins are quite generous and also rounded, especially the dorsal. His colour is olive green to brown, with that bluish overtone again, and his sides are marked with eight to twelve black vertical bars. Sometimes the areas between the bars are also marked with irregular streaks or blotches. The back is dark and

the belly yellowish-white. The scales on his sides, especially under the head and on the front part of his body, bear a bright yellow-green dot giving a beautiful spangled effect, and all the scales are edged in black adding a network-like covering over everything. The fins are yellowish coloured, the dorsal bears streaks and dots of black and the tail has a dark border.

The female is very similarly coloured and indeed the two sexes are very hard to tell apart until the males begin to attain sexual maturity at a size of about three to three and three and a half centimetres long (1¼ to 1½ in.). Then, as the gonopodium begins to fully develop at close to a year old, the transformation really begins.

While the female retains her soft roundness the male becomes very much slimmer. The body deepens, or rather the back becomes taller so that the depth of his body is now around half his length. His forehead now rises much steeper than before to the top of his back so that when he is fully grown he looks almost as though his spine were bent. This is not so, however. As his back begins to hump so his dorsal fin grows even bigger and more rounded and his already lovely colours intensify. His whole body

becomes a bright greeny-bronze colour with the lower half almost a shining lemon yellow.

The bright scale spots and the dark bars stand out prominently and eventually the throat, belly, gonopodium, dorsal and ventral fin rays turn a deep black. His final size may not exceed 4.5 cms. (1½ in.), but what he lacks in this respect he more than makes up for with his shape and colour. His mate grows a little larger attaining a size of six to seven centimetres (2½-3 in.).

They are, like all the "common" *Limias*, easily cared for liking live food and algae, but they will take dried food as well. They like a well planted tank with a water temperature of 72 to 79°F (22-26°C) and some sunshine to promote the growth of algae which they love. To breed, the temperature should be raised to 77 to 82°F (25-28°C) if possible and the female will produce 20 to 50 young every six to ten weeks depending on her size.

The young are larger than most livebearers when born and are uniformly grey with only faint dark bars. They are not quick growers, however, and this fact could put one or two people off breeding them. They colour up fairly quickly but can take up to a year to reach sexual maturity and it is not until this happens that the males begin their transformation. It is, nonetheless, well worth waiting to watch.

Poecilia ornata or the Ornate *Limia* is a little harder to come by, but if you are offered some then don't hesitate because this is indeed a lovely fish.

Once again, give this fish a well planted aquarium, especially a community one with mild-mannered fishes in it, and it will lose its temerity and you will see it at its best. Place the aquarium where it catches the sun and you will be able to see just why this fish is termed "ornata." It will glisten and sparkle as the brilliant silvery-green edges to its scales reflect the light.

They are average *Limia* size with the males growing no bigger than 4 cms. (1½ in.) and the females 6 cms. (2½ in.). The basic body colour is dark olive, a little paler on the belly. There are black spots over much of the body and sometimes a few irregular dark stripes running from just behind the gills to the caudal peduncle. And of course there is that brilliant edging to the scales. The fins are colourless, or nearly so, except for a few dark markings in the dorsal and the female's anal fin.

Another algae loving species, they will also take live and dried food and prefer a temperature range of 75 to 79°F (24-26°C). This should be raised to a little over 80°F (27°C) for breeding. The broods are small, between six and thirty, but the youngsters themselves are quite large being about a centimetre long (½ in.).

Like most of the *Limias* *P. versicolor* (Olive *Limia*) is best seen in reflected light, but it is still quite attractive under normal lighting conditions. Both

sexes are a dark brown with olive green overtones, growing paler on the underside.

The male is, as usual, slightly darker than the female and there is that almost compulsory row of dark bars on the sides (this time ten to twelve) extending as far as the base of the tail. In reflected light his colour changes completely and his body becomes dark blue sprinkled with bright green dots.

The female does not undergo quite such a startling transformation, although the two pale stripes running from gill cover to tail do tend to disappear as her body takes on its bluish sheen. The "emerald spangling" which adorns the male is not so intense and is sometimes confined to the rear half of her body, including the tail.

The fins of both sexes are pale yellow, sometimes almost colourless. The females carry a dark curved stripe on the rear part of the dorsal, but this marking is only very faint on the males and is sometimes missing altogether.

Once again they do not grow bigger than 4.5 cms. (2 in.) for full grown males, and a little over 6.5 cms. (2½ in.) for full grown females. They can be quite timid and prefer a well planted tank and higher temperatures than is usual: 77 to 82°F (25-28°C). They will breed quite readily at this temperature with broods of about 20 young being delivered every five to six weeks. They prefer live food as much as possible and are probably best started on newly hatched brine shrimp before graduating to finely chopped *tubifex* worms.

The adults will take almost anything although, like all the *Limias*, they do need algae, or green food substitute in their diet if they are to be always at their best.

In a way it is a pity that the most easily obtainable of all the *Limias*, *P. vittata*, the Cuban *Limia*, is the least colourful, because this may have put some aquarists off trying to obtain other members of the subgenus.

They do occasionally appear in the shops, but as they take quite a while to sex out (around four to four and a half months) this could be one of the reasons why they are not often stocked. It is difficult under these circumstances to buy pairs and the best bet is probably to buy four or six fish and raise them to maturity yourself. This usually takes place when the males are around 5 cms. (2 in.) in length. The gonopodium starts to form and he is then unlikely to grow more than an extra centimetre (¼ in.). The females, however, carry on growing until they are about 10 cms. (4 in.), although they will produce their first brood when a couple of centimetres smaller.

The male is the more colourful of the sexes although the colours in general are more subdued than other members of the *Limia* "family." The ground colour of the body is usually olive grey, blending into gold on the belly. Irregular black blotches pattern his sides,

Sizes, distribution and breeding details of the "Limias"

Name	Distribution	Size (M)	Size (F)	Temp. Range	Breeding Temp.	Gestation (weeks)	Size brood
<i>P. caudofasciata</i> (Blue Limia)	Jamaica	4 cms	6.5 cms	72-79° F	same	4-6	10-60
<i>P. dominicensis</i>	Haiti, Santo Domingo	4 cms	6 cms				
<i>P. heterandria</i> (Dwarf Limia)	Venezuela, Haiti, S. Dom.	2.5-3 cms	5 cms	72-79° F	same	4-6	20-50
<i>P. melanogaster</i> (Black-bellied Limia)	Jamaica, Haiti	4 cms	6.5 cms	72-79° F	77-82° F	6-8	20-25
<i>P. melanonotata</i>	Haiti	4 cms	6 cms				
<i>P. nicholsi</i> (Yellow Limia)	Dominican Republic	4.5 cms	5.5 cms	72-79° F	same		
<i>P. nigrofasciata</i> (Hump-back Limia)	Haiti	4-4.5 cms	6-7 cms	72-79° F	77-82° F	6-10	20-50
<i>P. ornata</i> (Ornate Limia)	Haiti	3.5-4 cms	6 cms	75-79° F	82° F	5-7	6-30
<i>P. perugiae</i>	Haiti	3 cms	5 cms				
<i>P. versicolor</i> (Olive Limia)	Haiti, Cuba	4.5 cms	6.5 cms	77-82° F	same	5-6	15-20
<i>P. vittata</i> (Cuban Limia)	Cuba	6 cms	10 cms	68-75° F	75-79° F	3-5	30-100

Notes: All the "Limias" come from slow flowing or still waters, usually small rivers and streams. Only *P. vittata* may be found in brackish water.

All will take live and dried food, but need algae or other vegetable matter in their diet if they are to prosper.

interspersed with spots of gold which seem to have seeped up from his belly. Specimens are also known where the entire ground colour is brassy yellow, and others are more brown than grey. Once again reflected light produces something of a transformation, this time suffusing the body of the fish with steel blue.

On the darker specimens there are two rows of faintly metallic scales above the lateral line and all the scales are edged in darker colour producing a faint reticulated pattern over the sides as far as the top of the belly. As the male grows older and reaches full sexual maturity, so his dorsal fin enlarges to over twice its normal size and becomes marked over about two-thirds with brilliant white with many small black spots and blotches which may run together at the edges to outline the fin. It is irregular in outline and when he spreads before his female of the moment it looks quite attractive.

The fairly large caudal fin also becomes spotted as he gets older, but here the background colour is yellow, and this yellow colour seems to intensify the more algae the fish gets to eat. The other fins are colourless.

The female also has the netted appearance on her body from the darker edged scales as well as the faintly metallic stripes and the blue colour in reflected light, but the black blotches and yellow spots which adorn the sides of her mate are not nearly so numerous. Her dorsal fin remains small and shows very little colour apart from a few black streaks or blotches. The tail is also without much yellow coloration and has less black markings. The body is much fuller and deeper than the male, but the gravid spot does not appear at all, even when she is ready to deliver.

Unlike most of their near relatives, the Cuban Limias prefer a slightly cooler temperature of around 70-75° F (21-24° C), but with a breeding temperature of 75-79° F (24-26° C) can quite easily be kept in a Limia "community" of around 76° F. They prefer a varied diet of live, dried and vegetable foods and will breed quite readily, being the most prolific of all the Limias. As the parents are not particularly cannibalistic, a separate breeding tank is not necessary providing there are several clumps of fine leaved plants, or a mat of

Continued on page 197

WHAT IS YOUR OPINION?

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

Photographs by the Author



A COUPLE of weeks ago I purchased three more fancy goldfish to provide company for the single fish that has been the sole occupant of one of my tanks for several months. A photograph of the latter fish appeared in last month's *Aquarist*. Unfortunately, a few days later, white spot appeared on one of the new fish, and on the older one. This was treated and the spots disappeared rapidly. Sadly, when I looked in the tank this morning, I discovered that the new fish that had contracted white spot was dead. Its fins were badly chewed and I would certainly not attribute its death to white spot, a disease that can be easily cured. When the three new fish were introduced into the aquarium, the larger, older inhabitant took an aggressive, spawning interest in the fish that first contracted white spot—both fish were of the same variety—and I think that the older fish must have hammered the life out of the younger one because it was smaller and not in breeding condition. Certainly my recent experiences with fancy coldwater fish tend to indicate that those reaching my part of the country are not in the best of health. This disappoints me as it is a good many years since I last kept any fancy goldfish. The three surviving fish seem to be in good condition and I'm hoping that they will thrive. What is your opinion of the quality of recently imported fancy coldwater fishes?

About twenty-five years ago, when I had set up my fourth tropical aquarium, I was a young schoolboy who didn't know much about wiring up aquaria. A friend took pity on me and made me an excellent little junction box into which I was able to plug four heater/thermostat combinations, lights, and an air pump to supply the battery of four tanks. The neat little unit was discreetly fitted beneath the stand that held the largest tank. When I returned home from school several days ago and attempted to switch on my aquarium lights there were several flashes and bangs and the fuse in the plug supplying electricity to the junction box fused. After a couple of investigations and several blown fuses I discovered that the top tank had obviously sprung a leak during the past week or two, and the water had dripped down into the junction box. I had to take the box to pieces and remove the female connector sockets; after drying the latter I joined up the wires again and, leaving the pieces of

the wooden box out in the sun to dry, switched on the current. Things started to operate again and I noted that the temperature in the four tanks had dropped from 80° to 65°F. Fortunately no harm appears to have been done—no doubt because, during the day, the hot sun had kept the room and the tanks quite warm enough to cause little harm. I'll now have to take the leaking tank apart and seal it inside with a silicone rubber sealant. I can't really complain about the tank in question as it was the first aquarium I ever bought and it has been in continuous use for about twenty-seven years. Its alloy frame is still as good as the day on which it was bought. My only disappointment will be that I'll have to remove all the thriving plants—including the strong growths of Java moss, samples of which I've been sending to those readers who took up my offer and enclosed a couple of stamps to cover postage and packing. I regret that I was unable to send samples to those who did not enclose the requested stamps. The increasing costs of postage simply mean that I cannot afford to send Java moss to those who are unwilling to pay for postage and packing. Assuming that the plants will grow as well in the old aquarium when I get it set up again—and this does not necessarily follow—I'll still be prepared to send a starter sample of Java moss to anyone who sends me a couple of 9p stamps. Again, it'll have to be a case of first come first served.

Readers are reminded that I no longer have time to send individual replies to readers' queries; such queries should be addressed to either Mr. Boarder or Mr. Hems, as appropriate, and a s.a.e. enclosed for a reply. A couple of points of information: recently several people wrote to me asking for Chris Lovell's prize-winning tip about the keeping of earthworms to provide fish food. Unfortunately I'm unable to help here. I typed Chris's letter in my copy for the May edition and, after doing so, destroyed the letter. (I receive so many readers' letters for this feature that I do not have the space to store them after I have typed them for my monthly feature.) Unfortunately Chris's letter must have been edited out due to lack of space in the May issue; and I have no record of his tip or his address. If I remember correctly, his tip was to keep and breed earthworms in a tea-chest, thus providing a supply when the garden was either frozen hard, or

baked hard by the sun. If Chris Lovell reads this I should be pleased if he'd send me the tip again, together with his address, so that I can publish it in full in a future feature.

Readers are also reminded that I don't write the letters in this feature; I merely edit them and type them each month. I supply this information because, occasionally, readers write to me asking for further details about something that has appeared in a reader's letter in this feature. Obviously I don't have any information additional to that contained in the letters I publish; however, I always print as much as possible of each letter so that readers will learn as much as I do; and I publish the full name and address of each letter writer so that anyone wishing to obtain additional information can write directly to the person who wrote the original letter. If you require additional information about the contents of any letter published in this feature, please write directly to the person whose name and address appears with the published letter. He or she should be able to answer your queries about the specific subject(s) in question.

Mr. Brian W. Myers wrote to me from 7 Merlin Drive, Ely, Cambs. He had the following to say: "... The January issue of *The Aquarist* contained an article by Bob Purdy about the family *Goodeidae* and I thought... you might be interested to hear that I have been breeding *Ameca splendens* since December 1976. I acquired 20 of this rare breed at that time and it was indeed a coincidence that the article followed so soon afterwards. My breeding stock consisted of 12 females and 8 males, and the colourings are similar to the description given by Bob Purdy except that both are decidedly silver, with purple-pink blotches. The female is more spotted than blotched, silver grey on top with a silver-white underbelly, and the tail has black ribs extending like a fan from the black spotted body.

"The caudal fin of the male is indeed a feature, glowing like a brilliant black and yellow striped flag. The behaviour pattern of the fish is one of intense activity at all water levels. It is most inquisitive towards movement, both inside and outside the aquarium and all the fish shoal towards a face or finger in a flurry of movement. In contest, the males adopt a vertical spiralling attitude, nose down, twisting and writhing around each other; in courtship the antics are not dissimilar but not as prolonged. Apart from the nature of the fish, which makes it so attractive, it is a prodigious eater of algae. The tank gravel is as clean as the day it was first put in; but no attempt has been made to eat the plants which are plentiful and of a common type.

"I found the fish live happily with all other species except sailfins, which they continuously worried until they lay inert among the foliage. At the moment they are housed as a species in a 48 in. x 15 in. x 15 in. tank. The most remarkable feature, however, must

be the reproductive pattern of the species. The first time I saw 8 baby fish I thought I had omitted to remove some blue platties from the tank; then I saw the colouring and noted the spots and realised that these $\frac{1}{2}$ in. fish had just been born. The female, which had looked like a submarine about to burst her torpedoes for days, was flipping round the tank like a deflated balloon. After birth the females are a pitiful sight; but within a week they are back to their normal shape.

"After six months I can confirm that the new-born fish are fully $\frac{1}{2}$ in. long, and the brood is never more than 10 per female, with 8 being the norm. So far, 90 new fish, with three still-born, have been produced, so the breed will never saturate the market. The young ones grow fairly quickly, attaining 1 in. after a month, and thereafter the female reaches 2 $\frac{1}{2}$ in. and the male 1 $\frac{1}{2}$ -2 in. They take all food avidly from the surface and the bottom, and there is never any residue on the bottom at the next feeding time. I thoroughly recommend this fish to any enthusiast, new or old. The experienced keeper will take delight in finding a fish not quite like any other. P.S.—Please note that I breed fish commercially as an aside, and have experience of many breeds. At the moment I specialise in the *Amecas* and blue *acaras*—which are not as easy as some would make out; the losses are heavy even if the hatchings are large—and am moving on to rarer types now, such as *Julidochromis* and *Lamprologus*."

Photograph 1 shows the dwarf gourami, *Colisa lalia*. Please send me details of your experiences in breeding this attractive species.

Mr. Ken Swan lives at 5 Daywell Rise, Rugeley, Staffs. He writes: "It seems we are unable to escape this continuous barrage of hot air about tableaux shows. I have religiously read in your feature the comments of the 'Yes-sers' and 'No-ers' and feel now is the time to have a say. If you like tableaux shows then show your fish at them; if you don't then I feel you must agree that there are plenty of shows where you can 'exercise' your fish. To me bench shows are the best because all the classes are separate and comparisons easier, this making clear to all why your pride and joy is unplaced. However, I must agree that to the curious and uninitiated the tableaux shows are more of a spectacle. Finally, I would like to ask those planning shows to consider all the smaller clubs who have little cash and few handymen in their numbers—like ours. Keep up the good work with your article."

No. 27 Crofton Road, North End, Portsmouth, Hants., is the address that heads the following letter, received from Mrs. Sue Whittenham. "... As I've only had my tropical tank set up for a short time—up until now I've been strictly a coldwater fishkeeper—my opinion doesn't carry much weight, but I've found my combined heater/stat both useful and efficient. It's a

(Dorking-made) model and keeps the water at a constant 75 F. I decided initially on the combined unit because, as a novice tropical fishkeeper, I'm a bit wary of electrical wiring near water. I find my combined unit very satisfactory in its performance.

"There are two aquarists' shops in my area from which I buy my fish and accessories. I have been going to these shops for three years now—initially because they are the only two places I know which stock a reasonable selection of fancy goldfish, and latterly because I find they offer a good selection of healthy fish. At (one shop) in particular they stock a wide range of equipment and accessories and should a novice aquarist have a query about his fish or equipment the staff are always willing to advise."

Mrs. S. B. Davis, whose home is at 16 Round Hill,



Stone, Aylesbury, Bucks., sent me the following letter from hospital. "A few months ago I bred from a fantail guppy. The result was about 40 babies; but two of the young were joined at the stomach for about 12 hours. I have never heard of or seen this before. I still have one of the pair that lived, but cannot see any difference in it. I have bred hundreds of guppies but the female parent died soon afterwards." (I hope you are now well and out of hospital, Mrs. Davis.)

Master R. Milnes is 14 years old and resides at 42 Moughland Lane, Runcorn, Cheshire. He writes: "My topic is the killing of fishes that are ill or dying. The first method that I stumbled across was the use of soluble aspirin. 'Why couldn't fish die of an overdose as well as humans?' I thought; so, I put an unwanted guppy into a glass of water with two soluble aspirins dissolved in it. In about two minutes the fish started to show signs of lack of control. It started to roll about in the water and slowly seemed to fall asleep. After 10 minutes the guppy seemed to realise that the

water was the cause of its predicament and made a few half-hearted attempts to jump out; however, five minutes after that it went to sleep permanently.

"The second method was to use nicotine from the filters of used cigarettes. I had previously heard that nicotine is one of the deadliest poisons in its group and the only reason that smokers do not die immediately from it is presumably because they absorb only small quantities. Anyway, the filters were removed from the cigarettes and mashed up in a jar of water. When the water was light yellow, but still clear, another guppy was placed in the jar. Immediately it seemed to become paralysed. After 5 minutes it was beyond caring, and in 10 minutes it was dead. The point of this experiment is: if a few 'fag' ends can kill a fish, think what a cigarette smoker's

nicotine-stained hands—or a piece of cigarette ash—could do to a community fish tank!"

I should like to remind readers that I do not necessarily agree with, nor do I accept any responsibility for, the views expressed by contributors to this feature. As a point of interest, I should be pleased to hear of the success or failure of the pieces of Java moss some readers obtained from me. Do your conditions suit it as well as mine? At the moment, in my leaking tank, the moss is growing strongly on items such as the heater and thermostat cable, the rocks, the glass, the filter tubes and the underside of the top frame; indeed, growths of the plant have emerged from the top of the tank and are growing on the outside top edge of the frame. Obviously these growths, and some on the cover glass, obtain their moisture normally and by capillary attraction, as well as from condensed water vapour. Although this species can get out of control, it can be kept within bounds if a handful is removed now and again.

14 years old Neil Garbutt lives at 379 Main Road, Bilton, Hull, North Humberside. He writes: "... My father and I have recently finished building a fish house in the garden. I think it might be useful to readers if I explained its basic construction, so I shall endeavour to explain. The walling is constructed of 11 in. cavity brick on a 14 in. brick foundation, and has a sturdy concrete base. The fish house is 14 ft. x 9 ft. The roof was easily constructed from strong, corrugated plastic sheeting which was obtained from a local D.I.Y. store. It was then bolted down over two strong, wooden beams running from one end of the roof to the other. The plastic sheeting is transparent so as to admit light from the top.

Now, along the back wall of the interior of the fish house runs a long, angle iron, welded stand on which

the help of a local electrician. I have not yet put the fish-house into full operation for the breeding of goldfish but I hope to commence operations in the school holidays in July. The total cost of the entire fish-house was £30, and in winter it will be heated by a greenhouse heater. I hope readers will benefit from my experiences and, possibly, use some of my ideas in their design."

Photograph 2 shows a plump *Corydoras* species. Please send me details of your experiences with the breeding of catfish.

Mr. D. E. Battle, of 47 Cobden Street, Darlington, Co. Durham, writes: "I'd like to take advantage of your kind offer of a 'starter' of Java moss. I seem to have trouble growing most plants—it seems to be something to do with water. It did just occur to me



are my tanks. Drainage channels, built of plastic guttering, run all around the interior so as to remove waste water via drainage holes located in the corners of the walling. In one corner of the fish house stands a sink; I find it useful for washing gravel, for plants, and for the temporary storage of *Daphnia*. Also, in this corner, on a shelf, I keep my wooden boxes containing my cultures of white worms, meal-worms and micro worms which I find ideal for young goldfish—which I have already reared. In another area of the room I keep small, 20 in. x 12 in. x 12 in. aquariums and 20 in. x 10 in. x 4 in. hatching trays. I use these for rearing goldfish. The whole fish-house is completely draught-proof and is illuminated by a long, fluorescent tube which runs centrally down the roof. Soon I am going to construct a panel from which I can control the filtration and aeration of my tanks. My house is not properly fitted out with an electrical system yet, but I hope to do this soon with

that it might be something to do with fluoride being added to water supplies. It might be interesting to see what your readers think of this idea as trouble in growing plants seems so widespread. I enclose a couple of stamps and hope I am lucky." (I hope your 'starter' is now growing well, Mr. Battle. I should think that fluoride has nothing whatsoever to do with your inability to grow plants. After all, most water supplies have chlorine added and this has little or no effect on aquatic plant growth. Chlorine and fluorine belong to the same chemical family; and many natural waters contain these elements, in the form of compounds (salts). Sodium chloride, i.e. NaCl or common salt, is, as its name suggests, common in many waters. Plants should thrive if they obtain required amounts of heat, light, nutrients, oxygen and carbon dioxide—as well as water. Check that none of these is in short supply, e.g. try increasing the light reaching your aquatic plants, or try adding some liquid

plant fertilizer—specially compounded for use in aquaria—to your tank. Some firms also supply growing media for use under aquarium gravel. I seem to be very lucky with aquarium plants. As a friend said recently, after I'd bought a few new fish, "There's little point in your buying new fish; they won't be seen for all those plants!" I must admit that five of my six tanks look like underwater jungles in which only the occasional fish can be seen. Photograph 3 shows one of my tanks a couple of weeks after it was set up and planted. I must admit that few fish can be seen now amongst the forest of plants—but they all come out at feeding times.

From 64 Chelsea Green, Linslade, Leighton Buzzard, Beds., comes the following letter, written by Mr. R. J. Fountain. "I was glad to read your request

tanks." (It is possible that the peat lowered the pH of the water, i.e. rendered it slightly acidic, and killed off the bacteria that may have caused the cloudy water.)

Mrs. Pauline Hodgkinson's home is at 291 Plodder Lane, Farnworth, Bolton, Lancs. She writes about keeping coldwater fish at tropical temperatures. "Many people seem to be under the impression that some varieties of fancy goldfish are too delicate to stand coldwater temperatures and must be kept at tropical temperatures. May I point out to your readers what the learned gentleman, Dr. Yoshiichi Matsui, Professor of Fish Culture at Kinki University of Japan, has to say on this particular subject. "Tropical conditions are not natural to goldfish and those raised under them seldom develop any vivid



for readers' views on the use of peat fibres in aquarium filters. About six months ago I had just set up a 39 in. × 12 in. × 15 in. tank, stocked with fish, when to my dismay—and for no apparent reason—the tank clouded up and I started losing several fish daily. I tried changing the water in stages but it still remained cloudy. After several weeks of the tank in this state, and the fish stock dwindling, my brother-in-law suggested I purchase some peat fibres. I did so—and within two days the tank was clear. Since then I have used peat fibres in all my corner filters and the tanks remain clear. The only drawback I have discovered is that the water tends to colour and needs partial changing regularly. I have also found peat fibres, in the filter, condition the water for the successful spawning of some fish, e.g. tetras and barbs. My local shopkeeper tells me that very few people seem to have heard of using peat fibres; so perhaps this letter will help fellow aquarists who have suffered from cloudy

colours and are generally quite delicate, with a reduced resistance to disease. A further drawback is that goldfish raised under a constant high temperature are very often found to be sterile." I hope that this will be of interest to your readers." Mrs. Hodgkinson is Public Relations Officer of the Northern Goldfish and Pondkeepers' Society.

I was pleased to receive the following letter from one of our American readers—Mr. Richard Townsend, of 59 Ironwood Dr., Vernon, Conn. 06066, U.S.A. He writes: "Please forgive me for waiting so long before answering your inquiry in the October 1976 issue concerning *Ceratopteris thalictroides* (water sprite/Indian fern). Perhaps I should give a complete summary concerning my aquarium because water sprite, as we call it, grows very abundantly in my tanks. I bought one plant a year or so ago to place in a bare spot in my 20 gallon, 30 in. × 12 in. × 12 in. tank, to see how it would look. As it looked nice,

I thought of buying more; but not until I observed its rate of growth, etc. It was a short time later that I noticed one stem darken as if dying; but it had tiny new leaves with short, almost invisible roots. I left the plant to itself and these tiny leaves broke off and floated to the top of my tank where they continued to grow. When they were large enough I planted some in other spots in the same tank and, with others, I furnished my other tanks. Also, when left to themselves, these many, tiny, new plants, if left as floaters, will cover almost the whole top of the tank. With overhead fluorescent lighting they make the tank less bright, but no less beautiful, with shadows here and there for my catfish to rest in.

"The specifics for my tank which grows the water sprite very well are: Fish—1 angelfish, 1 *Plecostomus* type catfish, 2 *Corydoras*, 1 *Pimelodella* catfish, 2 neons, 2 *Barbus tetrazona*, 8 red wagtail swordtails and their mother, and 10 mollies and their parents. I understand that my combination of fish is supposedly not the best, although I have not had any disease or parasites; and all are in excellent health and for the most part leave each other alone—except for the male livebearers chasing the females in order to mate. Water—My water is very soft, being softened by a commercial water softener; and it is also de-ionized (*sic*). The temperature is 72°F, and is kept there by a thermostatic heater. The pH is 7.0-7.2. Appliances—I have an undergravel filter as well as the outside power filter in which I use filter floss and bone charcoal. The gravel is 2-3 in. deep. There are two fairly large rocks and a coconut shell split in half to provide caves for some of the catfish to hide in during the daylight hours. Other plants—*Elodea densa* and one sword plant. Lighting—1 × 20 watt fluorescent strip reflector on for 14 hours daily. Water change—Approximately 3 gallons per week. Food—Only for the fish.

"... Now I have a question for you—or you may direct it to Mr. A. Boarder. I have read lately that many people in England and on the continent keep our coldwater fish, the sunfish or pumpkinseed—*Lepomis gibbosus*. As we have many of these fish in the water around here, I asked our eldest boy to get me a few so that I could discover for myself why this fish should rate as an aquarium fish in demand. He did; and they are now settled quite nicely in an aquarium of their own until I know more about them. I hope you can help me here. Where could I find out more about them as very few people here keep coldwater fish, although the *Lepomis gibbosus* is a pretty fish indeed?" (Perhaps Mr. Boarder will be kind enough to answer the query about the pumpkinseed sunfish—if he happens to read this. I note that Sterba's tome contains a short section dealing with the species in question.)

Siez Nous, Le Clos Vert, Victoria Village, Trinity, Jersey, C.I., heads a letter I received from Mr. T. D.

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Wynn who writes: "May I start by congratulating you on a most interesting and informative feature. I noted in your last edition that you requested readers' opinions of their local dealers and I felt that you would be interested in the state of affairs in Jersey. We have two shops on the island. One is a rather small, one-man business which has some 25-30 freshwater tanks, and 4 marine; it offers a friendly service. It is possible to obtain a surprisingly wide variety of fish... The other shop has about 40 freshwater tanks and 6 marine. These are always in immaculate condition and to see any fish looking unhappy or diseased is extremely rare. Friendly advice is always available and I have always found it to be sound. A general criticism of both shops is that the variety of plants available is very limited. To summarise: I would say that both shops are well worth a visit each week and offer a good service... We suffer a little in Jersey by having to pay freight charges, across the Channel, which on a £15.00 stand cost about £5.00; however, we are still able to obtain our *Aquarist* for 30p, so we can't complain too much. One thing I would like to see more of is product reviews since it is difficult to know the quality of a product until you have used it."

I'll conclude this month's feature with another letter from Mrs. Sue Whittenham, of Portsmouth, as its contents may be useful to those holidaying in Cornwall. She writes: "Whilst on holiday recently my husband and I visited an excellent public aquarium in East Looe, Cornwall. Any readers of *The Aquarist* holidaying in that area are strongly urged to visit this aquarium as it is definitely the best-kept one I have ever visited. It is hidden away in one of the side streets of Looe—Lower Street, if I remember correctly; and although there are signposts directing the public to the aquarium, we had to look twice to make sure it was the correct door. The admission charges were 10p for adults and 5p for children under fourteen. My husband, a non-aquarist, was most impressed by what he saw. All the tanks were clean and attractively furnished, and the fish looked healthy. Proof of this is in the fact that a pair of angel fish had laid a batch of eggs, that they were fanning, and that the jewel cichlids had hatched a batch of fry. There was also a collection of foreign birds on display, one pair of which had laid eggs too. Although the aquarium was also one of the smallest I have visited, it was well worth a visit. Incidentally, there was also a notice to the effect that the proprietors would be prepared to obtain, for an individual, any fish or bird required, although I must admit I haven't put this to the test."

I've a lot of letters left unused this month, but I'm always pleased to receive fresh opinions from old or new correspondents. One point: please do

Continued on page 187

THE AQUARIST



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

Does *Barbus nigrofasciatus* make a good community tank species?

B. nigrofasciatus is peaceable, active, and does not chew the plants to shreds. It swims at all levels in the water and accepts any food taken by non-finical omnivorous fishes. Yet it has one failing that is not shared by several other small barbs. It can look quite drab when it is not stimulated by the reproductive urge, a change of water or some other environmental factor such as an increase in temperature accompanied by some direct sunlight.



Barbus nigrofasciatus

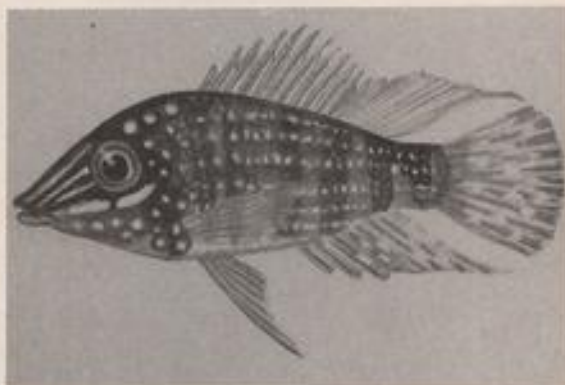
I am particularly interested in keeping gouramies and cichlids together in a well-planted 36 in. x 15 in. x 12 in. tank. Please can you give me the names of a few suitable species?

Trichogaster leeri, *T. microlepis*, *Colisa fasciatus*, *C. labiosa* and, of cichlids, *Aequidens maronii*, *A. curviceps*, *Geophagus jurupari* and angel fish (*Pterophyllum*) in their several colour varieties.

Does the Malayan half-beak live all right in a community tank?

Right away the answer is no. First, this top-swimming fish requires very shallow water of a brackish nature. Secondly, the mature male of the species is very pugnacious and fights hard and often with members of its own sex. Thirdly, *Dermogenys pusillus*

by Jack Hems



Geophagus jurupari

—to give the species its formal name—does not settle down at all well if other fishes of a boisterous or curious nature are present. In short, the Malayan half-beak requires a specialised environment and live food such as wingless fruit flies, gnat larvae, aphids or a steady supply of swallowable fish fry.

What foods out of a garden can be fed to oscars?

Provided the ground or vegetation itself has not been drenched with pesticides and similar toxic substances wood-lice, small snails, earthworms, beetles, and small black or grey slugs make acceptable live food for oscars.

What plants are ideally suited to a discus aquarium?

If the tank is not too brightly illuminated and the water is well-filtered, soft and acid (as it should be for discus), then go in for species of *Cryptocoryne*, particularly *C. affinis*, *C. wendtii*, *C. beckettii*, and *C. willisii*. *Microsorium pteropus* fern and *Vesicularia*

dubiana moss should flourish well if tied to some bog wood or non-calcareous stone.

Is it true that the Japanese medaka will live quite contentedly at room temperature?

The Japanese medaka or rice fish has a wide range of temperature: from the fifties to the eighties (°F). The change from a dealer's aquarium temperature to comfortable room temperature should be brought about very gradually, that is over the space of a day or two. Although the fish remains active and feeds all right at a temperature in the sixties (°F) breeding does not take place unless the temperature is raised, and is maintained, in the middle to upper seventies (°F).

Is the red-finned shark (*Labeo frenatus*) a long-lived and satisfactory community fish?

L. frenatus has a life-span of upwards of five years. It does no harm in a community tank provided it is kept with non-timid fishes of sturdy build or fishes alert enough to avoid its sudden rushes. Then again, one red-finned shark in a tank is better than two. Two will quarrel every time they meet. The less dominant of the two will soon be kept from food and die of slow starvation and too frequent knocking about.

I have just set up my first tank (24 in. x 15 in. x 12 in.) and I would like to know how often the water should be changed and the tank cleared out completely? Furthermore, how many hours of electric illumination should be given daily?

If the tank is well planted with species of *Cryptocoryne*, *Vallisneria*, *Sagittaria*, and the like, and is not overstocked with fish, then all you need do is to siphon away excessive sediment from the bottom every month and top up with clean rain water mixed with a little mains water or mains water boiled first to reduce its customary hardness (except in some favoured parts of the country). Mark you, all fresh water introduced into the aquarium to make good losses brought about by cleaning or evaporation must be heated to the same temperature as the aquarium. Provided the fishes are not overfed and siphoning is carried out periodically, then it could be several years before a thorough cleaning out becomes necessary. Your tank will require about 14 hours light a day. Use a 20-watt fluorescent lamp placed not more than 6 in. from the surface of the water.

What is a chocolate catfish?

A well-known American reference work describes this fish under the scientific name of *Acanthodoras U.*. The photographic illustration of this fish depicts a typical *Acanthodoras* species, with some creamy or beige white markings on the fins and along the middle of the sides. The fish is said to be native to the middle Amazon. Perhaps if you cared to get in

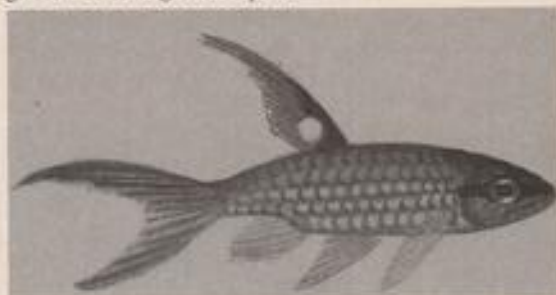
touch with the Catfish Association of Great Britain it would be to your advantage.

I am a beginner in tropical fishkeeping and would like to be given the common names of some small fishes that do not hide away among plants and live at peace with one another.

Seek any of the following species at well-established dealers' shops: Schubert's barb, checker barb, cherry barb, ticto barb, neon tetra, black neon tetra, pristella, platies, harlequin fish, scissortail rasbora.

Is Arnold's characin easy to keep and breed?

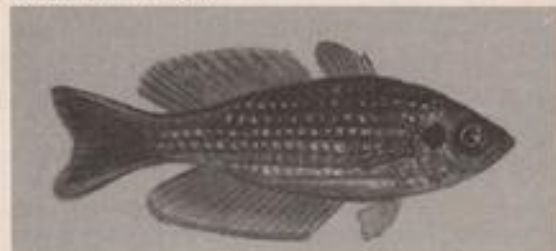
This interesting fish known to science until quite recently as *Copeina arnoldi* (now it is called *Copella arnoldi*) feeds on most dried and live foods readily and is quite comfortable at a temperature in the seventies (°F). Breeding is not difficult. The spawning habits, however, are very different from those of the general run of oviparous fishes and are too involved to go into here. I suggest you look this fish up in any comprehensive book on tropicals. Always keep its tank well covered with a snug-fitting hood or sheet of glass. It is a great leaper.



Copella arnoldi

Please give me some tips on the general requirements of the dwarf Australian rainbow fish.

This Australian rainbow fish described in the books as *Melanotaenia maccullochi* flourishes best in non-acid water, slightly salty, maintained at a temperature of about 75°F (24°C).



Australian Rainbow Fish

Continued on page 201

THE AQUARIST

GOLDWATER QUERIES

by Arthur Boarder

Please could you give me information on Rainbow Trout and Mirror carp?

I am not sure which type of information you require. I presume that it is the keeping of them which interests you chiefly. The Rainbow Trout prefers a fairly fast flowing river which has a gravelly bottom and clear well oxygenated water. However, it can be kept in a fair sized pond which has good clear water. In a tank there must be filtration and constant aeration to provide the right conditions for this grand fish. The natural food consists of all forms of small water life but in captivity the flake foods will be taken and Trout pellets can also be given, apart from the usual live foods such as garden worms and maggots. The Mirror carp is similar to the ordinary carp except that it has large shiny scales on its side. It is not a particularly good type of fish for the pond as it is inclined to stay well below the surface and as it is rather dark in colour, does not show up very well.

Can you tell me the average age of the following fishes for breeding: Green tench, Golden orfe and Rudd?

I do not think that the breeding times for the fishes depends on their age as much as their rate of growth. When plenty of food is available and the fish have plenty of swimming space, they can grow at quite a fast rate, especially in a warm summer. As for the Green tench, I can give a definite answer to your query as I have bred them on many occasions in my garden pond. In 1949 I bred from young tench when they were only two years old. However, this may not be proof that they would do so in the wild. The fish in question had had special treatment and feeding as I wanted to enter them in a Society Breeders Class that winter. Whether these fish would have grown as fast in the wild without the special feeding is problematical. I think it quite probable that the Green tench would breed at three years of age.

As for the Golden Orfe, again the same applies as regards the rate of growth. Usually these fish do not breed until they are of a fair size, but I have seen them spawning when only seven inches long over-all. A very clear and well oxygenated water is essential if one wishes to breed these very handsome fish. As for the Rudd, I think that a well grown fish of three years of age would spawn. I have seen these fish spawning in a reservoir and among the chasing fish have been some which were no more than five inches long. Whether they were young males or not I am not sure but they were vigorously chasing and not just there for a feed on the eggs. A few years ago Mr. H.

Tisbury, of Romford, told me that when his Rudd spawned in his special Rudd pond, their actions were very vigorous and he saw hundreds of eggs above the water-line on grasses and other plants.

Is there a species of fish known as the Silver Orfe, and if so are they very rare?

The Silver Orfe, (*Idus idus*) L. is certainly a true species. It is found in rivers and lakes in various parts of Europe. The Golden orfe is the same species but the golden variety appears to develop in most of the young silver orfe which are bred in certain parts of Bavaria. It is not a rare fish but may not be seen in many dealers' lists as it is not as attractive as the golden variety and so there is little call for it.

I am thinking of sinking a steel bath in the garden to make a fishpond. What plants shall I use, how many shubunkins will it hold and will the fish be safe in the winter?

The bath may be used but it must be realised that in your area the water could freeze up very thickly in severe weather. You might have to take the fish inside or supply a small tank heater of, say, 100 watts, to keep a small hole in the ice open when frosts occur. Just two oxygenating plants need to be used, *Lagarsiphon major* and *Ceratophyllum demersum*. You could add a very small type of water lily, such as one of the species of *Nymphaeae pygmaea*. Six four-inch Shubunkins will be enough for your pool.

I have a tank with fantails, orandas and small goldfish in it together with some water snails, *Limnaea stagnalis*. The other day I noticed one of the fantails swimming round with an adult snail, minus its shell, hanging from its mouth. Is this unusual and is there any reason why the fish should act in this way?

It is certainly unusual for a small fantail to be able to suck an adult water snail from its shell and I would suspect that the snail was either dead or dying before it could have been removed from its shell. I have known green tench to suck water snails from their shells and many fishes will eat snails soon after they are hatched. I doubt if the small fantail would be able to swallow the snail and it will be interesting to see if the same fish can repeat its action. In any case water snails are of no useful value in a tank and many aquarists would like to get rid of those which they have introduced. A strain of your type of fantail would be very welcome to aquarists who have the water snail problem.

I have just started to keep coldwater fishes and would like to know which plants to put in the tank. Is it true that some tropical plants will also grow in a cold tank?

Some tropical plants will grow in a coldwater tank if it is kept in a living room where the temperature may not fall much below 60° F. This is especially the case when an overhead filament lamp is kept on for twelve or so hours a day. This lamp warms the water somewhat. However, there is no need to use more than three species of plant in your tank. I suggest that you use *Vallisneria spiralis*, *Egeria densa*, *Lagarosiphon major* and *Ceratophyllum demersum*. For a tank the size of yours I would prefer to use the *Lagarosiphon major* to the *Egeria densa*, as it is rather stronger in growth.

I have made a pond with a liner and would like to add a waterfall. The plastic ones I have seen do not appeal to me. If I make one with concrete will it have to be seasoned like a concrete pond?

There could be danger from free lime from a concrete fall. However, you can make one with slabs of rock or concrete and then cover all with a strong polythene liner. Arrange this so that it forms a channel to prevent any leakage of water from the sides. This should be fairly easy to construct and would not need weathering at all.

I wish to breed scaled fantail goldfish but although I have several fancy goldfish breeders in my Society, none have any scaled specimens to sell me. Are these fish still available and if so from where?

Scaled fantails are still available and I will include an address from where they may be obtained. The man I am recommending had some from me in 1947, and has bred and kept many thousands since then. This variety is especially useful for breeders who have a pond at their disposal as they winter well out of doors.

I have a pond in the garden made from an old cast iron bath. I have three Rudd in it and would like to know if I could add some goldfish and which plants are best?

This is a very small pool and could be dangerous

for fishes during a severe winter. You could add two or three small goldfish and Hornwort, *Ceratophyllum demersum* is a very good plant for your purpose.

Can you advise me on my pond problem? It is 6 ft. x 3 ft., and is of concrete construction. It has sprung a leak but had been all right for fifteen years. Is there anything I can paint the cement with to seal it?

There is more than one remedy for your pool. You can line it with a Butyl liner or paint it over with one of the sealants on the market. It is rather too small to be floated over with a fresh coating of concrete, as it would further reduce the capacity of your small pool. You could use Pondseal which is a type of rubberised paint. The pond would have to be emptied and dried completely. Then it could have a coat of primer and a couple of coats of the sealant. Each coat must be allowed to dry out before the next is added.

What do you consider to be the correct rate for stocking a garden pond with fishes? I have seen it stated that 24 square inches of surface area for each inch of body length of fish.

The rule given is for a tank and this I agree is all right. However, a good aquarist could exceed this a little with safety; whereas a beginner might not succeed with this rate. As for using this rule for a pond, I disagree most strongly. I will give, as an example, a pond of 10 feet by 6 feet by 2 feet. This I consider to be a good size for the average garden. Using the above rule for stocking, this pond would hold 360 inches of body length of fish, or 90 fish of four-inch body length. This is absolutely ridiculous. My rate of stocking for this pond would be 12 fish of four-inch B.L., or 10 fish of five-inch B.L., or 8 fish of 6-inch B.L. This ratio will give a good stocking which will allow the fish to grow and to remain in good condition providing normal treatment is given to the pond. I must stress that this is my own opinion derived from years of pond-keeping and is not in any way taken from books. I like, whenever possible, to write as far as my experience has taught me and not to rely on book information. Fishes in an under-stocked pond will have space to grow and will probably breed as well. Most fishes in a pond can grow half as large again in two years.

WHAT IS YOUR OPINION? continued from page 182

PRINT your name and address carefully. I'm an expert at reading bad writing—but even I have my limits; so keep at least those important facts clear. Please send me your opinions on any of the above—and on the following: 1. Sending fish from one part of the country to another; 2. dangerous aquarium fishes;

3. controlling algae in ponds; 4. treating rusty angle iron tank frames; 5. uncommon livebearers; 6. sources of good quality, healthy, coldwater fish; 7. breeding reptiles; 8. the most attractive aquarium you see while on holiday; 9. feeding aquarium plants; and 10. culturing live foods.

KOI QUERIES

by Hilda Allen

I have a pond 9 ft. x 6 ft. x 20 in. Is it a practical proposition to add a filter system? If so, can you recommend a suitable make, a portable one would be preferred, in order to use on indoor tanks that I hope to install later.

Filtering pond water is quite a different proposition to filtering aquaria and I do not know of any portable filter made to meet both your requirements. According to the size of tanks, the fish and stocking rates, most tanks can be adequately filtered by any of a variety of under-gravel, outside or power filters that are widely advertised.

Your pond is on the small side and not deep enough to install an internal under-gravel filtration system, but perhaps one could be built alongside your pond? They are cheap and easy to construct and give excellent results. There are innumerable ways of filtering ponds, most methods use gravel and can range from a water cistern, bath or water-butt containing gravel, to highly sophisticated filtration systems incorporating settling chambers and varying sizes of gravel in separate compartments.

Filtration is an enormous subject to deal with in one brief letter but some form of water filtration is advisable. Filtered water provides a more healthy environment for Koi that are usually confined to relatively small garden ponds, although lakes might be more suitable. Providing what may be called "healthy" water is far more important than food because, like ourselves, fish can survive for long periods without food, but only for a short time without oxygen. The difference in the health and growth rate between Koi kept in clean conditions and those that exist in murky, stagnant ponds is tremendous. Healthy Koi eat a great deal of food all of which helps to pollute the water of course, so if your pond-size is restricted you should limit the number of Koi you hope to keep.

During the recent hot sunny weather it appears to me that the colours, especially the reds, have faded on my Koi. Is this possible, if so, is the loss of colour permanent?

It is usually the red on Koi that fades a little during hot weather but other colours also may appear less bright in summer, especially if the water is reasonably clear.

The colours are at their best during the colder weather when the Koi are less active and eating less and the body flesh is firmer. The fading at high water temperatures is not usually permanent but it has been known. Red is a difficult colour to establish and

maintain and I have a Koi myself that was originally *Kohaku* (red and white Koi), it is now an all-white Koi (*Shito-Muji*). As other *Kohaku* (in the same pond), remain red and white after several years I can only speculate on the reasons why one should lose all red pigmentation.

My pond is 12 ft. x 7 ft. x 18 in. deep and contains six small Koi. I have just built an external, gravity gravel filter 5 ft. x 18 in. x 12 in. deep. Today I operated the filter for the first time and realise that some time must elapse before I can determine its effectiveness, but I was disappointed when I compared the water from the filter with some from the pond. Will the filter remove algae from the pond when it has had time?

There are several unknown factors but it is almost certain that the filter will have some effect in clearing your pond water. I assume that the water is fed into the top of the gravel and allowed to run out from the bottom. Filtration, which will be purely mechanical filtration at first, will be assisted if a spray-bar can be fitted to the water inlet so that the water is sprayed over all the area of gravel instead of just running straight through. A spray-bar is easily made from a length of plastic pipe drilled with holes and plugged at one end, or the water can be fed into a centre tee-piece with two spray-bars. Any outside filters will collect an amount of algae and other matter and ideally a settling space should be arranged, from which any excessive build-up of waste can be drained away from time to time. The area of your filter is quite small in relation to the size of pond and, dependent upon the output of your water pump, the flow rate may be too great for the filter and practically no settling/filtering action is taking place. However, after about 2-4 weeks of continuous running some bacteria should be flourishing in the gravel and the resultant biological action will materially improve filtration.

I made an under-gravel filter in my pond with a 12 inches layer of fine pea gravel which operated quite successfully for a few weeks. Then the water became very green and I could see bubbles rising from the gravel bed. Can you explain what has gone wrong as the pump was kept running continuously.

From your statement that bubbles were seen rising from the filter it would appear that some blockage has occurred and methane gas is being produced by decaying matter. Probably a 12 inches depth of fine

gravel is too great for a large filter area and the flow of water through your pump. I would suggest that you reduce the depth of fine gravel and thoroughly flush through the remainder to make sure this is clean and free of any obstruction. During this operation the water pumped through the filter should be run to waste and not returned to the pond. 12 inches or more of gravel can be used for both undergravel and external filtration but the size of filter area and pump output must be considered and in some cases it is more advisable to use larger, $\frac{1}{2}$ in. to 1 in. screened gravel.

My Koi spawned in late May and I have managed to keep more than ninety youngsters which are now about one inch long. Many are showing colour and I would like to keep them all but I do not know if they can be wintered outside. Space would be a problem indoors but I would like to have your opinion.

In general I believe that infant Koi are best overwintered indoors for their first winter. This may be the only means of ensuring that they are able to feed right through the winter months. Food is all-important then as they have no reserves to draw upon like the larger Koi and they will show the effects of being deprived of food at this critical stage in their development. Keeping even small Koi undercover involves some expense and certainly some work in keeping their conditions healthy but it usually proves to be worthwhile. Baby Koi showing any deformities such as misshapen fins, gill-covers, spines or mouths are easy to spot and these should be disposed of at the earliest opportunity. Colours are unpredictable as

these can change, fade, or improve up to at least two years of age.

Making a temporary pond of wood and polythene sheeting in a garage, conservatory, greenhouse or even shed is a cheap way of rearing Koi, providing that heat and light are available. Any temporary container should be made as large as possible, not only to provide plenty of growing space but also remembering that the Koi will need protection until early May at least. At water temperatures of between 60°F and 70°F it is fairly easy to grow baby Koi up to four, five or even six-inch fish within a year. If your pond is really deep (4 ft. to 5 ft.) and in a sheltered position then some of the baby Koi should survive the winter in there, but baby Koi in shallow water during frosty weather are miserable and many develop swim-bladder trouble.

Anyone interested in seeing the progress Koi-keeping has made in the U.K. would be well advised to visit The British Koi-Keepers' Society's National Koi Show, KOI '77, to be held at the Botanical Gardens, Edgbaston, Birmingham on Sunday, September 4th.

This show, which promises to be the largest Koi show held in this country to date, is sure to attract a lot of entries and it is anticipated that many Koi, ranging from home-bred youngsters to large specimen fish in most of the recognized varieties will be on display.

Prominent members of the Japanese Koi-Keeping Society have agreed to judge and the show will be open to the general public from lunchtime onwards, after judging has been completed.

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DESIGNING A FISH HOUSE

HINTS ON HOW TO AVOID POSSIBLE PROBLEMS

by Pete Watson

ARE YOU capable of laying a few bricks, sawing wood straight, or making your own all-glass tanks? Should the answer be 'no,' then perhaps you had better reconsider starting your own fish house. For one of the basic requirements, both in the initial setting-up and the subsequent running, is an inherent do-it-yourself ability. Without that ability one is forced to rely heavily on others, and possibly even more heavily on one's wallet. If you are all fingers, thumbs and fumble when it comes to hammers, nails and adhesives, then I am afraid that you will find little solace in the following article. It is not my intention to tell you how to construct a fish house, I aim only to give the prospective fish house keeper a helpful insight into some of the problems that he may encounter, and suggest ways in which they might be overcome.

As always, before diving in at the deep end one must plan, and the plans must not only cover the size and design of the fish house, they must also take into consideration the cost. Not just the initial outlay, but also the subsequent running costs. Quite obviously both must be kept within the limits of the wallet, regardless of whether the fish house is intended to be self-supporting or not. Many a hobbyist has spent time, money and energy building up a fish house, only to have to pack it in after a while because the running costs were found to be too high. I do not intend to discuss costs in this article, they are the subject of a separate article, but I do contend that some of those unfortunate hobbyists would still be enjoying their fish today had they given their basic fish house design just a little more thought.

Through natural enthusiasm one is often tempted to rush straight to the heart of a project and skimp on

the preliminary organisation and planning. This is not wise; no one short of a genius can work without some sort of a plan. However, before even sketching out a plan visit as many fellow hobbyists' fish houses as you can and note what you see, even the badly organised fish house will show you what to avoid. If possible organise yourself a visit to a professional fish hatchery, or a wholesaler, and observe the way they do things. You will not be popular if you take up their time asking lots of questions, to them time is money, but much can be learnt from just looking, and asking the odd question. Although these establishments will undoubtedly be working on a much larger scale than you intend, basic ideas can be gleaned and modified to suit your own particular requirements.

There would appear to be three basic ways in which a fish house can be created:

- (i) Converting part, or all of an existing room, shed, garage, etc.
- (ii) Fitting out a suitable (garden) shed as a fish house.
- (iii) Designing and building a fish house from scratch.

There is, of course, a certain degree of overlap on all three methods and criteria that applies to one will often apply to all three, but ultimately the decision as to which method will be adopted will depend a great deal on (a) where you live and how much garden space you have, and (b) how big you want to be and how much time you will be able to afford the fish house. Not just time spent in the construction stage, for that is but a short-term consideration, but time that will be required to be spent on day-to-day running of the fish house. For instance, a reasonably organised, 50-tank

fish house, used mainly for breeding and rearing fish, would require you to spend between one and two hours every day on feeding and general running tasks, backed-up by as much as double that time at weekends with cleaning and general maintenance tasks.

Given an approving spouse, or parent, the initial choice for a fish house would probably be an unused room in the house. If one has little or no garden space, then this is perhaps the only choice. However, it is often not an ideal choice, and the following questions should be argued out to the satisfaction of all concerned before going ahead.

- (v) Will the running noises of the fish house affect the rest of the family? (Bubbling filters and aerators make quite a noise in the quiet early hours.)

If it has to be a room inside the house, then where is the most suitable place? Any upstairs room, rooms with wooden floors are not really suitable because of the potential weight load on the floor, and over a longer term the floorboards and joists will be in serious danger of rotting due to the damp and humid conditions. Such rooms are also unsuitable because from a fish room point of view, little can be done to improve

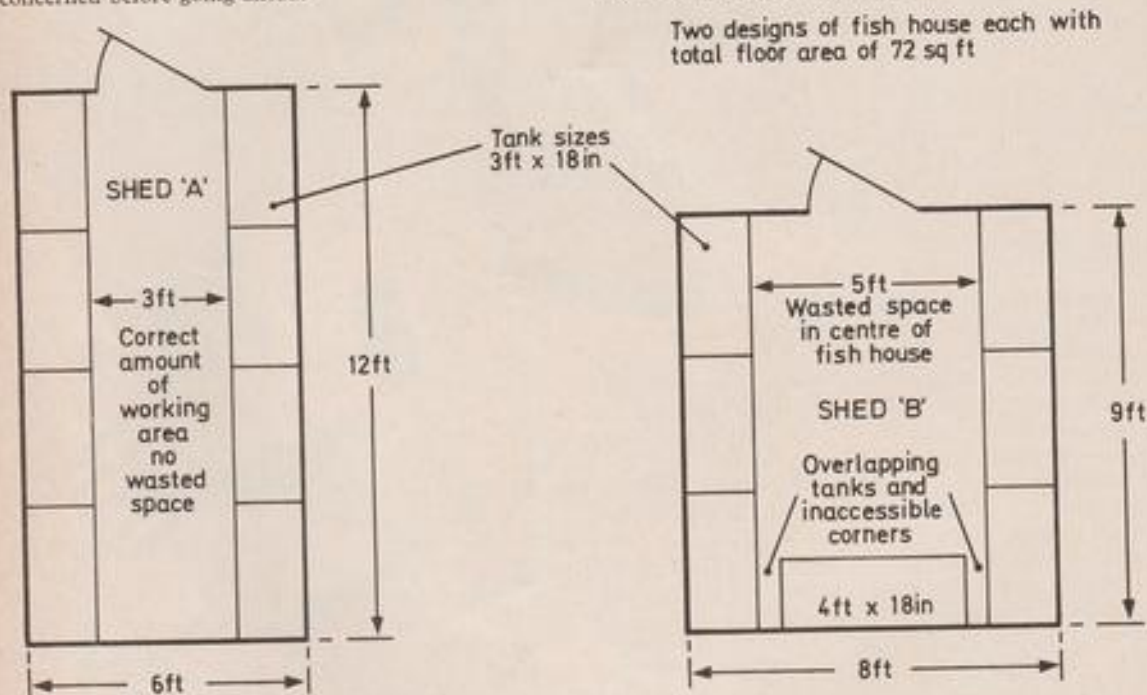


Figure 1 FISH HOUSE SIZES

- (i) Will the existing floor support the weight of the tanks and water?
- (ii) Does it matter if the room and its fittings are damaged (possibly ruined) by condensation and damp?
- WARNING** Never under-estimate the amount of condensation and dampness in a fish house, and the structural damage it can cause.
- (iii) How close is the room to amenities such as drains, water supply, and adequate electrical supplies?
- (iv) When friends and fellow hobbyists visit your fish room will they have to trek through the rest of the house? Will their presence disturb the rest of the family?

them, especially if at some time in the future they will be required to be returned to their originally intended use.

A basement, or cellar, is often used only to store the family junk, and provided that alternative storage can be found for the junk, these are rooms that can be reasonably easily commandeered and converted into fish rooms. For reasons I shall come to in a moment basements do not make ideal fish rooms, but they are preferable to any room previously mentioned, and I have seen one or two basements that have been converted into very workable fish rooms. And with respect to those hobbyists with basement fish rooms I recognise that because of the lack of alternatives they have realised the shortcomings of such a room but nevertheless have gone ahead and made the best fish

room they could under the circumstances.

The shortcomings of a basement are not difficult to see. Lack of natural daylight means that electric lights have to be burned most of the time and although relatively stable, the temperature in a basement is usually a few degrees cooler than in rooms above ground. Thus more heat will be required to maintain water at tropical temperatures which will add considerably to the running cost. From the amenities point of view, a water supply is sometimes already present, but if not it can be plumbed in without too much trouble, but waste water poses a problem. This has either to be carried up to the drains, or a suitable pumping arrangement must be installed to pump the water up to the drains. Access is also sometimes a problem. Some basements have access stairs on which I would not care to carry a couple of buckets of water, never mind a 3ft. tank.

A room that I have no personal experience of, but have seen put to good use by town dwelling hobbyists, is the conservatory. It seems to have more to offer than a basement and is usually situated near the kitchen making it convenient for services such as water supply and drains. Natural light should also be available in abundance, and on the particularly sunny days of the year there would probably be too much, necessitating some form of shading to be organised. The small nuisance of shading in the comparatively few sunny days of the year is almost a luxury, since the readily available source of natural light will help the pocket in the not so sunny days of spring, autumn and winter. Remember the alternative to natural light and heat is the purchase of energy from the Electricity Board.

The cooler months of the year will prove to be the testing time for a conservatory fish room, and the extent to which a conservatory can be insulated against heat loss will have a large influence on the running costs. Space heating is usually the most economical way to heat a reasonably large fish house, but space heating a conservatory may prove rather expensive, especially if the conservatory is one of the main entry/exit routes to the house. One must consider the number of times the conservatory door is likely to be opened and closed during the day, if not by oneself then by the rest of the family and tradesmen. For this reason I would recommend individual tank heating in conservatory fish rooms, unless of course a way can be found to separate off the fish house part of the conservatory from the rest.

Since most rooms that are in, or attached to, the house have now been considered for fish house use, we can move on to the independently situated fish houses. These comprise (garden) sheds, garages, glass houses, etc, which can be either partly, or completely taken over for fish house conversion. Since most of the detail will apply to all constructions, I intend discussing in detail only the basic design requirements of

the (garden) shed type fish house, and then later, mention a few design considerations for the custom built type fish house.

In a previous article I mentioned that to be suitable for use as a fish house, a shed should have (a) a length that is approximately twice its width, (b) a shallow pitched roof, (c) no windows in the side walls, and (d) a door in the end as opposed to one in the side. At the risk of repetition I will cover those design requirements again, but this time in more detail.

Although versatile in construction a shed that conforms to the above requirements is a rare thing, and one is left with two alternatives. Build one from scratch, or buy the nearest thing possible from a reputable garden shed supplier. Either way it will prove expensive, as wood is no longer cheap, but buying a shed can be made a little easier through one of the credit facilities that most suppliers offer. This is worth a second thought because initial outlay is bound to be high, without the cost of the shed added to it. By spreading the cost of the shed over a one-or two-year period a self-supporting fish house should pay its own instalments over the second half of the repayment period.

The hypothesis that a fish house should ideally be twice as long as it is wide applies only to the smaller, shed type fish houses where there is insufficient space available to accommodate a central bank of tanks. At this size full use must be made of the side walls for tank frame support purposes, and a minimum of space must be wasted. Figure 1 shows two possible shed designs, both with a floor area of some 72 sq. ft. The advantages and disadvantages of each design should be readily apparent. The arrangement of tanks in shed 'A' is neat and tidy and there are no access problems to any of them. Whereas shed 'B' not only has fewer tanks overall, their arrangement is untidy, and they create inaccessible and dark corners. The heat loss in the wasted space of shed 'B' must also be taken into consideration. Air loses its heat more rapidly than water, and whilst it is convenient to have plenty of working space it is in this case an expensive luxury.

The dimensions indicated on Figure 1 are optimum. In practice the size of the tanks and the size of the central working space would be slightly smaller than indicated. The reason for this is that shed sizes are normally quoted as outside dimensions and the overall length and width available for use inside the shed can be up to 6 inches less. Also, even when using the most space saving tank support frame design possible, some space is still lost to the framework. Hence the actual working width in the centre of shed 'A' would be something less than 2ft. 6 inches, and similarly in shed 'B' the central width would be slightly less than 4ft 6 inches.

The roof should not just be thought of as the top of the shed, it is an integral part of the fish house

and must be made to play a part along with the rest. With a shallow pitched roof the minimum amount of space (and heat) will be lost in the virtually unusable roof cavity, and if a height of about 6 ft. to the eaves is aimed for, tank organisation within the fish house can be made easier. With 6ft side walls the top of the highest tank is then limited to about 5ft. 6 inches, which is not really important, but it does mean that the upper tanks are accessible without a step-ladder. This makes life a little easier for tank cleaning and filling, especially if filling is a bucketing process. The roof should also have built-in, double glazed skylights. I know of no factory made shed unit where these are fitted as standard, so this is yet another do-it-yourself job. The skylights are really essential because (a) wall space is too valuable to be lost on windows, (b) natural light and heat can be utilised to help with the running costs, and (c) fish and plants seem to appreciate light coming from what is to them the natural direction. The skylights should provide a light area of at least one-tenth of the floor area.

Floors supplied with factory made shed units are not at all suitable as floors in a fish house. They are far too flimsy in construction to support the intended weight of tanks and water, which when the fish house is fully equipped could amount to 2 or 3 tons. A concrete floor is a necessity. Wooden floors should never be seriously considered because of the many problems they are liable to present through rotting, warping, springing, and being generally unsuitable to cope with water drainage and spillage.

If a concrete base is to be laid especially for the fish house several things can be done at that stage to save time and money later. Initially the base should be laid on a sheet of suitable grade polythene, and a 1 inch (minimum) thickness of expanded-polystyrene should be incorporated in the base. The polythene will act as a damp-proof membrane, whilst the expanded-polystyrene will give the floor a heat insulation layer. I have heard of cork chippings and other insulating materials being added to a cement mix to increase the heat insulation factor of the subsequent concrete, but have no personal experience in this matter and cannot comment on the results. It is also useful at this stage to incorporate a 2 to 3 inch high, by 2 inch wide, lip around the edge of the base, on which the shed will sit, and if adept enough also fit the shed holding-down bolts in the lip. The lip then lifts the shed clear of the water that is ever present on the floor, and will also contain all floor water within the bounds of the fish house. And by no means the least important of the facilities to be incorporated into the base at this stage is the drain. However, enough has already been written on the virtues of the internal fish house drain, in this, and the previous article to risk reiteration.

Before, or during the shed construction and erection both the inside and the outside sections should be

treated with several coats of a wood preservative. It is important to the future life of the shed that this operation is carried out properly at this assembly stage, because once the shed is erected and insulated the inner walls will no longer be accessible.

The inner walls and roof of the shed must be thoroughly insulated against heat loss if the subsequent running costs are to be kept to a minimum, and there are several materials that can be used for this purpose. With a wooden shed one must not over-look the fire risk aspect, and for this reason I always choose a non-combustible insulating material such as fibre-glass. An inner liner to cover the insulating material and form the inner shell of the fish house is nearly always necessary. This again presents us with a choice of materials, ranging through the hardboards and the ply-sheets to the various compound sheets now available. Once again I would recommend a non-combustible material such as the asbestos/cement sheets. Before fitting the lining material however, a sheet of polythene should be placed between it and the insulating material to act as a damp-proof membrane.

When lined-out, the inside of the fish house should be sealed and then painted to form the first line of defence against the damp and condensation. The final coats of paint can be a water-based swimming pool paint, which is chemically safe, should condensation drip from the roof into the tanks, and is claimed to be water-proof. Where the fish house has been lined out with a combustible material such as hardboard sheets, the fire risk is perhaps the more important consideration, and in this case the final coats of paint should be a flame-proof or flame-retardant paint. This may seem a small precaution, but it is one well worth taking where one may be subjected to trouble from arcing electrical equipment, or malfunction of a space heater. In all instances the paint should be white for maximum light reflection.

At this stage some hobbyists would be inclined to fit the tank support framework and tanks into the fish house. This could prove rather premature, because whilst the fish house is still empty and relatively easy to work in, it is an ideal time to install the basic electrical circuitry. Lights for evening working, and possibly a power point for a power filter or similar, are perhaps essential, but from the safety aspect electricians within the fish house should be kept to the absolute minimum.

The ultimate in fish house design is complete self-containment, and a custom-built fish house can do much to fulfil this objective. Many of the amenities that would have taken up valuable space in a smaller fish house can be incorporated in a larger unit, and the day-to-day running can become easier because of it. As the fish house itself would really be just a scaled-up version of the shed-type fish house it is the extra amenities that I shall now discuss, rather than

the design of a larger fish house.

Double air-lock doors at the main entry/exit will reduce the heat loss considerably, and a sink with an adjustable work surface will enable tanks, gravel and equipment to be washed and sterilised within the confines of the fish house. Storage (in rain water butts, plastic dustbins, or fibre-glass tanks) of ordinary tap water, soft water and peat water in reasonably large quantities will ensure a ready supply of pre-heated, aged water for almost all breeding tank set-ups and water change requirements. Open shelving can be fitted above the sink and work area to store food stocks and other miscellaneous items required for day-to-day running. Unless there is a need to lock-up potentially dangerous chemicals, cupboards are not really suitable in fish houses because of their tendency to become damp and mildewed.

If largish quantities of fish are to be bred an outlet is obviously required for surplus fish. Even when fish are bred specifically to obtain show specimens a large number of fish will be left as surplus to requirements after those with showing potential have been selected. The ways in which the fish can be disposed of is not really the subject of this article, but organisation up to the point of despatch is quite relevant because it has a small but significant bearing on the design of a fish house.

Most hobbyists run their fish houses on a spare time basis, which means that only the evenings, weekends and (very) early mornings are available for catching, grading and despatching of fish. And for those with little experience in this field I will just mention that the process of catching, grading, bagging and packing of as few as 500 fish can take at least two hours or so. If, as is often the case, the fish have to be despatched in the morning, it could mean a very early start and rushed process if all the work is left to the morning of despatch. The situation can be eased however, by using self-stacking plastic trays. Those I use are each about 30 inches long by 14 inches wide and 6 inches deep, and will, with the use of clean fresh water and light aeration, hold up to 100 fish for a period of 24 hours. Using these trays the fish can be caught, graded and counted on the evening prior to the morning of despatch, which then leaves only the bagging and packing for the morning when time will undoubtedly be at a premium. The trays

have numerous other uses in the fish house, and are particularly useful when grading, sorting, or sexing fish.

If plastic trays are used then storage space must be allocated, both for when they are in use, and for when they are not in use. If this is overlooked the undoubted usefulness of the trays will be overshadowed by the fact that they are always in the way, or are not to hand when most needed. Also to be considered if the fish are to be despatched any distance on a regular basis is the provision and storage of an oxygen bottle and apparatus for charging fish bags with oxygen. These are again small but important points that must be fitted into the basic design if the fish house is to become an economical, self-contained unit.

Taken individually, many of the points that have been discussed may appear nugatory but like many aspects of life it is not the big things, but the gradual accumulation of the small items that prove to be our undoing. The first step to losing a relative beginner from the hobby is often the misled, or mistaken purchase of a small Oscar, or similar, for their treasured community tank. The subsequent steps can follow a gradual but definite process of little Oscars getting bigger every day until a stage is reached where one disillusioned beginner has only one large Oscar and an unattractive, unplanted tank that will very likely end up for sale. More experienced hobbyists are prone to making similar errors of judgement if they increase their tank holdings by one, then another and another, until the stage is reached where the whole collection has got rather out of hand. The various pressures of such a disorganised collection then gradually build up and often culminate in the familiar advertisement 'Fish tanks for sale.'

In both examples, the fault lies in the lack of basic research. The beginner should have read his text books before making the unwise purchase, and similarly, the more experienced hobbyist should have planned his expansion. Initial research and planning costs little or nothing. Designing and setting-up a fish house or fish room to your particular needs may cost a little more initially, but its eventual running will be less costly in time and money, than the alternative of a disorganised collection of tanks that is often just the beginning of the end for some hobbyists.

THE COLOURFUL "LIMIAS"

Riccia or similar floating plants. Large females will produce large broods (over 100 is not uncommon) at four to five weekly intervals.

The young are quite large at birth and grow quite rapidly, although, it can take over four months before you know just how many males and females you have got.

So there we are: six livebearers which should be

continued from page 176

more readily available than they are despite their two main drawbacks: higher than average temperatures and late maturity. This latter point doesn't stop shops from stocking large Sailfin Mollies, however, which can take up to two years to reach maturity, so it shouldn't really count against the Limias.

Let's hope that in time the Limias become as popular as the mollies or swordtails—they deserve to.

"GRANNY"

by G. Gardner-Hobbs

MY HUSBAND and I are very fortunate that we live on the island of St. Lucia in the West Indies.

We were considerably enthused by a friend of ours, John Loader, who had kept tropical fish in the U.K. for many years. We started in a small way with Guppies, Mollies and Red Swordtails. A few weeks later, after my husband, Malcolm, had read as many books as he could lay his hands on, we increased our two tanks to six 24 in. x 12 in. x 12 in. plus seven 12 in. x 6 in. x 6 in. plus one odd tank 12 in. x 8 in. x 8 in. loaned to us by a friend. Our fish

suddenly exploded to three broods of red swordtail fry, approximately one hundred and fifty in all, plus about 40 mixed guppy fry, all highly prized by our eight year old son, Julian.

We then became interested in what aquatic life may be found in our local rivers. Packing a picnic and after depositing our two and half year old daughter, Erika, with a friend, we went equipped with nets and buckets to a nearby river. With the help and hindrance of some local children, we found some Gobies (*Dormitator maculatus*) and freshwater



"Granny," the endearing Porcupine Fish

crayfish, plus some native guppies. We also found one little fellow which we were unable to identify. He was most interesting and we nicknamed him the vacuum cleaner as his main object in life was to shovel sand into his mouth and pump it out in massive clouds from his gills. This fish was about two and a half inches long with his eyes on top of his head. His pectoral fins were used much like legs, and it used to look very much like a lizard. On its body it had a marbled pattern of dark brown on a light brown background.

We took it out of our show tank as it stirred up the sand so much that it made the water cloudy, but unfortunately it upped and died before we could identify it. Judging by the numerous illustrations examined by us, it would appear to have been some sort of mudskipper.

We were going along very nicely with our freshwater tanks when someone brought us a very large Sergeant Major (*Abudefduf saxatilis*) in a very small milk tin.

Malcolm, who has studied very extensively on marine aquaria, was very dubious whether we could keep it. Armed with buckets and bowls, we rushed to the nearest beach to collect gravel, sand and seawater. After much preparation we set up one of our two foot tanks with two underbed filters, one outside filter and an air stone.

We placed the s/major fish in the tank. It looked very bruised and battered, but it swam around quite happily. After a couple of days we noticed that it had fin rot so we painted it with mercurochrome. After two more days it died—perhaps it was the mercurochrome! We found out afterwards it had been caught by fishermen in a fish pot and thrown in the bottom of the boat with the rest of the fish for quite a while. It was surprising that it lasted four days. We decided to change the water and maintain the tank for further use as we already had it set up.

A few days later the same person brought us four very pretty fish, a targetfish (*Therapon jarbua*) also called Crescent perch, about four inches long, and three snappers, (Family Lutianidae). These were pale pink with a bright yellow stripe running from eye to tail, with the tail being the same colour, and all had bright orange eyes, like children's teddy-bear eyes. They ranged in size from about two and a half inches to four and a half inches. Then started the problem of feeding them so we tried them with a few locally caught guppies which they polished off in no time at all.

So began the every-other-day trek to a local store which has a very deep storm drain outside and which is always full of guppies. It became Julian's job after school to collect a bucket of guppies as food for the marine tank plus gobies who also consume a large quantity of guppies.

One day we were all down on the rocks by a reef,

collecting fanworms and marine algae. We were admiring the French angels (*Pomacanthus paru*) and black angels (*Pomacanthus arcuatus*) flashing in and out of the rocks and wishing we could catch some. A very funny looking fish swam around the rock my husband was standing on; he bent down and caught it in his net. He passed the net up the bank for me to examine the contents which I quickly put in the bucket as it was puffing up like a ball, Malcolm said "You don't want that awful looking thing do you?" I replied "Why not?" So we brought our Porcupine fish (*Diodon holacanthus*) home. It was about five inches long with a cream underside and lips, brown back with black and chestnut spots on its back. The pectoral fins were just like butterfly wings and it had very bright royal blue eyes when you looked at them from one angle, and emerald green from another.

This is the most interesting fish ever coming into our possession. She seemed to be tame from the very first, and we promptly nicknamed her "Granny" because she reminded us of an apple-cheeked old lady who had forgotten to put her false teeth in. Her teeth or large tooth looked more like gums, and she always looked as if she was smiling. Granny loved to have her belly tickled and she would lie in your hand underwater with no fear; if she was hungry she would do one of two things. Either pick up small stones off the bottom in her mouth or, if someone passed by her tank, she would rush up and down the tank, with her pectoral fins whirling like propellers, and champing her teeth against the glass, which could be heard about six to seven feet away from the tank. That was the signal for us to deposit six to seven guppies in to her tank. Then began the fun for she was much slower than the guppies which zoomed around the tank because of the shock of being transferred from fresh water to salt. She fixed her eyes on one and followed its movements for a while then, if she was lucky and it passed her way she was able to snap it up as it zoomed by. One day she was having very bad luck so I caught a guppy in a small net and placed the opening towards her and she swam in to the net to collect her prize. This went on for the whole meal. Now it has become a routine at every meal.

Last week we thought she was ill when we found her with her mouth wide open in the centre of the stream rising from the air stone. After studying her for some while we realised she was enjoying the sensation of the bubbles in her mouth and passing under her stomach. Now if she is bored she plays in the bubbles.

One thing we noticed, she never hides but always stays in the front of the tank for all to see.

Well, Granny has become a big attraction to all our guests staying at our inn. Should you be fortunate enough to own a porcupine fish we hope you have as much fun and entertainment as we did.

From a Naturalist's Notebook

by Eric Hardy

Great changes have taken place recently in the fish population of England's largest inland water, Lake Windermere, where roach, previously scarce occupants, are now as numerous as they have become in Scotland's Loch Ken. Southerners seldom realise how much more restricted are common coarse fish in Lakeland and Wales, where trout reign supreme. Last year, Windermere perch suffered from disease ("perchitis" of anglers) which greatly reduced their numbers until only one tenth the usual were taken in the Freshwater Biological Association traps this cold, late spring.

Predatory pike and perch kept the roach population down until almost a population explosion of roach recently followed the reduction in perch. Tench have also increased, but the roach are mostly in the backwaters.

Many of our amphibians and reptiles range much higher in the hills than is often assumed. In the West Highlands recently, I found common frogs returning from spawning in tiny peaty pools over 2,000 ft altitude above Glen Orchy and Loch Tulla, and common lizards on dry hillocks at 1,000 feet on boggy Rannoch Moor. As in the Pennines, Lakeland and Wales, the mundane palmate species is the commonest newt in Scotland. The great crested, rarest of its three newts, ranges from the Lothians and Lomond to Ness, Tay and Deeside, maybe extinct now in Caithness. Ranging no further north than the Scottish marshes of the inner Solway Firth the natterjack is its rarest toad. The sand-lizard, of course, is absent. Though the adder is the commoner of its two snakes, the grass-snake is not absent, as is often quoted from older books like Hawksworth's 1974 *Changing Fauna & Flora of Britain*. It has been found in recent years near Lomond and in East Fife.

The common slow worm seems to be scattered all over stony Scotland, even to Lewis in the Western Isles and the north of Caithness. A distribution map shows most of its records, like those of other Scottish reptiles and amphibians, in the central lowlands. But this is the main area of population, and it was a map of recorders rather than slow-worms, for there are as many old, unrepeatable records as recent ones.

The Manx Museum kindly sent me its recent annual report for the Galf of Man Bird Observatory, which includes Radley College's survey of the intertidal

marine fauna. This includes 8 sponges, 4 hydroids, 9 sea-anemones including beadlet, brown snakelocks (at Burro Neck), dahlia (Cow and South harbours and Burro Neck), Wartlet (Cow and South harbours), pale and orange plumose (Burro Neck) and dead men's fingers. Also 13 ribbon-worms (Nemertini), 5 slaters, 5 sandhoppers, 5 crabs, 14 univalve shellfish, 7 sea-slugs, 5 bivalves, 6 starfish and 5 sea-squirts or tunicates. The Australian barnacle *Elminius modestus* which reached southern Britain on wartime ship-convoys, then Liverpool in 1946, spreading to North Wales and Morecombe Bay, is not one of the three barnacles listed. More surprising, they listed only 6 fish in the rock-pools: conger, spotted goby, shanny, butterfish, sea-scorpion and Cornish sucker.

Newly-hatched larvae (nauplii) from dried eggs of brine shrimp *Artemia salina* are the routine live food for rearing marine fish like plaice during and beyond their larval stage in modern sea-fish hatchery cultivation. They are too big for turbot however, which are being reared in 30 ft. diameter old trout-project tanks at Wylfa atomic power-station, on the Anglesey coast, by a commercial enterprise. The rotifer *Brachionus plicatilis* has become its standard food for the first four days, states MAFF's new 28 page Lowestoft Laboratory Leaflet on *Fish Cultivation Research*, by Dr. C. E. Purdom. It was found that voracious wild turbot from the beaches were kept best in 8 ft. x 6 ft. fibre glass tanks with 2 ft. depth of water. Four months later, they were moved to larger pens, and fed twice daily on mashed sandeels and sprats. Mortality was about 10%. They become sexually mature after 32 months, and can be artificially stripped of eggs and sperm or they will spawn naturally in May and July. Eggs hatch in 8 days at 11-12 deg C and high oxygen levels. As with plaice and soles, a rise in temperature begins them feeding; but the rotifer food cultured on unicellular algae has to be presented at least 2 days before completion of yolk absorption, or the larvae starve and die. Heavy mortality also occurs if the algal bloom declines. After a few days, brine shrimps also cultured on algae are substituted. Three weeks later the baby turbot are weaned to mashed fish.

Spawning time can be changed with turbot and dab by increasing daylight artificially to a 12 hours day, thus making them spawn earlier. Tank-rearing has advantages over the slow maturing in low-temperature

sea-cages, as used on the west coast of Scotland. Hence the use of power-station effluent as at Wylfa, where trout farming was abandoned. Britain is too cold for practical carp-farming, states Dr. Purdom, and Atlantic salmon, which a fertiliser company is planning to farm commercially on the west coast of Scotland, makes slow growth with poor survival during its freshwater phase, he adds. Coho Pacific salmon would be better, and cod-rearing should have fewer problems than turbot; but halibut revealed intractable problems.

Bespectacled Chamaeleon

A chamaeleon wearing spectacles on its horns, positioned so that the reptile must look through them while taking aim at its prey, may seem far-fetched. But this was the way Lindesay Harkness, Oxford University zoologist, showed that the normally independent-eyed Jackson's chamaeleon swivels both eyes directly towards its target before shooting the tongue straight ahead, achieving such a depth of focus as results in accurate aim. It is certainly more serious than the story of a French poet with a pet lobster he is alleged, in a recent translation of Patrizia Krachmanicoff's very unqualified book "The Magic of the Animals," to have tamed to take it for short walks on a lead, or the shark which (it states) waits in a London aquarium with its mouth open for its teeth to be cleaned daily.

After Harkness demonstrated that chamaeleons judge distances when aiming at prey by accommodative cues from their mobile eyes, T. Collett, a Sussex University biologist, found this was achieved by the toad with fixed eyes which are better for stereoscopic range-finding. He found that toads convert disparity measurements into estimates of depth, and should be added to owl, cat and monkey as animals achieving stereopsis. Toads have an additional mechanism for measuring depth with their monocular field from the overlap of their two eyes. Frogs and toads have been shown to estimate the distance of prey almost as accurately with one eye as with two, by monitoring the

accommodative state of their eye with the prey in optimum focus.

M. C. Devine, a Michigan University Museum zoologist, has found an interesting population-control among garter snakes. After mating, the copulating male forms a plug in the female's cloaca, which temporarily prevents further mating and decreases courtship competition among the males. It prevents multiple inseminations or matings in the denning areas (old rodent-burrows) where they assemble in spring warmth. Males seem to be unattracted to females with copulatory plugs, and do not court them, probably recognising them by a chemical clue his observations suggest.

Natterjack Conservation

At Eskmeals dunes nature reserve on the Cumbrian coast near Ravenglass this June, Tony Warburton, the warden, showed me their successful natterjack breeding pools. They excavated the most productive one in the dunes. Two others, banked-up by the estuary of the River Esk, lost a lot of tadpoles when the strong winds backed up a tide to brim over the banks. Their "scrapes" or artificial pools were only 6 or 9 inches deep, and they claim that they had better results than the artificial pools made on Ainsdale (Southport) reserve because the latter were too deep. Anyway, 500 tadpoles survived the tidal inundation of their outer pools, and 1,000 were in the small inner pool. They use tinned dogfood to help rear these tadpoles, and so far suffer no predators apart from Dytiscus water-beetles. Unlike Drigg dunes across the Esk, they have no adders. Though they harbour common lizards, no sand-lizards are known.

Natterjacks have 23 British spawning sites, including Drigg dunes reserve on the other side of the estuary, not quite so successful as Eskmeals dunes; Sellafield power station a few miles north at the Calder estuary; and Walney Island at Barrow. Natterjacks have a prolonged breeding season, even though individually their early stages are shorter than common toads. They sometimes spawn so late as August.

TROPICAL QUERIES

I have just bought a fish that my dealer cannot identify other than it is a sort of barb. It is rather long in the body and of a greenish olive hue shading to silvery. The scales have dark edges. There is a dark marking behind the gill-covers, and the fins are pink, sometimes quite red. Can you name this fish for me?

Your description fits that of a cyprinid called *Leptobarbus hoeveni* from Borneo and Sumatra. As far as I know, this species is quite easy to keep and is not a danger to other fishes of about its own size.

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I would appreciate any information you can give me on *Platydoras costatus*.

This species is one of the thorny catfishes known to science as the *Doradidae*. It is a night-prowler and excellent scavenger. If placed in a community tank, make certain that a small amount of dried, live or fresh food is introduced into the aquarium last thing at night. If you neglect to do this, it is not unlikely that it will suffer severe food shortage and die before many months are out. It is native, I believe, to the upper reaches of the Amazon.

INFUSORIA

by Huw Collingbourne

ALTHOUGH commercial preparations have, to some extent, replaced *infusoria* as a first food for young fishes, there can be no doubt that a natural, living food source is, in many ways, far superior to any non-living substitute. In any case, the problems associated with establishing infusorian cultures have been frequently overstated and, as I shall attempt to explain later, little time or trouble and virtually no expenditure is involved in their establishment.

"*Infusoria*" is a general term which is normally, though not invariably, used to mean "protozoa." These are minute animals whose every function is accomplished by the single cell which comprises each individual's body. Thus, one cell feeds, digests, excretes and reproduces. They may reproduce by simple division and some species divide as often as once an hour (which explains the phenomenal growth rate of a successful infusorian culture!)

Perhaps one of the most familiar types (remembered from school instruction?) is the *amoeba*. This is normally present in the mud and rotting matter at the bottom of a pond and, if some of this matter be placed in a glass tube which is then left for some hours, should any amoebas be present they will be seen on the side of the tube.

Another (smaller) protozoan is the *paramecium* or "slipper animal" which is common and is likely to develop in abundance in home cultures. A pure *paramecium* culture may be obtained from certain biological supply agencies.

In addition to the *protozoa*, there are other types of slightly larger microscopic animals which may be present in "*infusoria*." These are the rotifers (Phylum: ROTIFERA) of which there are more than five hundred identified British species. Most of them are free-swimming but some attach themselves to water plants. They are characterised by a crown of cilia (small filaments) which, moving rapidly, conduct particles of food to the mouth. In free-swimming species the cilia perform the additional function of propelling the animal through the water.

A curiosity of rotifers is that practically all those individuals which may be isolated will be found to be

female. The males are small and degenerate and play but a small role in the survival of the species, for most rotifer eggs develop without fertilisation, the exception being a "resting egg" which is laid and fertilised late in autumn to remain intact throughout the winter, the young only hatching with the arrival of the milder weather of spring.

Whether the aquarist be primarily interested in microscopic study or simply in the production of large numbers of protozoans to feed to fish fry, he will want to learn a simple method of producing *infusoria*. The equipment needed is basic: a large jar (e.g. a sweet jar or a large pickle jar), some old aquarium water or strained pond water and a little vegetable matter.

Having filled the jar with water you will need to place it in a warm position but out of direct sunlight. A little rotting vegetable matter should be added to encourage bacterial growth. Hay, withering lettuce leaves or banana skins are old favourites. Care must be taken, however, for if too much is added, the bacterial growth will be too rapid and you will end up with a jar full of smelly water and little else! Just enough bacteria should develop to feed the infusorians which will follow.

In the first stage of development the water will become cloudy and will give off a slight smell but (if you have been careful to include no more than a small amount of vegetable) this will soon pass; the infusorians will restore the clarity and remove the odour.

At this stage the infusorians may be seen, if the jar is held up to the light, resembling a cloud of dust in the water.

They may be syphoned into a tank of new-born fish or added in drops with a pipette or eye-dropper.

Several jars of *infusoria* should be kept to insure a constant supply of live food. With most species of egg-laying fish *infusoria* may be fed to fry between the ages of one and ten days, though, after the first week it is a good idea to introduce, in addition, some larger food such as newly-hatched brine shrimps to feed the early developers.

Haplochromis burtoni

WHAT NOURISHES THE YOUNG DURING MOUTHBROODING?

by Doug Battle

BURTON'S NIGERIAN MOUTHBROODERS (*Haplochromis burtoni*) are, to my mind, the most attractive of the mouthbrooders and just about the easiest to breed. They grow to about 4 in. in length and are quite robustly built—a little more streamlined than acaras but on the same general line. The male in breeding condition is definitely a most attractive sight and rivals the colourful Ramirezi. The body is an overall olive/gold and as the fish swims in the light this changes to a steely blue. The dorsal, caudal and anal fins are freely speckled with orange/red spots and in particular the anal fin has a row of the spots which are used for a very specific purpose. There is also a heavy black vertical line passing through the eye and the first rays of the pectoral fins are also black. Finally, the lips are edged bright blue. In contrast the females are quite drab—the overall body colour is olive/brown with dark brown vertical patches on the body; the only colouring appears in the anal fin which has rather pale imitations of the male's red spots.

I acquired 6 young specimens from a fellow aquarist when they were about $\frac{1}{2}$ in. in length. At this size they all have similar colouring to the female but because they are greedy eaters they soon grow, especially if fed plenty of high protein foods like beef heart or earth-worms but they also seem to need some roughage or vegetable material which I provided by feeding porridge. Pretty soon one of the group became dominant and began to take on the male colourings, the first signs to appear being the red edging to the dorsal fin and the spots on the anal fin. It was not really that he bullied the other fish but just that he was quicker and managed to get his share of the food first. They are certainly not community tank fish—being a little too aggressive for smaller species. They seem fairly tolerant as regards water conditions and

temperature but seem happiest with temperatures in the middle to upper seventies and slightly acid water.

Although I had been warned that these fish would start breeding at about 1½ in. I was a bit doubtful especially as there didn't seem to be any signs of sexual awareness among my six fish at this size except that I was able to pick out this one male and could guess at a female—wrongly as it later turned out.

Some couple of weeks after the first male developed I noticed that one of my fish was keeping by itself and didn't seem to be feeding. My first reaction was that it was about to succumb to some disease so I decided to keep a very wary eye on it. At the next feed this was still by itself and hiding among the weeds and I was convinced that something was wrong and then, as I watched, the big male came along and started to show off in front of her and I had my first clue that she was carrying eggs in her mouth. She didn't stay to watch the male run through his paces but retired from the scene with her mouth tightly closed. I could hardly believe my luck as the male fish was barely 2 in. in length and the female slightly smaller. I realised that I would have to get the female out on her own if the eggs were to survive but I didn't think I need hurry at least until the next day. How wrong can one be—the next morning the eggs had gone—at least the female no longer carried them. I consoled myself by thinking that they were probably infertile and had been eaten for that reason, but I will never know for certain.

Everything settled down again and I began to think I had dreamt the whole episode until about a fortnight later I was fortunate enough to witness the entire spawning process. The male in all his finery started displaying in front of the female and encouraging her to peck at the red spots on his anal fin. As she did so

he seemed to curl round and nudge at the spots on her fin. They swam in this sort of circular motion for some seconds with the male gradually leading her to a nearby rock and here, with much heightened activity, the female was induced to lay her eggs. At the time I imagined the batch of eggs to be about twenty of a pinky/red hue. Immediately she turned and picked them up in her mouth and the male displayed in front of her again and again she appeared to peck at the dots on his fin. Some aquarists say that when the female has picked up the eggs and the male encourages her to peck at the spots on his anal fin which are quite fair imitations in size, shape and colour of the real eggs, he releases his milt which the female takes into her mouth and fertilization then takes place. From my observations this would appear to be the case as I didn't see the male go near the eggs at all. In fact, he was hardly given a chance as the female was so quick. They went through the whole process again and the female appeared to have a mouth full of eggs and would take no more interest in the male's display. In fact, she darted off into the weeds and hid. I decided to leave her where she was and await developments. For the next two days there was no change, the female still with a full mouth and hiding in the weeds. At this stage I decided to take the plunge and get the female off on her own. I felt sure that if I could manage it quickly and without too much disturbance she would keep the eggs. Naturally, things did not go well—try as I might I was unable to sneak up and net her and in the end a chase developed but no harm was done as she made no attempt to discard the eggs and I got her installed in a small tank of about 9 in. x 6 in. x 6 in.

After ten days there was still no sign of the fry although the female still had her mouth full and was very wasted in appearance. This appearance is enhanced by the fact that the head, and particularly the throat pouch, appear so full and the stomach so empty. However, with care it was possible to see the black of the young fry in the female's mouth. But it took another two days before she felt sufficiently secure to allow the fry out at all. When they did emerge I was surprised at the size they had attained—about as large as newly-dropped guppies. There were 38 of them and it must have been a very tight squeeze in the female's mouth. At the least shadow they would all scuttle back into the safety of her mouth and this lasted about another two days. As soon as they got too big to all get back in her mouth it was, I realised, time to separate them even though the female was still trying to protect them from real and imaginary foes.

All in all a most rewarding and interesting fish to keep and breed but one that leaves me with a question on my mind—what did the fry eat during the fifteen days they spent in the female's mouth? If you think, there must be a period of at least five days after the

yolk sack has been consumed when the fry have gained nutrients from somewhere. I can't really subscribe to the theory that during that time they eat *infusoria* taken in with water as their mother breathes. In my case they were in such a small quantity of water that they would have soon exhausted that source. I wonder if the mother somehow produces any food for her fry? And could this be the reason for the wasted appearance of the fish? After all I have, at holiday times, left my fish for a fortnight and on my return they have only looked slightly sleeker than they do normally. They have never shown such exaggerated symptoms as the female did. It would be very interesting if perhaps one of our more learned colleagues could give his opinion or even the findings of experiments on this aspect of mouthbrooders.

PRESS RELEASE

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Junior Aquarist

HIGH PROTEIN PELLETS AND DROPSY

by Jennifer Kind (age 16 years)

THREE YEARS AGO I purchased a young male goldfish which was placed in an outdoor pond, and about the same time I commenced feeding the pondfish (goldfish and golden orfe) with high protein pool pellets. The newly purchased goldfish readily took to the pellets and ate them more avidly than the others, seeming to be able to consume more than the rest of the fish. Due to the high protein content of the pellets the young goldfish grew rapidly and naturally I was pleased with the results.

However, during the winter of 1976 I noticed his belly seemed abnormally distended, but hoped this was due to premature swelling of the gonads in preparation for spring. Soon though, it was evident by his greatly distended belly, raised scales and slow rolling efforts to swim that he had developed dropsy, so I isolated him in a tank in the shed. Since death seemed the inevitable consequence, I attempted to alleviate his condition by drawing out some fluid with a hypodermic syringe. However, this only gave temporary relief and on March 11th '77 he died. A post mortem revealed, apart from fluid in the abdominal cavity and very watery flesh, an enormously enlarged liver, pale in colour and friable in texture, which had ruptured its capsule, the symptoms indicating fatty degeneration of the liver.

This death by dropsy recalled observations from the previous season on some tadpoles of the common frog which I am accustomed to rear each year. I had tried the high protein pool pellets on the tadpoles, noting their precocious development and on their metamorphosis it became evident that the tadpoles had symptoms of dropsy—fluid collecting in their abdomens.

From these results I decided to conduct an experiment to investigate the effect of feeding high protein pool pellets to tadpoles of the common frog (*Rana temporaria*), since there appeared to be a connecting

link between the cases of dropsy in both fish and tadpoles.

On March 22nd 1977 some frogs spawned in my pond and immediately one batch of fertilised spawn was placed in a clean 24 in. × 12 in. × 12 in. tank filled with aged tapwater and containing a few waterplants.

Three tanks of equal size and similar material were set up and labelled A, B and C respectively. An equal volume of water was added to each tank and all the tanks were exposed to the same amount of light intensity.

By April 19th, all the tadpoles had hatched and were treated in the following way:

36 tadpoles were removed from the 24 in. × 12 in. × 12 in. tank and 12 of these tadpoles were placed in each of the three tanks.

Tank A contained 12 tadpoles which were to be fed exclusively on high protein pool pellets. Any algae was removed from the tank.

Tank B contained 12 tadpoles which were to be fed exclusively on algae which was allowed to grow in the tank.

Tank C, the control tank, contained 12 tadpoles which were to be fed on equal amounts of the pool pellets and algae.

The tanks were cleaned out at regular intervals to control the growth of algae etc. where necessary. The results were recorded.

Results

In tank C, two tadpoles died, therefore 10 remained. 12 tadpoles remained in tanks A and B.

Firstly the development of the tadpoles in tanks A and B showed similar rapid growth. Soon, however, the tadpoles in tank A showed distention of the abdomen.

In tank C the tadpoles remained noticeably smaller. Development of legs and other adult features was more rapid in the tadpoles in tank B than those in tank A. Development was slowest in the tank C tadpoles.

By June 25th, all the tadpoles in tanks A and B had metamorphosed into adult frogs. However, in tank C, 4 tadpoles remained with vestigial hindlimbs.

Characteristics of the young frogs

Tank A—well developed bodies, large watery abdomens, indicating dropsy.

Tank B—well developed bodies, no signs of dropsy evident.

Tank C—less well developed bodies, no signs of dropsy evident.

From these results there is an indication that feeding high protein pool pellets in excess to herbivorous creatures e.g. frog tadpoles and goldfish, may be a contributory factor towards fatty degeneration of the liver, resulting in ascites (dropsy). However, it may only occur in fish which are herbivorous in nature, since their liver cells may be unable to cope with the demands imposed on them for deamination of the proteins present in the food.

Perhaps this condition would not occur in carnivorous fish? Have any other readers had any similar experiences?

MY MARINE DREAM

by J. D. Sidaway (age 12 years)

AT THE OUTSET of maintaining exotic freshwater fishes, my genuine desire was to possess a tropical saltwater aquarium. I gave the topic some thought and eventually decided to have a go.

Initially my principal problem was the choice of filtration systems. But finally after some consideration I chose to employ the 'semi-natural' system. According to the books this was less risky and more trouble-free than either 'natural' or 'clinical' systems.

I reasoned that the waters from which coral fishes originate are turbulent and therefore well oxygenated. Since I intended to duplicate reef conditions as near as possible in my subaqua world, I decided to employ vigorous aeration.

In dealers' tanks I had noticed that coral fish spend much time in hiding, and so by imaginative placing of aquarium furnishings, passages and caves could be created, allowing fish to dart in and out of hideouts as they obviously do on the reef.

I understood that coral fishes have short digestive tracts and consequently require feeding little and often. Since I planned to feed my fish only twice per day, I decided to cultivate green algae in the aquarium; this would supplement my fishes' diet in a natural way.

At this time I had a two foot tank vacant. This was all plastic, hence ideally suited for salt-water usage. Within a few months I had this tank set up and matured.

Presently I set off with high spirits to my local fish dealer. I left the shop proudly with my select purchase, one glistening 'Electric Blue Damsel.' It did not take this fish long to acclimatize to his new home and he soon commenced feeding.

My success with the 'Electric Blue' inspired me to make another purchase. This time I returned from my local store with a 'Dusky Damsel.'

Further additions over the next few months amounted to, in order of purchase:

- 1 Electric Blue Damsel,
- 1 Dusky Damsel,
- 1 Tubeworm,
- 1 Common Clown,
- 1 cleaner Wrasse,
- 1 Dancing Shrimp.

I am proud to declare that my saltwater aquarium has been successful, unfortunately however I have two losses to report. The first of these, the tubeworm, died from unknown causes. The second loss was the outcome of my ignorance. I failed to observe that the 'Dancing Shrimp' had moulted and was in the defenceless soft stage; not surprisingly he was attacked by the fish. I found him quite dead, bitten in two along his back. I hasten to add that I will certainly be more observant in the future.

Despite these minor setbacks the effort of setting up the aquarium has been worthwhile. Now I can sit back and enjoy my underwater world.



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.

THERE were 383 entries for the Llantwit A.S. annual open show. Results were as follows: Best Fish in Show: P. Willis (Aberdare). F.B.A.S. Championship Trophy: A. E. Noronha (Orpington). Aimes Cup: Miss D. Lewis (L.M.A.S.). Mr. and Mrs. Steel Cup: A. E. Noronha (Orpington). AD: 1, G. Lewis (L.M.A.S.); 2, C. Thomson (L.M.A.S.); 3, J. Thomson (L.M.A.S.). AG: 1, Miss D. Lewis (L.M.A.S.); 2, Master L. Thomson (L.M.A.S.); 3, C. Morgan (Merthyr). BA: 1 and 2, J. P. Edwards (L.M.A.S.); 3, Mr. and Mrs. M. Price (P.T.A.D.A.S.); 4, R. Brown (Blaenau Gwent). BZ: 1, P. Willis (Aberdare); 2, W. G. Best (Swansea A.S.); 3, P. Burton (Aberdare); 4, M. and B. James (Caerphilly); 5, E. A. Hillman (L.M.A.S.). CA: 1, J. P. Edwards (L.M.A.S.); 2, W. G. Best (Swansea A.S.); 3 and 4, P. Burnin (Aberdare). CZ: 1 and 5, J. P. Edwards (L.M.A.S.); 2, W. G. Best (Swansea A.S.); 3, A. E. B. Fouracre (P.T.A.D.A.S.); 4, Mrs. T. Rees (P.T.A.D.A.S.). D: 1, P. and Y. Watts (Nailesea); 2, M. Gifford (Caerphilly); 3, J. Egan (P.T.A.D.A.S.); 4, R. Morgan (Merthyr). DA: 1, B. Marum (L.M.A.S.); 2, P. and Y. Watts (Nailesea); 3, G. Lewis (L.M.A.S.); 4, Mr. and Mrs. R. L. Cotton (P.T.A.D.A.S.). DB: 1, W. G. Best (Swansea A.S.); 2, Mr. and Mrs. R. Thomas (Presell); 3 and 4, J. Egan (P.T.A.D.A.S.); 5, G. Lewis (L.M.A.S.). E: 1 and 2, T. J. Sullivan (Merthyr); 3, R. Brown (Blaenau Gwent); 4, P. R. Fitcher (Nailesea); 5, P. Willis (Aberdare). EA: 1, A. E. R. Fouracre (P.T.A.D.A.S.); 2, J. Egan (P.T.A.D.A.S.); 3, J. A. Davies (P.T.A.D.A.S.); 4, P. Willis (Aberdare). F: 1, 3 and 4, C. Morrison (P.T.A.D.A.S.); 2, P. R. Fitcher (Nailesea). G: 1, P. Burton (Aberdare); 2, C. J. Davies (P.T.A.D.A.S.); 3, Mrs. Burd (L.M.A.S.); 4, Mrs. T. Rees (P.T.A.D.A.S.). H: 1 and 2, W. G. Best (Swansea A.S.); 3, J. Egan (P.T.A.D.A.S.); 4, A. E. B. Fouracre (P.T.A.D.A.S.). BY: SY (excluding N): 1 and 3, C. H. Morgan (Merthyr); 2, M. and T. Price (P.T.A.D.A.S.); 4, B. Marum, Jr. (L.M.A.S.); 5, G. Lewis (L.M.A.S.); 6, P. Burton (Aberdare); 7, J. P. Edwards (Aberdare). K: 1, 2 and 4, I. H. Dibble (Nailesea); 3, H. Chick (L.M.A.S.). L: 1 and 3, H. Chick (L.M.A.S.); 2 and 4, P. and Y. Watts (Nailesea). M: 1, H. Chick (L.M.A.S.); 2, E. M. Brown (Blaenau Gwent); 3, G. Lewis (L.M.A.S.); 4, I. H. Dibble (Nailesea). N: 1, 3 and 4, A. E. Noronha (Orpington); 2, I. H. Dibble (Nailesea). O: 1, R. D. Perkins (Presell); 2, W. Burton (Trobridge); 3, N. Halsey (L.M.A.S.); 4 and 5, D. Wescott (P.T.A.D.A.S.). P: 1 and 5, A. E. Noronha (Orpington); 2 and 4, N. Wallace (Merthyr); 3, W. G. Best (Swansea A.S.). Q: 1, 2, 3 and 5, A. E. Noronha (Orpington); 4, J. Egan (P.T.A.D.A.S.). R: 1, W. G. Best (Swansea A.S.); 2, C. Barnsley (Dew Corning); 3, A. E. Noronha (Orpington); 4, J. Egan (P.T.A.D.A.S.). S: 1, P. Burton (Aberdare); 2 and 4, T. J. Sullivan (Merthyr); 3, A. E. Noronha (Orpington); T: 1, P. and Y. Watts (Nailesea); 2, I. H. Dibble (Nailesea); 3 and 4, A. E. Noronha (Orpington). XB-M: 1, 2 and 4, A. Ibberton (L.M.A.S.); 3, W. G. Best (Swansea A.S.). XO-T: 1, 2 and 4, A. E. Noronha (Orpington); 3, I. H. Dibble (Nailesea). U and UA: 1 and 2, G. Fry (L.M.A.S.); 3, G. Lewis (L.M.A.S.). W: 1 and 2, C. Morgan (Merthyr); 3 and 4, P. and Y. Watts (Nailesea).

A successful mini open show was held by Blaenau Gwent A.S. in June. Results: Best Fish in Show: P. and Y. Watts (Nailesea A.S.); Best Visiting Society: Merthyr A.S.; Best Livebearer: P. and Y. Watts (Nailesea A.S.); A.O.V. Egg-layer Trophy: A. M. Brown (Blaenau Gwent); Class D: P. and Y. Watts (Nailesea); Best Junior: C. Morgan (Merthyr A.S.); Class O: A. Winstone (Blaenau Gwent A.S.); Class H: J. Egan (Port Talbot A.S.); Class E: T. J. Sullivan (Merthyr A.S.). Anthony Brown Trophy went to P. Burton (Aberdare A.S.) who also won outright the C.N.A.A. Cup for the highest aggregate in the cards. Runner up was J. Egan (Port Talbot). Class Q: J. Egan (Port Talbot A.S.). Jubilee Trophy Class A.V. Goldwater: C. Morgan (Merthyr A.S.); Class P: N. Wallace (Merthyr A.S.).

TABLE show results in June of the Llantwit Major A.S. were: Cichlids (Seniors): 1, 2 and 3, J. P. Edwards; K.O.: 1, Master R. Davies; 2 and 3, G. Fry; Juniors: 1 and 4, Miss D. Lewis; 2 and 3, Master A. Fry.

THE New Forest A.S. had a very well attended June meeting, the main item that evening being an unusual quiz among members. They each were given a number of fish pictures and some cards containing Latin names which had to be correctly matched up to obtain maximum points.

The show secretary awarded prize cards to members who took their fish to the Inter-Club Show at Portsmouth A.S. on Spring Bank Holiday Sunday. New Forest were fifth out of 13 Clubs competing. Table Show Results were: Guppies: 1, R. Travers; 2, J. Menhennett; 3, P. Norup; 4, N. Guller. Labyrinth: 1 and 4, P. Norup; 2, J. Menhennett; 3, C. Head. Shubunkins: 1 and 2, T. Travers; 3 and 4, L. Menhennett.

The Secretary will be pleased to send details of the Society to any one on application, Mr. R. Travers, 6 Auckland Avenue, Brockenhurst, Hants. SO4 7RS.

RESULTS of the Accrington A.S. open show were as follows: Section A: Guppies: 1, R. D. Connel (Oram—section winner); 2, B. Morris (F.G.A.); 3, Mr. and Mrs. Baldwin (Sandgrounders). Section B: Planes: 1, Mr. and Mrs. Walsh (Blackburn); 2, H. Buckley (Northwich); 3, Mr. and Mrs. B. Durham (Longridge). Swordtails: 1, H. Buckley (Northwich); 2, J. Sykes (David Brown Society); 3, J. Marsh (Longridge). Mollies: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Holden (Longridge); 3, J. Gonzales (Leigh). A.O.V. Livebearers: 1 and 3, Mr. and Mrs. B. Durham (Longridge—section winners); 2, P. Walsh (Blackburn). Section C: Characins up to 3 in.: 1, Mr. and Mrs. Walsh (Blackburn—section winner); 2, S. Goddard (Macclesfield); 3, N. Stevenson (Oram). Characins (over 3 in.): 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, N. Stevenson (Oram); 3, R. and L. Bell (Nelson). Section D: Cichlids (up to 3 in.): 1, K. Wright (Sandgrounders); 2, N. Stevenson (Oram); 3, K. Alfred (Hyde). Cichlids (over 3 in.): 1, K. Smith (Blackpool—section winner); 2, J. Widel (Oram); 3, K. Alfred (Hyde). Rift Valley Cichlids: 1 and 3, Mrs. E. Stillwell (Sandgrounders); 2, Mr. and Mrs. Gough

(Wynnstey). Angels: 1, Mr. Holding (Accrington); 2, M. Jones (Wynnstey); 3, Mr. and Mrs. R. S. Holden (Longridge). Section E (Barbs up to 3 in.): 1, N. Stevenson (Oram); 2, E. and B. Calow (Coral Reef); 3, Mr. and Mrs. E. Lloyd (Wynnstey). Barbs (over 3 in.): 1 and 2, Mr. and Mrs. Baldwin (Sandgrounders—section winner); 3, Mr. and Mrs. Walsh (Blackburn). Section F: Aphyosemion tooth-carp: 1, 2 and 3, D. Sykes (David Brown Society). A.O.V. Toothcarps: 1, 2 and 3, J. Woon (Leigh—section winner). Section F: Laboos, sharks and foxes: 1, Mr. and Mrs. Baldwin (section winners); 2, M. Ailsworth (Darwen); 3, K. Kingley (Darwen). Section H: Danios: 1, E. and B. Calow (Coral Reef); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Mr. and Mrs. Newton (Blackburn). Rasboras: 1, Mr. and Mrs. Walsh (Blackburn—section winner); 2, Mr. and Mrs. Newton (Blackburn); 3, B. Morris (F.G.A.). Section I: Fighters: 1, 2 and 3, Mr. and Mrs. R. S. Holden (Longridge—section winners). Section J: Anabantids (up to 3 in.): 1, Mr. and Mrs. Baldwin (Sandgrounders—section winners); 2, Mr. and Mrs. Newton (Blackburn); 3, J. Sykes (David Brown Society). Anabantids (over 3 in.): 1, Mr. and Mrs. Gough (Wynnstey); 2 and 3, Mr. and Mrs. Lyons (Longridge). Section K: Pairs Livebearers: 1, P. Walsh (Blackburn); 2, Mrs. Edna Stillwell (Sandgrounders); 3, K. Wright (Sandgrounders). Pairs Egg-layers: 1, Mr. and Mrs. Walsh (Blackburn—section winners); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, B. Goddard (Darwen). Section L: Breeders Livebearers: 1, H. Jones (Leigh); 2, N. Lynne (Accrington); 3, C. Ewason (Sandgrounders). Breeders Egg-layers: 1, R. and L. Bell (Nelson—section winner); 2, E. Jones (Leigh); 3, C. Ewason (Sandgrounders). Section M: Catfish and loach (up to 3 in.): 1 and 3, Mr. and Mrs. Harvey (Atlantis); 2, Mr. and Mrs. Baldwin (Sandgrounders). 1. Catfish and loach (over 3 in.): 1, Mr. and Mrs. Baldwin (Sandgrounders—section winners); 2, Mr. and Mrs. Walsh (Blackburn); 3, E. Jones (Leigh). Section N: A.O.V. Tropical: 1, P. Walsh (Blackburn—section winner); 2, Mr. and Mrs. B. Durham (Longridge); 3, J. Marsh (Longridge). Section O: A.V. Marine: 1, W. Caton (Longridge—section winner). Section P: Juniors: 1, Master P. Durham (Longridge—section winner); 2, Master C. Calow (Coral Reef); 3, Miss J. Baldwin (Sandgrounders). Section Q: Ladies: 1, Mrs. L. Lloyd (Wynnstey—section winner); 2, Mrs. Walsh (Blackburn); 3, L. A. Bell (Nelson). Section R: Mini-jars: 1, 2 and 3, N. Stevenson (Oram—section winner). Section S: Common goldfish and comers: 1, Mr. and Mrs. B. G. Conroy (Morecambe Bay); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, C. Wallbank (Accrington). Moors: 1, C. H. Whitely (Accrington); 2 and 3, F. Foote (Accrington). Veiltails: 1 and 2, Mr. Duckworth (Independent); 3, C. Wallbank (Accrington). Shubunkins: 1, C. Wallbank (Accrington); 2, Mr. Duckworth (Independent); 3, F. Foote (Accrington). Koi Carp: 1, Mr. and Mrs. Dawson (Heywood); 2 and 3, S. Walsh (Accrington). Fantails: 1 and 2, F. Foote (Accrington); 3, C. Wallbank (Accrington). Orandas: 1, Mr. Duckworth (Independent); 2 and 3, R. N. Dingley (Heywood). Lionheads: 1 and 2, R. N. Dingley; 3, S. Holden (Accrington). A.V. Goldwater: 1, B. Haworth (Accrington—section winner); 2, S. Walsh (Accrington); 3, F. Foote (Accrington). A.O.V. Fancy goldfish: 1, B. Haworth (Accrington); 2, F. Foote (Accrington). Twin-tail Breeders: 1, D. Duckworth (Independent); 2, Mr. and Mrs. Tasker (Sandgrounders); 3, F. Foote (Accrington). Single tail breeders:

THE SAFE CURE FOR FUNGUS

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1 and 2, Mr. and Mrs. Tasker (Sandgrounders). Best in Show was won by Master P. Durham gaining 78 pts. for his Zebra damis in Section P Juniors.

OPEN SHOW results from **Swillington A.S.** are as follows: Best in show: A.O.V. Catfish owned by C. Garrick of Castleford. Guppies: 1, Mr. and Mrs. Riley (Castleford); 2, A. Young (Hull); 3, T. Faux (Merseyside). Plantes: 1 and 3, Mr. and Mrs. Petty (Castleford); 2, A. Hill (Barnsley). Mollies: 1, Mrs. G. Frisby (Hull); 2, M. Price (Castleford); 3, Mr. Harrison (Grimsby). Swordtails: 1, Mr. and Mrs. Roberts (Doncaster); 2, A. Piggott (Grimsby); 3, Mr. and Mrs. Nunn (Independent). A.O.V. Livebearer: 1, Mr. and Mrs. Petty (Castleford); 2, Mr. and Mrs. Tilling (Immingham); 3, B. Jackson (Doncaster). Small Barbs: 1, C. Garrick (Castleford); 2 and 3, M. Price (Castleford). Large Barbs: 1, Mr. and Mrs. Roberts (Doncaster); 2, J. and H. Snowden (Independent); 3, Mr. Stevenson (Castleford). Small Characins: 1, G. Cox (Swillington); 2, Mr. and Mrs. Price (Castleford); 3, J. Benton (Morley). Large Characins: 1 and 2, J. Benton (Morley); 3, M. Price (Castleford). Small Cichlids: 1, Mr. and Mrs. J. Riley (Castleford); 2, B. Campbell (Castleford); 3, P. Foster (South Leeds). Large Cichlids: 1, M. Price (Castleford); 2, Mr. and Mrs. Hopkinson (Darfield); 3, Mr. and Mrs. D. Willey (Scarborough). Angels: 1, A. Piggott (Grimsby); 2, Mr. and Mrs. P. Manley (Retford); 3, J. and S. Greenwood (Swillington). Corydoras and Brochis: 1, Mr. and Mrs. J. Riley (Castleford); 2, Mr. and Mrs. Lewis (Halifax); 3, Mr. and Mrs. D. Willey (Scarborough). A.O.V. Catfish: 1, C. Garrick (Castleford); 2, T. Sanderson (Thorne); 3, Mr. and Mrs. Chadwick (Independent). Loach and Botsia: 1, T. Sanderson (Thorne); 2, Mr. and Mrs. Daines (Doncaster); 3, A. Piggott (Grimsby). Fishers: 1 and 2, Mrs. E. Faux (Merseyside); 3, J. and H. Snowden (Independent). Small Anabantids: 1, Mr. and Mrs. P. Manley (Retford); 2, D. Copsey (Morley); 3, L. Bush (Morley). Large Anabantids: 1, Mr. and Mrs. Lewis (Halifax); 2, A. and N. Shaw (York). Sharks and Foxes: 1, A. Piggott (Grimsby); 2, T. Sanderson (Thorne); 3, D. Copsey (Morley). Ras. D. M.: 1 and 3, I. Duncan (Hull); 2, A. Piggott (Grimsby). Regulating Tooth-corns: 1, 2 and 3, A. Young (Hull). Pairs: Livebearers: Mr. and Mrs. Tilling (Immingham); 2, P. Camfield (Castleford); 3, Mr. and Mrs. Agar (Aireborough). Pairs: Baylagers: 1, J. Duncan (Hull); 2, A. Frisby (Hull); 3, A. Rossion (Independent). Breeders: Live A-B: 1, Mr. and Mrs. Hopkinson (Darfield); 2, Mr. and Mrs. Tilling (Immingham); 3, Mr. and Mrs. Smith (Scunthorpe). Breeders: Live C-D: 1, Mr. and Mrs. Hopkinson (Darfield); 2, Mr. and Mrs. Agar (Aireborough); 3, T. Busfield (Barnsley). Breeders: Egg A-B: 1, Mrs. B. Faux (Merseyside). Breeders: Egg C-D: 1, A. Piggott (Grimsby); 2, Mr. and Mrs. Petty (Castleford); 3, J. Benton (Morley). A.O.V. Tropical: 1, A. Frisby (Hull); 2, T. Sanderson (Thorne); 3, Mr. and Mrs. Smith (Scunthorpe). Juniors A-V: 1, Master R. Gassby (Bradford); 2, Miss J. Hopkinson (Darfield); 3, Master D. Frisby (Hull). Novice A.V.: 1, Mrs. J. Harrison (Grimsby and Cleethorpe); 2, P. Camfield (Castleford); 3, G. Cox (Swillington). Common Goldfish: 1, T. Busfield (Barnsley). Fancy Goldfish: 1, Mr. and Mrs. Hopkinson (Darfield); 2, K. and M. Wood (Bridlington). A.O.V. Coldwater: 1 and 2, K. and M. Wood (Bridlington); 3, J. and S. Greenwood (Swillington). The Best Society was Castleford with

42 pts., second being Hull with 25 pts. and third Grimsby with 15 pts.

SHOW Results for June from Pressell T.F.S. were: Livebearers: 1, N. Howes; 2 and 3, P. A. Busby; 3, Mrs. R. Lewis; 4, Mrs. N. Cosmbe. Barbs: 1, R. Purdus; 2, R. Mayhew; 2, 3 and 4, P. A. Busby. Egg-layers: 1 and 2, R. A. J. Thomas; 2 and 4, R. Mayhew; 3, P. A. Busby; 3, Mrs. R. Lewis. Cichlids: 1, R. A. J. Thomas; 1, 2 and 4, R. Mayhew; 2, R. Purdus; 3, P. A. Busby. Judge was Mr. and Mrs. J. Buck.

THERE were 248 entries for the open show of the **Loyne Aquarists (Lancaster)** in June. Best Fish in Show awards was by K. Thompson (Merseyside). Results: Section 1: Class 3: 1 and 2, Mr. and Mrs. Tasker (Sandgrounders); Class 4: 1 and 3, A. Unsworth (St. Helens); 2, S. Tomlinson (Macclesfield); Class 5: 1, Mr. and Mrs. Houghton (Southport); Section 2: Class 1: 1 and 3, B. Faux (Merseyside); 2, Mr. and Mrs. Campbell (Macclesfield); Class 2: 1, Mr. and Mrs. Campbell (Macclesfield); 2, Mr. and Mrs. Chambers (Southport); Section 3: Class 1: 1, Mr. and Mrs. Houghton (Southport); 2, B. W. Carter (St. Helens); 3, D. Algie (St. Helens); Class 2: 1, Mr. and Mrs. Hodge (Southport); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Houghton (Southport); Class 3: 1, Mr. and Mrs. Chambers (Southport); 2, Mr. and Mrs. Campbell (Macclesfield); 3, D. Algie (St. Helens); Class 4: 1, Mr. and Mrs. Wallbank (Loyne); 2, Mr. and Mrs. J. McCartney (St. Helens); 3, Mr. and Mrs. Campbell (Macclesfield); Class 5: 1, Mr. and Mrs. Campbell (Macclesfield); 2, Mr. and Mrs. J. McCartney (St. Helens); 3, D. Faux (Merseyside). Section 4: Class 1: 1, N. Wallbank (Loyne); 2, W. Hayes (Loyne); 3, J. T. Morris (Ashton-in-Makerfield); Class 2: 1 and 2, Mr. and Mrs. Houghton (Southport); 3, Mr. and Mrs. Underwood (Southport); Section 5: Class 1: 1, Mr. and Mrs. Houghton (Southport); 2, J. Faux (Merseyside); 3, W. Hayes (Loyne); Class 2: 1, Mr. and Mrs. Aspinall (Southport); 2, J. Faux (Merseyside); 3, Mr. and Mrs. Underwood (Southport); Class 3: 1, Mr. Bauer (Merseyside); Class 4: 1, B. Faux (Merseyside); 2, J. T. Morris (Ashton-in-Makerfield); 3, Mr. and Mrs. Houghton (Southport); Section 6: Class 1: J. P. Morris (Ashton-in-Makerfield); 2, K. Thompson (Merseyside); 3, B. W. Carter (St. Helens); Class 2: 1, Mr. and Mrs. Houghton (Southport); 2, P. and H. Batchelor (Loyne); 3, N. Wallbank (Loyne); Section 7: Class 1: 1, W. Hayes (Loyne); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Houghton (Southport); Class 2: 1, Mr. and Mrs. Houghton (Southport); 2, N. Wallbank (Loyne); 3, Mr. and Mrs. Aspinall (Southport); Class 3: 1, Mr. and Mrs. Chambers (Southport); 2, Mr. and Mrs. Tasker (Sandgrounders); 3, T. and S. Heywood; Class 4: 1 and 2, K. Thompson (Merseyside); 3, D. Faux (Merseyside); Section 8: Class 1: 1, K. Thompson (Merseyside); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, J. P. Morris (Ashton-in-Makerfield); Class 2: 1, Mr. and Mrs. J. McCartney (St. Helens); 2, Mr. and Mrs. G. Brown (Southport); 3, Mr. and Mrs. Chambers (Southport); Section 9: Class 1: 1, J. and K. Hinchey (Loyne); 2, T. Faux (Merseyside); 3, Mr. and Mrs. Underwood (Southport); Class 2: 1 and 2, Mr. and Mrs. Hodge (Southport); Section 10: Class 1: 1, Mr. and Mrs. Houghton (Southport); 2, B. and W. Carter (St. Helens); 3, Mr. and Mrs. Aspinall (Southport); Class 2: 1, B. W. Carter (St. Helens); 2, Mr. and Mrs. Houghton (Southport); 3, N. and M. Rimmer (Sandgrounders); Section 11: Class 1: 1, 2 and 3, K. Thompson (Merseyside); Class 2: 1 and 2, Mr. and Mrs. Tasker (Sandgrounders); Section 12: Class 1: 1, B. W. Carter (St. Helens); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Houghton (Southport); Class 2: 1, K. Thompson (Merseyside); 2, P. and H. Batchelor (Loyne); 3, T. Wilkinson (Loyne); Section 13: Class 1: 1, P. and H. Batchelor (Loyne); 2, Mr. Bauer (Merseyside); 3, J. and K. Hinchey (Loyne); Section 14: Class 1: 1, Mr. and Mrs. Ham (Lyonham); 2, Mr. and Mrs. Houghton

(Southport); 3, T. and S. Heywood; Section 16: Class 1: 1, R. A. Hodge (Southport); 2, M. Rimmer (Sandgrounders); Class 2: 1, Master M. Rimmer (Sandgrounders); 2 and 3, R. and W. Underwood (Southport).

THE June meeting of the **Mid-Sussex A.S.** was opened with an excellent lecture from a member of The Sussex Trust for Nature Conservation, which dealt with a lot of interesting aspects of the life to be found in the fields and woods of Sussex. The Fish Exhibition at the Park Centre, B. Hill, over the Jubilee weekend, resulted in a profit of approximately £50 to club funds.

During the evening a table show was judged by Mr. C. Corbin, who awarded the cards as follows: Characins: 1 and 2, E. and T. Tester; 3 and 4, B. Perrin; Catfish: 1, B. Stanger; 2 and 3, E. and T. Tester; Corydoras: 1 and 2, E. and T. Tester; 3, E. Stanger.

Anyone who keeps any form of Aquatic Life will be very welcome at any club meeting, which are held on the second Thursday of each month at 8 p.m. at Oakley Lodge, Oakley Lane, Keymer. Information may be obtained from Nere Aquatics, Sussex Road, Haywards Heath; Burgess Hill Aquarium, The Martlets, Burgess Hill; or from the Secretary B. Slade, Soudown, Bolney Road, Ansty (K. Heath 53747).

JUDGES L. Emery and J. Savage faced a difficult task when faced with a class of twenty five Bristol Shubunkins at the June meeting of **Bristol A.S.** Awards in this and other classes were: Bristol Shubunkins: 1, C. Summers; 2, T. Ball; 3, S. Lloyd; 4, V. Cole; Ventrais: 1, S. Lloyd; 2, G. Price; Moors: 1, J. Day; Barbs: 1, 3 and 4, Miss H. Morgan; 2, Mrs. Matthews; Loaches: 1 and 2, Miss H. Morgan; Catfish: 1, 2, 3 and 4, Miss H. Morgan.

ONCE again **Northwich and District A.S.** had a successful day including the weather for their Annual Open Show. There were nearly 400 entries. The Results were as follows: Guppies: 1 and 2, R. O'Connell (Oram); 3, Mr. and Mrs. Baldwin (Sandgrounders); Swordtails: 1, L. and D. Thorne (Northwich & D.); 2, Mr. and Mrs. Houghton (Southport); 3, D. Algie (St. Helens). Mollies: 1 and 3, Mr. and Mrs. Tinsley (Sandgrounders); 2, G. Gonzalez (Leigh); Plantes: 1, H. Buckley (Northwich & D.); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Hodge (Southport). Barbs (Small): 1, M. Collins (St. Helens); 2, R. O'Connell (Oram); 3, D. Ruckliffe (Vale Royal). Barbs (Large): 1, Mr. and Mrs. Houghton (Southport); 2, Mr. and Mrs. Gough (Wynnstay); 3, Mr. and Mrs. Baldwin (Sandgrounders). Characins (Small): 1, Miss S. Goddard (Macclesfield); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Mr. and Mrs. Goddard (Macclesfield). Characins (Medium): 1, Mr. and Mrs. Campbell (Macclesfield); 2, N. Stevenson (Oram); 3, P. Bewick (Vale Royal). Characins (Large): 1, 2 and 3, Mr. and Mrs. Houghton (Sandgrounders); Fishers: 1 and 2, G. and K. Davies (Northwich & D.); 3, Mr. and Mrs. Campbell (Macclesfield). Anabantids (Small): 1, Mr. and Mrs. McCartney (St. Helens); 2, Mr. and Mrs. Muckle (Southport); 3, D. Tomlinson (Macclesfield). Anabantids (A.O.V.): 1, Mr. and Mrs. McCartney (St. Helens); 2, Mr. G. Brown (Southport); 3, H. Buckley (Northwich & D.). Angels: 1, C. and K. Davies (Northwich & D.); 2, N. Stevenson (Oram); 3, Mr. and Mrs. Muckle (Southport). Cichlids (Dwarf): 1, R. Smith (Northwich & D.); 2, N. Stevenson (Oram); P. Smith (Northwich & D.). Cichlids (Large): 1, L. and D. Thorne (Northwich & D.); 2, Mr. and Mrs. Aspinall (Southport); 3, B. Stillwell (Sandgrounders). Danios and Minnows: 1, Mr. and Mrs. Houghton (Southport); 2, Mr. and Mrs. Muckle (Southport); 3, K. Chambers (Southport). Rasboras: 1 and 3, Mr. and Mrs. Muckle (Southport); 2, B. W. Carter (St. Helens). Sharks: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Tinsley (Sandgrounders); 3, P. Bewick (Vale Royal). Flying Foxes: 1, 2 and 3, Mr. and Mrs. Hodge (Southport). Catfish (Cory and Brochis): 1 and 3, B. W. Carter (St. Helens); 2, Mr. and Mrs. Muckle (Southport). Catfish

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(A.O.V.): 1, Poulton Bros. (Atlantis); 2, Mr. and Mrs. H. Gough (Wynnstay); 3, Mr. and Mrs. J. McCarthy (St. Helens). Loach and Botan: 1, Mr. and Mrs. Muckle (Southport); 2, B. Newport (Runcorn); 3, Mr. and Mrs. Tasker (Sandgrounders). Toothcarp (Killifish): 1 and 2, J. Noon (Leigh); 3, Mr. and Mrs. Tasker (Sandgrounders). A.O.V. Tropical: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. McCarthy (St. Helens). Livebearers (Pairs): 1, G. Bond (Southport); 2, Mr. and Mrs. M. Lawson (St. Helens); B. W. Carter (St. Helens). Egg-layers (Pairs): 1 and 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Houghton (Southport). Breeders Livebearers: 1, Mr. and Mrs. Goddard (Macclesfield); 2, E. Jones (Leigh); 3, L. Bradley (Northwich & D.). Breeders Egg-layers (1-10): Poulton Bros. (Atlantis); 2, Mr. and Mrs. Lawson (St. Helens); 3, Mr. and Mrs. Tasker (Sandgrounders). Breeders Egg-layers (11-20): R. R. and Mrs. J. Taylor (Atlanta). Section 130: 1, B. Newport (Runcorn); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, H. Buckley (Northwich & D.). R31: 1, Mr. and Mrs. Lawson (St. Helens); 2, H. Buckley (Northwich & D.); 3, Poulton Bros. (Atlantis). R32: 1, J. Buckley (Northwich & D.); 2, A. Whitaker (Macclesfield); 3, Mr. and Mrs. Harvey (Atlanta). S33: 1, L. Groves (Sandgrounders); 2, T. Brown (Warrington); 3, Miss J. Baldwin (Sandgrounders). S34: 1, Miss J. Baldwin (Sandgrounders); 2 and 3, P. and S. Taylor (Atlanta). T35: 1, 2 and 3, N. Stevenson (Ogram). Best Fish in Show (Thorne Trophy): Mr. and Mrs. McCarthy (St. Helens). Honey Gourami. Society gaining most points (Inter-Club Trophy): Southport.

THERE were 468 entries for the **Thorne A.S.** Open Show held in June. Best Fish in Show award went to Mr. L. Fletcher (Doncaster). Other results: Guppies: 1, Mr. and Mrs. Daines (Doncaster); 2, Mr. and Mrs. Riley (Castleford); 3, Mrs. Bee and Family (Grimsby and Cleethorpes). Mollys: 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Riley (Castleford); 3, M. Price (Castleford). Swordtails: 1, Mr. and Mrs. Roberts (Doncaster); 2, A. Piggott (Grimsby and Cleethorpes); 3, Mr. and Mrs. Smith (Sheffield and District). Platys: 1, Mr. and Mrs. Riley (Castleford); 2, Mr. and Mrs. Lake (South Humber-side); 3, Mr. and Mrs. Newstead (Scunthorpe & D.). A.O.V. Livebearers: 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Chester (Retford); 3, Mr. and Mrs. Tilling (Immingham). Small Characins: 1, Master S. White (Retford); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Chester (Retford). Large Characins: 1, B. Jackson (Doncaster); 2, H. Thorpe (Doncaster). 1, B. Slight (Mexborough). Small Barbs: 1, M. Price (Castleford); 2, R. Smith (York); 3, N. C. Ferrand (Goole). Large Barbs: 1, Mr. and Mrs. Roberts (Doncaster); 2, B. Catch (Independent); 3, Mr. and Mrs. Nunn (Independent). Rasboras, Danios, Minnows: 1, Master S. White (Retford); 2 and 3, A. Piggott (Grimsby and Cleethorpes). Egg-laying Toothcarp: 1 and 3, Master A. Young (Hull); 2, B. Slight (Mexborough). Angels: 1, Mr. and Mrs. Mangles (Retford); 2, A. Piggott (Grimsby and Cleethorpes); 3, H. Thorpe (Doncaster). Dwarf Cichlids: 1, Mrs. Bee and Family (Grimsby and Cleethorpes); 2, Mr. and Mrs. Berry (Scunthorpe & D.); 3, D. Harris (Mexborough). Large Cichlids: 1, Mrs. Bee and Family (Grimsby and Cleethorpes); 2, R. Smith (York); 3, B. Slight (Mexborough). Rift Valley Cichlids: 1, L. Fletcher (Doncaster); 2, M. Price (Castleford); 3, A. Frisby (Hull). Small Anabantids: 1 and 2, Mrs. Bee and Family (Grimsby and Cleethorpes); 3, Master C. Mangles (Retford). Large Anabantids: 1, Mr. and Mrs. Berry (Scunthorpe and District); 2, Mrs. Bee and Family (Grimsby and Cleethorpes); 3, T. Tidwell (Grimsby and Cleethorpes). Fighters: 1, R. Turner (Thorne); 2, J. S. Greenwood (Swillington); 3, Mr. and Mrs. Newson (South Humber-side). Corydoras and Brochis: 1, Mr. and Mrs. Chester (Retford); 2, D. Harris (Mexborough); 3, Mr. and Mrs. Riley (Castleford). A.O.V. Catfish: 1, D. Harris (Mexborough); 2, K. Watson (Worksop); 3, T. Sanderson (Thorne).

A.O.V. Loaches: 1, Mr. and Mrs. A. Binns (S.M.A.S.); 2, Mr. and Mrs. Daines (Doncaster); 3, T. Sanderson (Thorne). A.V. Sharks and Foxes: 1, T. Sanderson (Thorne); 2, Mr. and Mrs. Campbell (Scunthorpe & D.); 3, B. Slight (Mexborough). A.V. Tropical: 1, R. Bellard (Hull); 2, Mr. and Mrs. Caldwell (S.M.A.S.); 3, N. Gow (S.M.A.S.). Breeders Livebearers (A and B): 1, Mr. and Mrs. Richardson (Scarborough); 2, Mr. and Mrs. Tilling (Immingham); 3, Mr. and Mrs. Hopkinson (Darfield). Breeders Livebearers (C and D): 1, T. Bestfield (Barnsley); 2, Mr. and Mrs. Hopkinson (Darfield); 3, Master A. Young (Hull). Breeders Egg-layers (A and B): 1, B. Slight (Mexborough); 2, Master A. Young (Hull); 3, B. Banks (Thorne). Breeders Egg-layers (C and D): 1, Master S. White (Retford); 2, B. Banks (Thorne); 3, Mr. and Mrs. Petty (Castleford). Livebearers (Pairs): 1 and 2, Mr. and Mrs. Morrissey (Immingham); 3, Mr. and Mrs. Daines (Doncaster). Egg-layers (Pairs): 1, Master S. White (Retford); 2, Mrs. Bee and Family (Grimsby and Cleethorpes); 3, S. Copley (Doncaster). Goldfish and Comets: 1 and 3, K. Chapman (Mexborough); 2, Mr. and Mrs. B. Fiddell (Sheffield & D.). Fancy Goldwater: 1, K. and M. Wood (Bridlington); 2, J. S. Greenwood (Swillington); 3, M. Hutton (Goole). A.O.V. Goldwater: 1 and 3, K. and M. Wood (Bridlington); 2, J. and H. Snowden (Independent). Novas: 1 and 3, Mr. and Mrs. Nunn (Independent); 2, K. Turner (Thorne). Juniors: 1, Misses A. and L. Petty (Castleford); 2, Miss Donna Banks (Thorne); 3, Miss T. Hopkinson (Darfield).

FOUR-year-old Paul Durham surprised everybody at the **Accrington A.S.** Open Show early in June by taking three trophies including the Best in Show to become the youngest competitor in the Champion of Champions contest at Belle Vue, Manchester in October. His parents, who are members of Longridge and D.A.S. have only been showing fish themselves since last July and Paul has been to almost every show with them. An aquarium was installed in his bedroom shortly after his fourth birthday last July and he feeds his fish and helps to do the necessary cleaning. In May he asked if he could take a couple of his fish to shows and at his first one he picked up a second place in the Junior class. Then came the Accrington Show and his Zebra Danio took the Junior Section, the award for the Best Tropical Fish and the Best in Show. His mother and father could only manage Best Livebearer!

THE month of June was quite an eventful one for the **Portsmouth A.S.** beginning with the Inter-Club Show which included thirteen societies with Salisbury the outright winners. The exhibitors were well entertained by Captain John Edwards who gave an excellent lecture on reptiles and amphibians with live specimens.

The first general meeting featured a talk by Mr. J. Stillwell on the subject of livebearers. It was well illustrated with excellent drawings shown on the epidiascope. Of particular interest were the wooden models of various different livebearers which Mr. Stillwell had made for his lecture.

The second general meeting of the month was of particular interest to cichlids enthusiasts for the speaker for the evening was Mr. J. Hurler, a well-known authority on this family of fishes. His impressively prepared talk was an education to all members. At the same time there was a table show for rasboras, barbs and plants. The judge was Mr. D. Jones of Southampton and the results were as follows:

Rasboras: 1 and 2, P. Smithers. Barbs: 1, E. Binstead; 2, M. Munt. Plants (rooted): 1, Miss W. Ryder. Plants (floating): 1, P. Smithers; 2, M. Munt. Best fish in show: Chequer barb owned by Mr. Binstead.

SECTION winners at the **Longridge and District A.S.** Open Show on 11th September, will have a unique keepsake of their achievement for the Society have commissioned a local artist to produce a set of appropriate oil paintings of fish. The winner of each section will receive one in addition to an annual trophy. Most

of the trophies have been donated by local shops and firms and the local town council have donated the Best in Show trophy which will accompany *The Aquarist and Pondkeeper* Gold Pin.

It is hoped that the show will prove popular with livebearer enthusiasts as Longridge have introduced some new classes in that section. The classes will be: 1, Guppies (broadtail); 2, Guppies (narrowtail); 3, Mollys; 4, Any other Poecilia species; 5, Platys; 6, Swordtails; 7, Any other Niphophorus species; 8, Gambusia and Heterandria species; 9, Any other species of livebearer.

There are also ten coldwater classes included in the fifty class schedule.

RESULTS of the first Open Show of the **South Park Aquatic Study Society** were: Veiltail: 1, A. Green; 2, D. Seymour; 3, Mr. Lewis. Bristol type Shubunkin: 1, Mrs. H. Seymour; 2, W. G. Cook; 3, Miss D. Morris. Globe Eye: 1, A. Green. Bramblehead: 1, R. Whittington; 2, Miss D. Morris; 3, J. Webster. Bubble Eye: 1, Miss D. Morris; 2, A. Dibley; 3, D. Seymour. Pearl Scale: 1, Mrs. P. Whittington; 2, Mrs. H. Seymour; 3, A. Dibley. Common Goldfish: 1, Mrs. M. Dudley; 2, D. Seymour; 3, G. Herring. London Shubunkin: 1, Mrs. P. Whittington; 2, Mrs. H. Seymour; 3, D. Dibley. Oranda: 1 and 3, M. Barnett; 2, J. Asquith. Broadtail Mice: 1, 2 and 3, J. Kingsland. Fantail: 1, G. Herring; 2 and 3, W. J. Nimmo. Comet: 1, Miss D. Morris; 2, D. J. Mackay. Goldfish Breeders: 1, W. G. Cook; 2, J. Kingsland; 3, B. Cook. Native and Foreign: 1 and 2, L. B. Clapp; 3, R. Trim. Centrarchids: 1 and 2, E. Dunstead; 3, S. M. Dudley. Koi: 1, D. Herman; 2 and 3, L. B. Clapp. Best Basic Variety of Goldfish: R. Whittington (Lionhead). Best Fish in Show: Mrs. P. Whittington (London Shubunkin).

OFFICERS elected at the **Village Bar A.S.** annual general meeting were: Chairman, B. Meeby; vice-chairman, P. Rogers; secretary, G. Corum; treasurer, J. Gilligan; P.R.O., K. Panting; social secretary, A. Shelley-Fisher. Awards for 1976/7: Member of the Year, Sally Johns; Most Show wins, G. Corum.

The society meet at the **Village Bar**, Garden House, Schooner Inn, Hagley Road, Edgbaston, Birmingham.

FIRST annual open show results of the **Wynnstay A.S.** were as follows: Guppies: 1 and 2, R. O. Connell (Ogram); 3, T. Faux (Merseyside). Mollys: 1, Mr. and Mrs. Tinsley (Sandgrounders) (section winner); 2, R. Hodge (Southport); 3, Mr. and Mrs. Campbell (Macclesfield). Platys: 1, Mr. and Mrs. Muckle (Southport); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Muller (Merseyside). Swords: 1, N. and M. Rimmer (Sandgrounders); 2, Mrs. C. Eason (Sandgrounders); 3, Mr. and Mrs. Houghton (Southport). A.O.V. Livebearers: 1, Mr. and Mrs. J. McCarthy (St. Helens); 2 and 3, Mr. and Mrs. Campbell (Macclesfield). Large Barbs: 1, Mr. and Mrs. Houghton (Southport) (section winner); 2 and 3, Mr. and Mrs. Baldwin (Sandgrounders). Small Barbs: 1, J. T. Morris (Ashton-in-Makerfield); 2, Mr. and Mrs. Underwood (Southport); 3, Mr. and Mrs. Harvey (Atlanta). Large Anabantids: 1, Mr. and Mrs. Cowley (Atlanta); 2, D. and S. Lloyd (Wynnstay); 3, Mr. and Mrs. Campbell (Macclesfield). Small Anabantids: 1, T. Faux (Merseyside) (section winner); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Baldwin (Sandgrounders). Fighters: 1 and 3, Mrs. B. Faux (Merseyside); 2, Mr. and Mrs. Campbell (Macclesfield). Large Characins:

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1, J. T. Morris (Ashton-in-Makerfield); 2, H. Baver (Merseyside); 3, Mr. and Mrs. Baldwin (Sandgrounders). Small Characins: 1, M. Stevenson (Ostram) (section winner); 2, J. T. Morris (Ashton-in-Makerfield); 3, K. Thompson (Merseyside). Corydoras and Bechtold: 1, Mr. and Mrs. Underwood (Southport); 2, Mr. and Mrs. Muckle (Southport); 3, Mr. and Mrs. Houghton (Southport). Loaches: 1, S. Wolstenholme (Heywood); 2, Mr. and Mrs. Muckle (Southport); 3, K. Thompson (Merseyside). A.O.V. Cans: 1, Mr. and Mrs. Gough (Wynnastay) (section winner); 2, Mr. and Mrs. J. McCarthy (St. Helens); 3, Mr. and Mrs. Baldwin (Sandgrounders). Large Cichlids: 1, J. Cobbett (Merseyside); 2, T. Faux (Merseyside); 3, A. Oldham (Wythenshawe). Small Cichlids: 1, S. Stevenson (Ostram); 2, W. Wilde (Merseyside); 3, Mr. and Mrs. Parry (Wrexham). Rift Valley: 1, S. Wolstenholme (Heywood) (section winner); 2, E. M. Stillwell (Sandgrounders); 3, D. and S. Walker (Wrexham). Angels: 1, Mr. and Mrs. Walker (Wrexham); 2, H. Baver (Merseyside); 3, N. Stephenson (Ostram). A.O.V. Tropical: 1, H. Baver (Merseyside); 2, Mr. and Mrs. Gough (Wynnastay); 3, Mr. and Mrs. Cowley (Atlantis). Rainbow: 1, Mr. and Mrs. Muckle (Southport); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Underwood (Southport). Danios: 1, Mr. and Mrs. Hopwood (Wrexham); 2 and 3, Mr. and Mrs. Campbell (Macclesfield). Minnows: 1, Mr. and Mrs. Houghton (Southport) (section winner); 2, Mr. and Mrs. Muckle (Southport); 3, Mr. and Mrs. Hopwood (Wrexham). Ladies A.V.: 1, Mrs. R. Hodge (Southport) (section winner); 2 and 3, Mrs. S. Lloyd (Wynnastay). Labors and Sharks: 1, Mr. and Mrs. S. Baldwin (Sandgrounders) (section winner); 2, Mr. and Mrs. Underwood (Southport); 3, J. Cobbett (Merseyside). Flying Fox: 1, H. Baver (Merseyside); 2, R. Hodge (Southport); 3, P. Reeves (Oldham). Teams Livebearers (1-10): 1, K. Thompson (Merseyside); 2, P. A. Squirrel (Wythenshawe); 3, Mrs. C. Evison (Sandgrounders) (11-20); 1, K. Thompson (Merseyside). Teams Egglayers (1-10): 1, Mrs. C. Evison (Sandgrounders) (section winner); 2, Mr. and Mrs. Tasker (Sandgrounders); 3, Mr. and Mrs. Gough (Wynnastay); (11-20): 1 and 2, P. A. Squirrel (Wythenshawe). Pairs (Livebearers): 1, K. Thompson (Merseyside); 2, Mr. and Mrs. Tinsley (Sandgrounders); 3, Mr. and Mrs. Muckle (Southport). Pairs Egglayers: 1, Mr. and Mrs. Houghton (Southport) (section winner); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. J. McCarthy (St. Helens). A.V. Marine: P. A. Squirrel (section winner). Killies: 1 and 2, Mr. and Mrs. Tasker (Sandgrounders); 3, P. A. Squirrel (Wythenshawe). Mini-Jars: 1 and 2, N. Stephenson (Ostram) (section winner); 3, H. Jones (Wrexham). Common Goldfish: 1, Mr. and Mrs. Baldwin (Sandgrounders). Fancy Goldfish: 1, A. Bibby (Wythenshawe). A.O.V. Coldwater: 1, Mr. and Mrs. Harvey (Atlantis) (section winner); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Mr. and Mrs. Muckle (Southport).

The "Best Fish in Show" award went to Mr. and Mrs. Baldwin of Sandgrounders, with a Shark scoring 79 points.

THE Boston A.S. Open Show results were as follows: Guppies: 1, C. Mangles (Ratford); 2, Mr. and Mrs. Davies (Doncaster); 3, Mrs. Greenwood (Immingham). Mollies: 1, S. Harrison (Grimsby and Cleethorpes); 2, Mrs. Greenwood (Immingham); 3, Mrs. G. Frisby (Hull). Swordtails: 1, A. Piggott (Grimsby and Cleethorpes); 2 and 3, Mr. and Mrs. Roberts (Doncaster). Platies: 1, Masters D. and W. Jordan (South Humberside); 2, Mr. and Mrs. Lake (South Humberside); 3, T. Sands (Boston). A.O.V. Livebearers: 1, W. Blundell (Doncaster); 2, B. Jackson (Doncaster); 3, A. Piggott (Grimsby and Cleethorpes). Small Barbs: 1, D. Harris (Mexborough); 2, Mr. and Mrs. Blades (Bassetlaw); 3, R. Waldron (Peterborough). Large Barbs: 1, Mr. and Mrs. Roberts (Doncaster); 2, Mr. Clay (Queen of the Midlands); 3, D. Harris (Mexborough). Small Characins: 1, A. Piggott (Grimsby and Cleethorpes);

2, J. Harrison (Grimsby and Cleethorpes); 3, Mrs. Greenwood (Immingham). Large Characins: 1, B. Jackson (Doncaster); 2, K. Watson (Workshop); 3, A. Piggott (Grimsby and Cleethorpes). Corydoras: 1 and 2, D. Harris (Mexborough); 3, W. Blundell (Doncaster). A.O.V. Catfish: 1, A. Clayton (Immingham); 2, D. Harris (Mexborough); 3, T. Sanderson (Thorne). Botia and Loach: 1, Mr. and Mrs. Binns (Scunthorpe Museum); 2, T. Sanderson (Thorne); 3, D. Harris (Mexborough). Sharks: 1, A. Piggott (Grimsby and Cleethorpes); 2, Mr. and Mrs. Copley (Doncaster); 3, K. Chapman (Mexborough). Foxes: 1, J. Sanderson (Thorne); 2, W. Hunt (Thorne); 3, T. Sands (Boston). Dwarf Cichlids: 1 and 3, Mrs. Bee and Family (Grimsby and Cleethorpes); 2, Masters D. and W. Jordan (South Humberside). Large Cichlids: 1, Mrs. Bee and Family (Grimsby and Cleethorpes); 2, B. and R. Kay (Boston); 3, Mrs. Almond (Independent). Angels: 1, G. J. Sibson (Workshop); 2, Mr. and Mrs. Mangles (Ratford); 3, A. Freeman (Kings Lynn). Rift Valley Cichlids: 1, Mr. Laws (Kings Lynn); 2, Mr. and Mrs. Caldwell (Scunthorpe Museum); 3, Mr. and Mrs. Laker (South Humberside). Fighters: 1 and 2, R. Turner (Thorne); 3, Mrs. Bee and Family (Grimsby and Cleethorpes). Small Anabantids: 1, Mrs. Bee and Family (Grimsby and Cleethorpes); 2, S. Harrison (Grimsby and Cleethorpes); 3, T. Tidwell (Grimsby and Cleethorpes). A.O.V. Anabantids: 1, W. Blundell (Doncaster); 2, T. Tidwell (Grimsby and Cleethorpes); 3, Mrs. Bee and Family (Grimsby and Cleethorpes). Minnows and Danios: 1, A. Piggott (Grimsby and Cleethorpes); 2, J. Harrison (Grimsby and Cleethorpes); 3, D. Harris (Mexborough). Rainbow: 1, D. Harris (Mexborough); 2, A. Piggott (Grimsby and Cleethorpes); 3, Masters D. and W. Jordan (South Humberside). Toothcarps: 1, A. Clayton (Immingham); 2, Mr. and Mrs. Blades (Bassetlaw); 3, B. Banks (Thorne). A.O.V. Tropical: 1, Mr. and Mrs. Caldwell (Scunthorpe Museum); 2, A. Frisby (Hull); 3, T. Sanderson (Thorne). Be Egglayers 1-10: 1 and 2, B. Banks (Thorne). Be Egglayers 11-20: 1, A. Piggott (Grimsby and Cleethorpes); 2, B. Banks (Thorne); 3, L. Waller (Rotherham). Breeders Livebearers 1-10: 1, Mr. and Mrs. Roberts (Doncaster); 2 and 3, S. Tilling (Immingham). Pairs Egglayers: 1, Mr. and Mrs. Lake (South Humberside); 2, Mrs. Greenwood (Immingham); 3, A. Woodthorpe (Boston). Pairs Livebearers: 1 and 3, K. Prendergast (Boston); 2, W. Blundell (Doncaster). Goldfish and Guppies: 1 and 2, L. Waller (Rotherham); 3, K. Chapman (Mexborough). Shubunkins and Fancy Goldfish: 1, Mr. and Mrs. Blades (Bassetlaw); 2, H. Carter (Independent); 3, Mr. Alan (Independent). A.O.V. Coldwater: 1, Masters D. and W. Jordan (South Humberside); 2, M. Brakes (Peterborough); 3, T. Sands (Boston). A.V. Fern Egglayer: 1, Mr. and Mrs. Blades (Bassetlaw); 2, A. Clayton (Immingham); 3, A. Proby (Hull). A.V. Fern Livebearer: 1, K. Prendergast (Boston); 2, T. Sands (Boston); 3, Mr. Tilling (Immingham). Jnr. Egglayer: 1, B. Banks (Thorne); 2, M. Lake (South Humberside); 3, M. Turner (Thorne). Jnr. Livebearer: 1, S. Sand (Boston); 2, Masters D. and W. Jordan (South Humberside); 3, S. Tilling (Immingham). Plants: 1 and 3, Mr. and Mrs. Roberts (Doncaster); 2, K. Prendergast (Boston). Mini Tank: 1, K. Prendergast (Boston).

RECENTLY members of Longridge and District A.S. greatly appreciated the demonstration of how to build show tanks by Society Chairman, Mr. J. Marsh, at their June meeting. The demonstration also prompted a lively discussion on the best way of carrying fish to shows.

The numbers in the Table Show were down on previous months as one or two of the regular exhibitors were unable to attend and this left the way wide open for Mr. and Mrs. Ray Holden to consolidate their lead at the top of the Society's Show League Table, by winning five of the six classes and Best in Show. Results: Dwarf Cichlids: 1, Mr. and Mrs. Holden. Large Cichlids: 1, Mr. and Mrs. B. Durham; 2, Mr. and Mrs. Holden. Angels: 1, Mr. and Mrs.

Holden; 2, Mr. and Mrs. Durham. Rift Valley: 1 and 2, Mr. and Mrs. Holden. A.O.V. Egglayer: 1, 2 and 3, Mr. and Mrs. Holden. A.V. Livebearer: 1, Mr. and Mrs. Holden; 2 and 3, Mr. and Mrs. Durham. Best in Show: Mr. and Mrs. Holden. Siamese Fighting Fish: Top places in the Society Show League see: 1, Mr. and Mrs. Holden 82 pts.; 2, Mr. and Mrs. Durham 57 pts.; 3, J. Marsh 28 pts.; 4, N. Bland 12 pts.; 5, Mr. and Mrs. Lyons 8 pts.

MEMBERS at the June meeting of the King's Lynn A.S. were given a very entertaining talk by Mr. D. B. Littlefield of Honeysome Aquatic Nursery on all aspects of pond building ending in a question and answer time.

The bench show for coldwater fish was won by Mr. M. Laws.

The Club's first Exhibition held in May was also a great success with many varieties of fish on display.

Anyone interested in fish is very welcome to come along to meetings held 8 p.m., second Thursday of each month at North Star P.H., North Lynn, or contact Mrs. S. George, KL 671610 for further details.

THE David Brown A.S. held its first annual general meeting in May, when the secretary reported that since the forming of the society in May, 1976, membership had built up to 50 and that although most of the members were reasonably new to fishkeeping, they were well on the way to becoming a well-established society.

The retiring officials were duly thanked by the secretary for the hard work that they had put into the society. They were E. Walters (chairman), D. Jarrell (treasurer), and L. Hardy (show secretary vice-treasurer). Those elected to serve for the next twelve months were: Hon. president, P. Mosehouse; chairman, Mrs. J. Hardy; secretary, A. G. Copp; treasurer, S. H. Moorhouse; show secretary vice-treasurer, J. Sykes; assistant secretary, S. Price. Committee members: Mrs. D. Price, Mrs. J. C. Copp, L. Hardy and B. Schindler.

THERE were 533 entries from twenty-one societies for the St. Helen's A.S. open show in June. Results: Guppies: 1, T. Faux (Merseyside); 2, J. Riley (Castleford); 3, Mr. and Mrs. Baldwin (Sandgrounders). Platies: 1, D. Ridyard (Leigh); 2, B. W. Carter (St. Helens); 3, K. Thompson (Merseyside). Swordtails: 1, B. W. Carter (St. Helens); 2, D. Algie (St. Helens); 3, Mr. and Mrs. Houghton (Southport). Mollies: 1, Mr. and Mrs. Tinsley (Sandgrounders); 2, D. Algie (St. Helens); 3, Mr. and Mrs. Riley (Castleford). A.O.V. Livebearers: 1, Mr. and Mrs. Petty (Castleford); 2, Mr. and Mrs. Durham (Longridge); 3, Mr. and Mrs. Campbell (Macclesfield). Small Anabantids: 1, J. McCarthy (St. Helens); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, K. Thompson (Merseyside). Large Anabantids: 1, J. McCarthy (St. Helens); 2, Mr. and Mrs. Lyons (Longridge); 3, L. and D. J. Thorn (Northwich). Fighters: 1, B. Faux (Merseyside); 2, W. Chapman (Bridgewater); 3, Mr. and Mrs. Campbell (Macclesfield). Small Barbs: 1, B. W. Carter (St. Helens); 2, J. T. Morris (Ashton-in-Makerfield); 3, N. Stephenson (Ostram). Large Barbs: 1 and 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Mr. and Mrs. Houghton (Southport). Dwarf Cichlids: 1, B. Parr (Hyde); 2, B. Wilson (Sandgrounders); 3, M. and Mr. Riley (Castleford). Large Cichlids: 1, J. Faux (Merseyside); 2, Mr. and Mrs. Aspinall (Southport); 3, Mr. and Mrs. Underwood (Southport). Rift Valley Cichlids: 1, B. Wilson (Sandgrounders); 2 and 3, Mrs. E. Stillwell (Sandgrounders). Angels: 1, Mr. and Mrs. Muckle (Southport); 2, Mr. and Mrs. A. Lyons (Longridge); 3, N. Stephenson (Ostram). Small Characins: 1, Mr. and Mrs. Goddard (Macclesfield); 2, N. Stephenson (Ostram); 3, J. T. Morris (Ashton-in-Makerfield). Large Characins: 1 and 2, Mr. and Mrs. Houghton (Southport); 3, N. Stephenson (Ostram). Toothcarps: 1 and 2, K. Thompson (Merseyside); 3, J. Noon (Leigh). Danios: 1, N. and M. Rimmer (Sandgrounders);

2, Mr. and Mrs. Lyons (Longridge); 3, 1. McCarthy (St. Helena). Minnows: 1, Mr. and Mrs. Houghton (Southport); 2, Mr. and Mrs. Muckle (Southport); 3, J. Dean (St. Helena). Rasbora: 1, W. Brown (Warrington); 2, Mr. and Mrs. Muckle (Southport); 3, R. Wilson (Skelmersdale). Corydoras and Brochis: 1, B. W. Carter (St. Helena); 2, Mr. and Mrs. Riley (Castleford); 3, Mr. and Mrs. Taylor (Atlanta). A.O.V. Catfish: 1, K. Thompson (Merseyside); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, J. McCarthy (St. Helena). Sharks: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, T. Paux (Merseyside); 3, L. J. Campbell (Vale Royal). Flying Foxes: 1 and 2, Mr. and Mrs. Hodges (Southport); 3, B. W. Carter (St. Helena). Loaches: 1, K. Arnold (Bridgewater); 2, Mr. and Mrs. Hodges (Southport); 3, M. Collins (St. Helena). A.O.V.: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Cowley (Atlanta); 3, Mr. and Mrs. Tinsley (Sandgrounders). Pairs Egg-layers (under 3 in.): 1 and 2, B. W. Carter (St. Helena); 3, N. Stephenson (Ostram). Pairs Egg-layers (over 3 in.): 1, W. Edwards (Bridgewater); 2, E. Jones (Leigh); 3, J. McCarthy (St. Helena). Pairs Livebearers: 1, M. Lawson (St. Helena); 2, Mr. and Mrs. Aspinall (Southport); 3, Mrs. E. Stillwell (Sandgrounders). Breeders Livebearers (1-10): 1, Mr. and Mrs. Godard (Macclesfield); 2, P. A. Squirrel (Wythenshawe); 3, C. Iverson (Sandgrounders). Breeders Livebearers (11-20): 1, 2 and 3, K. Thompson (Merseyside). Breeders, Egg-layers (1-10): 1, C. Iverson (Sandgrounders); 2, B. Paux (Merseyside); 3, Mr. and Mrs. Tasker (Sandgrounders). Breeders, Egg-layers (11-20): 1, Mr. and Mrs. Petty (Castleford); 2, E. Jones (Leigh); 3, Mr. and Mrs. Tasker (Sandgrounders). Common Goldfish: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2 and 3, T. Unsworth (St. Helena). Fancy Goldfish: 1 and 3, Mr. and Mrs. Tasker (Sandgrounders); 2, T. Unsworth (St. Helena). A.O.V. Goldwater: 1, Mr. and Mrs. Harvey (Atlanta); 2, Mr. and Mrs. Riley (Castleford); 3, Mr. and Mrs. Houghton (Southport). Marine A.V.: 1, 2 and 3, P. Caulfield (Skelmersdale). Ladies A.V.: 1, Mrs. Baldwin (Sandgrounders); 2, Mrs. Collins (St. Helena); 3, Mrs. Stillwell (Sandgrounders). Junior Egg-layers: 1, A. Hopwood (Blackburn); 2, A. Sutton (Atlanta); 3, D. and S. Taylor (Atlanta). Junior Livebearers: 1, L. Groves (Sandgrounders); 2, Miss J. Baldwin (Sandgrounders); 3, Miss A. Petty (Castleford). Mini-Jars: 1, 2 and 3, N. Stephenson (Ostram).

The Best Fish in Show award went to K. Thompson of Merseyside Society, with a *Microglanis* Catfish.

OWING to the change of venue of the **Bexleyheath and District A.S.**, only one meeting was held in April. The Table Shows were for: A.O.S. Catfish and A.V. Corydoras. Results as follows: A.O.S. Catfish: 1, G. Greenhalf; 2 and 4, R. Yeeley; 3, Mrs. A. Greenhalf. Novice A.O.S. Catfish: 1 and 2, H. Johnson; 3 and 4, N. Raven. A.V. Corydoras: 1 and 2, Mrs. A. Greenhalf; 3, H. Johnson; 4, W. Woodward. Novice Corydoras: 1 and 3, H. Johnson; 2 and 4, N. Raven.

An interesting and informative slide lecture was given by Derek Lambourn on Catfish. Also in April the society visited N. Kent for an inter-club match which the visitors won by 52-48 points.

DESPITE the local water difficulties and counter attractions the **Southend, Leigh and District A.S.** Open Show as well supported with 680 entries. Results: Club Furnished: 1, S. Spicer (Sladas). Miniature Aquaria: 1, Mr. Hard (Brighton); 2, T. Waller (Elapa); 3, G. Pryor (Sladas); 4, S. Spicer (Sladas). Individual Aquascapers: 1, D. Durrant (Sladas); 2 and 3, S. Spicer (Sladas). Barbs: 1 and 4, P. Moye (Sudbury); 2, B. Sayers (Brighton); 3, R. Neale (Sladas). Barbs: 1, A. Chandler (Walthamston); 2, R. Davis (Sladas); 3, E. Mifusd (Dunmow); 4, P. J. Doe (Ilford). Characins: 1, C. and D. Finnis (Strood); 2, R. F. Thoday (Elapa); 3, K. Dryden (Croydon); 4, B. Harford (Saracens). Characins:

1, A. E. Noronha (Orpington); 2, R. F. Thoday (Elapa); 3, P. Moye (Sudbury); 4, R. Fountain (Chingford). Percis: 1, G. Pryor (Sladas); 2, P. Rushbrooke (Reading); 3 and 4, T. Wooley (Saracens). Cichlids: 1, May Netherell (Riverside); 2, T. Scuter (Independent); 3, T. Ramshaw (Brighton); 4, E. Mifusd (Dunmow). Angels: 1, K. J. Wylie (Sladas); 2, C. and D. Finnis (Strood); 3, Mr. Hard (Brighton); 4, Mr. and Mrs. Cooper (Corringham). Dwarf Cichlids: 1, 2, 3 and 4, R. C. Smith (Corringham). Cichlids (Malawi, Nyasa, etc.): 1, 2 and 4, R. F. Thoday (Elapa); 3, T. Johnson (Folkestone). Labryntina: 1, S. Broome (Reading); 2, Mrs. D. Ragger (Canfith); 3, A. Chandler (Walthamston); 4, P. Moye (Sudbury). Fighters: 1, P. Moye (Sudbury); 2, D. North (Corringham); 3, A. Bradnam (Tonbridge); 4, T. Ramshaw (Brighton). Gouramies: 1 and 3, C. and D. Finnis (Strood); 2 and 4, B. Meech (Elapa). Killies: 1, R. Roberts (B.K.A.); 2, L. Emaden (B.K.A.); 3, S. Jordan (Independent); 4, R. F. Thoday (Elapa). Catfish: 1, S. Hunt (Dunmow); 2, May Netherell (Riverside); 3, T. Wooley (Saracens); 4, R. F. Thoday (Elapa). Corydoras, Brochis: 1, P. Moye (Sudbury); 2, P. Rushbrooke (Reading); 3, May Netherell (Riverside); 4, B. Nichols (Mid-Kent). Rasbora: 1, D. Winder (East Dulwich); 2, D. Durrant (Sladas); 3, R. F. Thoday (Elapa); 4, T. Ramshaw (Brighton). Danios and White Clouds: 1, S. Hunt (Dunmow); 2, B. Nichols (Mid-Kent); 3, M. Collins (Brighton); 4, R. Davis (Sladas). Loaches: 1 and 2, R. F. Thoday (Elapa); 3 and 4, D. Winder (East Dulwich). A.O.S. Egg-layers: 1, R. J. Wylie (Sladas); 2, May Netherell (Riverside); 3, G. Pryor (Sladas); 4, T. Ramshaw (Brighton). Pairs Egg-layers: 1 and 4, R. Roberts (B.K.A.); 2 and 3, D. Cheswright (Sladas). Pairs Livebearers: 1, 2 and 4, A. E. Noronha (Orpington); 3, D. Cheswright (Sladas). Male Guppies: 1, D. North (Corringham); 2 and 4, A. E. Noronha (Orpington); 3, T. Wooley (Saracens). Female Guppies: 1, D. North (Corringham); 2, S. Spicer (Sladas); 3, B. Reynolds (Romford); 4, Mrs. Wood (Cladas). Swordtails: 1 and 2, A. E. Noronha (Orpington); 3 and 4, R. C. Smith (Corringham). Platies: 1, C. and D. Finnis (Strood); 2, B. Sayers (Brighton); 3, D. Chappell (Strood); 4, Mrs. L. Faulks (Sladas). Mollies: 1 and 2, J. Smith (Brighton); 3, C. and D. Finnis (Strood); 4, M. Shelton (Elapa). A.O.S. Livebearers: 1, K. Dryden (Croydon); 2 and 4, A. E. Noronha (Orpington); 3, D. Cheswright (Sladas). Single Tail Goldfish: 1, D. Cheswright (Sladas); 2, T. Wooley (Saracens); 3, D. Durrant (Sladas); 4, K. Dryden (Croydon). Twin Tail Goldfish: 1, T. J. Asquith (Selas); 2, 3 and 4, L. Selwood (Diss). A.O.S. Coldwater: 1, Mr. Hard (Brighton); 2, 3 and 4, B. Harford (Saracens). Koi, Carp, etc.: 1, D. Cheswright (Sladas); 2 and 3, Mrs. F. Perry. Breeders (Egg-layers): 1 and 3, R. F. Thoday (Elapa); 2 and 4, T. Johnson (Folkestone). Breeders, Livebearers: 1 and 2, P. Huckle (Hatfield); 3, C. and D. Finnis (Strood); 4, A. E. Noronha (Orpington). Breeders (A.O.S. Livebearers): 1, K. Dryden (Croydon); 2, 3 and 4, A. E. Noronha (Orpington). Marines: 1, C. Brakes (Peterborough); 2, D. Durrant (Pleurocetes). Cuttings and Floating Plants: 1, T. Waller (Elapa); 2, D. Durrant (Sladas); 3 and 4, W. Woodward (Bexleyheath). Rooted Plants: 1, R. J. Wylie (Sladas); 2, D. Valverde (Chingford); 3, P. Rushbrooke (Reading); 4, D. Cheswright (Sladas). Junior A.S. Egg-layers: 1 and 2, R. Wooley (Saracens); 3 and 4, J. Dryden (Croydon). Junior A.S. Livebearers: 1 and 2, R. Wooley (Saracens); 3, S. Spicer (Sladas); 4, C. Hooper (Brighton). Junior A.S. Coldwater: 1, R. Smith (Bexleyheath); 2 and 4, P. Bree (Bexleyheath); 3, S. Spicer (Sladas). Best Characin: A. E. Noronha (Orpington). H. Serpae. Best Goldwater: D. Cheswright (Sladas). Goldfish. Best Catfish: S. Hunt (Dunmow). P. Nigrolinestus. Best Cichlid: R. F. Thoday (Elapa). M. Auratus. Best Livebearer: C. and D. Finnis (Strood). V. Platy. Best Junior: R. C. Smith (Bexleyheath). Club Championship: Elapa. High Pointed Exhibitor: A. E. Noronha. Highest Pointed Sladas Exhibitor: S. Spicer. Silver Jubilee

Trophy: R. F. Thoday. Best Fish in Show: S. Hunt (Dunmow). P. Nigrolinestus.

NEW SOCIETY

ON the 18th May an initial meeting of nine interested persons desirous of forming an Aquatic Study Society was held at "The Three Horseshoes," Leamside, County Durham. Also attending were representatives from Northumbria A.S., Houghton A.S. and South Shields A.S. A further meeting was held on 1st June and the following committee was elected. Chairman: P. Jordan; Acting Secretary: R. Riley; Assistant Secretary: Mrs. C. Wilkinson; Treasurer: P. Jordan, Jr. Following the election of officers, C. Entwright of South Shields gave the nine members a slide and talk on Cichlids. The society which has yet to decide on a name, welcome new members in the Durham City area, meeting every Wednesday fortnight at 8 p.m., commencing 1st June, at "The Three Horseshoes," Leamside. For further information please contact the Acting Secretaries, Mr. R. Riley, Houghton-le-Spring 642090 or Mrs. C. Wilkinson, Durham 720 9272 642.

ADDRESS REQUIRED

WOULD Mr. A. Vassaire, one-time member of the **Merseyside A.S.**, please contact the Show Secretary of the **Swillington A.S.** as this society do not have any particulars and would like to get in touch. D. and P. Birdsell, Show Secretaries, Swillington A.S., 6 Burley Wood Lane, Leeds LS4 2SU, Yorkshire.

VENUE CHANGE

The **Bexleyheath and District A.S.** now meets at the Committee Room, A.B.C. Bowl, Broadway, Bexleyheath, Kent.

SHOW DATE CHANGE

The date of the **Blackburn Aquarist Waterlife Society** Open Show has been changed to the 2nd October at King Georges Hall, Northgate, Blackburn.

SHOW CANCELLATIONS

The **Mid-Cornwall A.S.** Open Show scheduled for 11th September at Falmouth has been cancelled due to lack of support.

Through unforeseen circumstances it is no longer possible for the C.N.A.A. to hold a "Welsh National Open Show and Exhibition" this year.

AQUARIST CALENDAR

- 7th August:** Tonbridge and District A.S. Open Show Schedules available from J. Feast, 19 Bardley Road, Sevenoaks, Kent TN13 1XX.
- 7th August:** Koi East Anglia Open Show, Waveney Fish Farm, Diss, Norfolk. Viewing from 1.30 p.m. Further details from G. Wright, 98 Lower Cliff Road, Goleston-on-Sea. Tel: 0493-68440.
- 14th August:** Yorkshire Koi Society First National Open Show, Wayside Water Gardens, Oldcotes, near Doncaster. Information and show schedules from F. J. Ayres, 35 Manor Drive, Hilton, Yarm, Cleveland. Telephone: 0642 591717.
- 14th August:** Midland Association of Aquarists Societies, Open Show at the Nicholas Chamberlain School, Bulkington Road, Bedworth. Full Classes. Details and schedules from Show Secretary, S. Whitehouse, 68 Oaken Park, Cobbold, Wolverhampton, Staffs.
- 14th August:** Oldham A.S. Open Show at Wernith Park, Oldham. Information and show schedules can be obtained from A. Chadwick, 341 Broadway, Chadderton, Oldham. Tel: 061- 52 0800.
- 14th August:** Grimsby and Cleethorpes A.S. Sixth Open Show at the Memorial Hall, Cleethorpes. Benching from 12 noon to 2 p.m. Details and show schedules available from the Show Secretary, L. Curran, 4 Swaby Drive, Cleethorpes, South Humberside DN35 9PB.
- 14th August:** Blackpool & Fylde A.S. Open Show will be held at the Blackpool Boys Club, Laycock Gate, off Devonshire Road, Blackpool (same venue as last year). Schedules from Miss K. C. Smith, 14 Newton Dr., Blackpool.
- 20th-21st August:** Third Yorkshire Aquarist

Festival at Doncaster Racecourse. Show Secretary, Mr. B. D. Chester, 7 Rose Lea, Ordsall, Retford, Notts.

20th-21st August: Yorkshire Aquarist Festival to be held at Doncaster Racecourse. Details from B. D. Chester 7 Rose Lea, Ordsall, Retford, Notts.

21st August: Stratford and District A.S. Open Show at Butle Hill High School, Eccles Old Road, Salford. Details from J. Brown, 18 Royton Court, 72-74 Carlton Road, Manchester 16.

21st August: Stroud and District A.S. Annual Open Show at the Subscription Rooms, Stroud. Full tropical classes plus twelve classes for Coldwater. Schedules later from Mr. J. Cole, 13, The Hill, Randwick, Stroud, Glos. 4504.

21st August: Macclesfield A.S. Open Show, Central Park School, Rydes Park Road, Macclesfield, Cheshire.

21st August: B.K.A. Severnside Group, Annual Killifish Show (Incorporated in the Stroud A.S. Open Show). Seven classes, awards for each class. Subscription rooms, George St. Stroud. Schedules later from Mr. J. Cole, 13, The Hill, Randwick, Stroud, Glos. GL6 6JH.

27th-28th August: The Irish Tropical Societies Annual Open Show at the Oblate Hall, Inchicore, Dublin 9. 32 Classes. Schedules from Sean Mooney, 1 Carrick Hill Road, Portmarnock, Co. Dublin. Phone 01-451908.

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

28th August: Long Eaton A.S. Open Show at Gregory's Rose Gardens, Toton, Nottingham. Send s.a.c. for Schedule to: Mr. R. Smullen, 9 Festival Avenue, Breaston, Derby, DE7 3DH.

28th-29th August: Gt. Yarmouth and District A.S. Tropical and Cold water Fish to be held at Hapton New Village Hall (on A12 between Gt. Yarmouth and Lowestoft).

28th August: Northern Goldfish P.S. First Show at St. James Church Hall, Bolton.

28th August: Schedules and entry forms for the Northern Goldfish and P. n. keepers Society first open show at Bolton, Lancs., are available from Mr. W. Ramsden (Assistant Show Secretary) 18, Ainsdale Road, Bolton.

29th August (Bank Holiday): Southport A.S. Open Show at "The Oak Leaf Hall" British Legion Club, Whitehouse Lane, Formby, Nr. Southport.

3rd September: Plymouth A.S. are holding their Open Show at Trinity United Reform Church Hall, Tor Lane, Hartly, Plymouth. Show schedules may be obtained from Show Secretary, J. Randle, 50 Durham Avenue, St. Jude's, Plymouth, Devon.

4th September: Castleford A.S. Open Show at the Civic Centre, Castleford. Schedules and information can be obtained from show secretary, F. Holmes, 48 Ilmece Road, Ferry Fryston, Castleford, Yorks. Tel: Castleford 559485.

4th September: Bridgewater A.S. Second Open Show will be held at St. Georges Community Centre. Details from Show Secretary, D. Hilton, 31 Portland Road, Worsley. Tel: 061-790 8106.

4th September: Wellingborough Open Show (F.B.A.S.). Venue: Weavers Sport Centre, Show Secretary, A. J. Crew, 67 Swinburne Road, Wellingborough, Northants. Tel: Wellingborough 77131.

4th September: Hoylake A.S. Open Show. Venue to be announced later. Secretary, G. Robinson, 24 Heathmoor Road, Meerton, Wirral, Merseyside L46 7UN.

4th September: Bethnal Green A.S. Open Show, to be held at The Bethnal Green Institute, 229 Bethnal Green Road, E.2. F.B.A.S. Championship class "K" (Danios & W.C.M.M.).

Schedules and further details available from the Show Secretary, Mr. R. Dale, 14 Rutland Road, Wainstead E11 2DY. Tel: 01-989 9015.

4th September: Hoylake A.S. 1988 Open Show at Y.M.C.A. Hall, Hoylake. Further information from J. Sanders, 18 Drake Road, Leasowe, Wirral. Tel: 051-630 1171.

10th September: Hounslow and District A.S. Annual Open Show to be held at the Youth Centre, Cecil Road, Hounslow, Middlesex.

10th September: Kingston and District A.S. Open Show at The Sutton Adult School and Institute, Barnhill Avenue, Sutton, Surrey. Schedules Mr. E. Lough, 315 Ewell Road, Tolworth Surrey.

11th September: Harlow A.S. Open Show at Moor Hall, The Stow, Harlow.

11th September: Cleveland A.S. Open Show. F.B.A.S. Rules. James Finnigan Hall, Fabian Road, Eton, Cleveland. Plenty of parking space and large hall. Details: Mr. D. Lackman, 19 Ryhill Walk, Overfields, Middlesbrough, Cleveland TS7 9JL. (Phone: M'Bro. 312476).

11th September: Longridge and District A.S. first Open Show at Longridge Civic Hall, Willows Park Lane, Longridge, Preston, Lancs. (15 minutes from the M6). Schedules available from B. Durham, 12 Birchfield Drive, Longridge, Preston, Lancs. PR3 3HP.

17th September: Bristol A.S. Open Coldwater Show at Bishopston Parish Hall, Gloucester Road. Schedules from Show Secretary, E. N. Bowden, 15 Inns Court Green, Beinstol BS4 1TX.

18th September: Priory A.S. Open Show Schedules from W. J. Walton, 25 Rutherford Street, High Haddon, Wallasey, Tyne and Wear, NE28 0AW.

18th September: Whitby and District A.S. Annual Open Show at the Spar Pavilion, Whitby. More details at a later date.

18th September: Barnsley Tropical Fish Society Open Show, Mappletwell and Staincross Village Hall, Darton Lane, Mappletwell, nr. Barnsley. Further details from T. Busfield, 31 Coniston Road, Barnsley S71 1EL.

18th September: West Cumberland A.C. Open Show Venue: The Calder Club, Mirehouse, Whitehaven, Cumbria.

18th September: Hastings and St. Leonards A.S. Open Show. Schedules from: Mr. C. Parsell, 148 Lansley Drive, Hastings, East Sussex TN34 2BY.

18th September: Wythenshawe and District A.S. Third Annual Open Show to be held at the Forum, Civic Centre, Wythenshawe, Manchester. Details available from Show Secretary, D. Carr, 7 Penarth Road, Manchester 22.

20th September: Aireborough and District A.S. Autumn Mini Show at Greenacres Hall, New Road Side, Rawdon, Nr. Leeds. Schedules from G. E. Cuff, 31 Oakdale Drive, Bradford, W. Yorks. BD10 0JF. Tel: Bradford 632424.

25th September: Atlantis Fishkeeping Society First Open Show at the Aintree Institute, Black Bull, Aintree, Liverpool. Schedules will be available later.

25th September: Chesterfield and District A.S. Annual Open Show will be held at Clay Cross Social Centre.

25th September: The Wyre Forest A.S. is to hold its first Open Show at the Middleman Restaurant, Bridge Street, Stourport-on-Severn, Worcestershire. Further details and schedules can be obtained from the Show Secretary, C. Baskerville, 201 Collis Street, Southbridge, West Midlands DY8 4HH.

1st October: The Ichiban Rancho Society National Rancho Open Show, Seymour Hall, Seymour Place, Westminster, S.A.E. for schedule to Mr. F. Hilton, 5 Woodmers Mead, Pleshey (Show Secretary) or ring for details Bishops Cleeveford 870395. There will be six classes, with Engraved cups for 1st, 2nd and 3rd, plus Award Cards and Specials.

2nd October: Eboracum A.S. Open Show at Nouthoep Grammar School, Scarceod Road, York. Bunching 10 a.m.-2 p.m.

2nd October: David Brown A.S. First Open Show, to be held at Paddock Village Hall Church Street, Paddock, Nr. Huddersfield. There will be 32 classes, in 12 sections. For further details send S.A.E. to A. G. Copp, 41 Keldregate, Bradley, Huddersfield, West Yorkshire.

2nd October: Ealing and District A.S. Open Show. Venue to be announced.

2nd October: Newbury and District A.S. Open Show to be held at the Corn Exchange, Newbury, Berkshire. Show Secretary, Mrs. Shirley Canning, 6 South End, Gold Ash, Newbury, Berkshire. Tel: Thatcham (0455) 64254.

8th October: Goldfish Society Great Britain Open Show is to be held at Raynes Park, Wimbledon. Show schedules available from Mr. G. Herring, 94 Penwith Road, London S.W.18.

9th October: A.A. Jones and Shipman Aquarist and Pond Society's Second Open Show. Sp entry, trade stands, exhibitors etc. Schedules will be available from M. D. Hrambridge, c/o A.A. Jones and Shipman Ltd., Narborough Road South, Leicester in July.

9th October: Hartlepool A.S. Open Show: Longuar Hall, Seaton Carew, Hartlepool. Details from Show Secretary, A. Wear, 30 Wharfedale, Hartlepool.

9th October: Morecambe Bay A.S. Open Show, to be held at the Lower Ashton Hall, Town Hall, Lancaster.

15th October: East London Aquarist & Pond-keepers Association Annual Open Breeders Show, at Ripple Road School, Ripple Road, Barking, Essex. Schedules available from T. Waller, 1 Sparshot Road, Barking, Essex.

18th October: North Wilts A.S. First Open Show to be held at the Mechanic's Institute, Emlyn Square, Swindon, Wilts. Schedules from Q. Curtis, 80 Beech Avenue, Pinehurst, Swindon Wilts. Tel: Swindon 32920.

22nd-23rd October: British Aquarists Festival Belle Vue Zoological Gardens, Manchester. Further details shortly.

23rd October: Torbay A.S. Open Show at the Torbay Club, Honol, Marldon, Paignton. Details from J. Davis, 23 Haldon Road, Torquay.

23rd October: Huddersfield T.F.S.

23rd October: Chelmsford A.S. Open Show at the Community Centre, Broomfield, Chelmsford. Details from Show Secretary, J. I. Munro, 1 Gerson Close, Broomfield, Chelmsford. Would winners of the cups from the October 1975 show please contact the above with a view to returning same as soon as possible.

30th October: Doncaster and District A.S. Open Show at Carcroft Welfare Hall, Carcroft Avenue, Carcroft, Nr. Doncaster, Yorks. Details from Show Secretary, Mr. K. Lancashire, 20 Symes Gardens, Cantley, Doncaster.

6th November: Halifax A.S. Open Show at the Forest Cottage Community Centre Cousin Lane, Hingworth, Halifax. Schedules sent only on request. S.A.E. to: D. Shields "Cobblestones" Gaiwest, King Cross, Halifax, HX2 7DT, or Ring for details Halifax. 60116.

6th November: Blackburn Aquarist Waterlily Society Open Show. Venue at a later date. Secretary, Mrs. Jean Wolstenholme, 39 George Street, Great Harwood, nr. Blackburn BB6 7JE.

13th November: Bradford and District A.S. Open Show at Tuxide Hall, Westgate, Bradford. Details are available from the show secretary, J. Cornforth, 15 Weymouth Avenue, Alerton, Bradford. Telephone: Bradford 493165.

19th November: Goldfish Society of Great Britain, General Meeting, 2.30 p.m., Small Hall, Conway Hall, Red Lion Square, Holborn, London, WC2.

20th November: Northallerton and District A.S. first Open Show to be held at the Community Centre, Northallerton. Schedules available later.