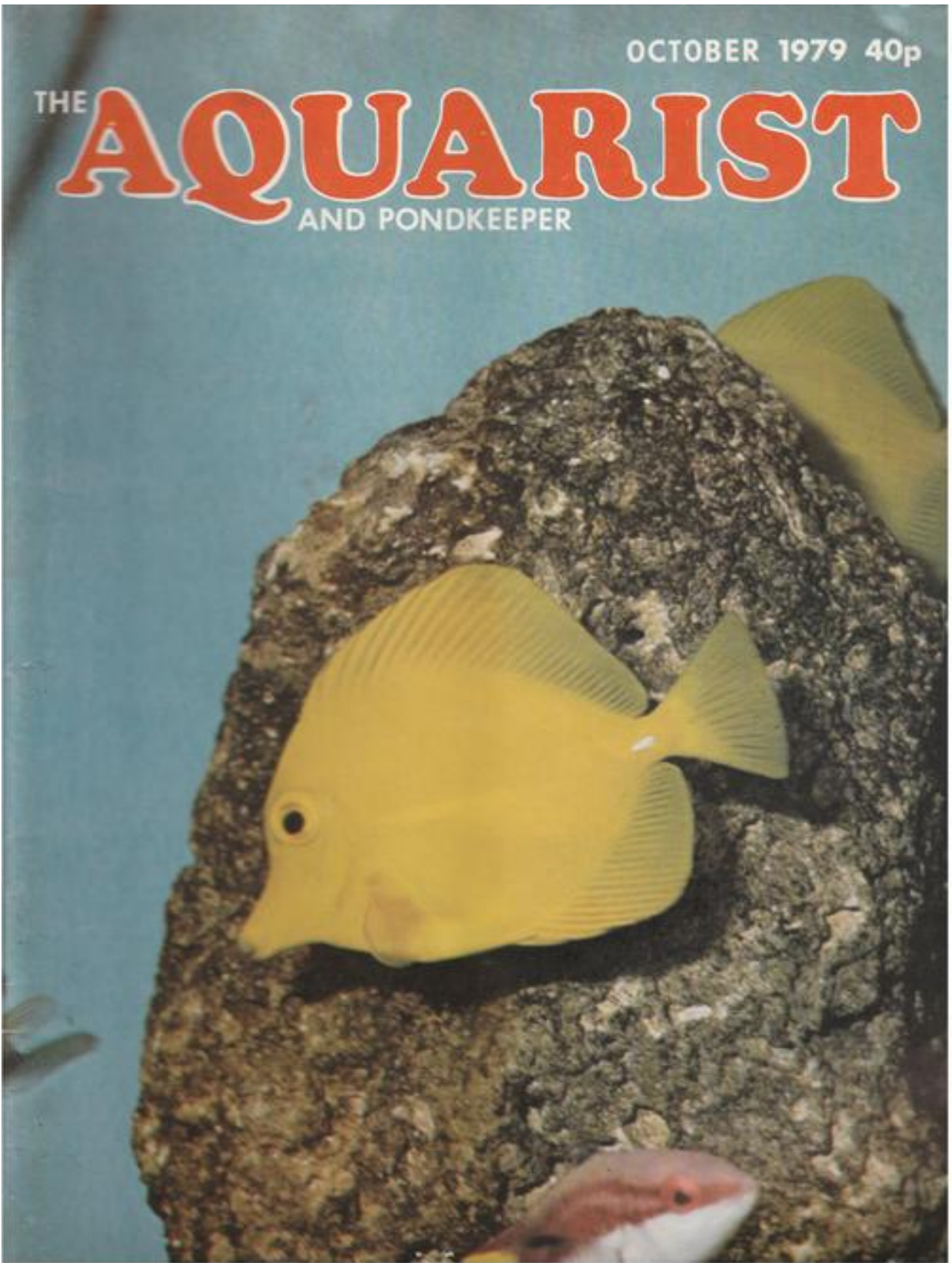


OCTOBER 1979 40p

THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

Published Monthly 40p

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

Subscriptions: Rate
The Aquarist will be sent by
post for one year to any address
for £6.50. Airmail quoted on
request.

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

Founded 1924
as "The Amateur Aquarist"
Vol. XLIV No. 7, 1979

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

Our Cover:
Yellow Tang
(*Zebrafish flavescens*)

October, 1979

Contents

	PAGE
Our Experts answer: Tropical Queries	24
Coldwater Queries	27
Koi Queries	30
Marine Queries	32
Commentary	34
Readers' Letters	35
Coldwater Jottings	38
Looking at Sticklebacks	40
From a Naturalist's Notebook	46
The Yorkshire Aquatic Festival 1979	48
Meadowsweets for Poolside Planting	49
What is Your Opinion?	50
The Garden Pond in Autumn	56
<i>Astroblepidae</i> —with eyes pointing to the stars	58
<i>Ancistrus dolichoptera</i>	61
Book Review	63
News from Societies	64

The Editor accepts no responsibility for views expressed by contributors.



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

I have some silver tips or hasemanias. Are they all right in a community tank?

The silver tip is quite at home in a community tank stocked with other smallish species. It thrives best at a temperature in the middle to upper seventies (°F) and is best accommodated in neutral to slightly acid water.



Hypessobrycon flammeus

Can you suggest a good shoaling fish to go with neon tetras and featherfin tetras in a 48 in. x 15 in. x 12 in. tank strongly planted along the rear middle half with *Vallisneria spiralis*?

Hypessobrycon flammeus would fit the bill. It averages about 1½ in. and the male, in particular, is vividly coloured in shades of olive-brown to green overlaid with a brassy to silvery violet sheen. There are two vertical dark markings on the shoulders, the unpaired fins are intense flame red as is the posterior part of the body. The underparts are silvery to satiny white.

Visiting London a few days' ago, I bought a pair of livebearers called bishops. I cannot find anything about this fish in my books and would be extremely grateful for whatever information you can give me about care, country of origin and maximum size.

by Jack Hems



Brachyrhaphis episcopi

The bishop or *Brachyrhaphis episcopi* is native to Central America and countries nearby and is found in still or sluggish-moving waters, fresh or slightly brackish. It requires a temperature of about 75°F (24°C)—a few degrees above this will not cause any harm—and thrives on small live and prepared food. The male grows to about 1½ in. the female a little larger. Broods are rather small and the fish is not a very regular breeder. The books tell us the fry are rather delicate.



Telmatherina ladigesii

I should like to keep a fish I have seen called *Telmatherina ladigesii*. What conditions and food suits this species best?

T. ladigesii is a species for a specialized environment. It requires hard water with a pH value of 7 to 7.4.

THE AQUARIST

It also benefits if about a teaspoonful of pure, unadulterated (non-iodized etc.) kitchen salt is added to every gallon of water in its tank. Once the correct or advised amount of salt is added to its aquarium, it is best to desist from adding any more. Float the plastic bag housing the newly purchased *T. ladigesii* in the prepared tank for about a quarter of an hour before unsealing it and permitting the two waters to mingle. Then carefully empty the fish out. The regular live, flesh and dried foods are taken.

Is the blind cave tetra (*Anoptichthys jordani*) easy to keep?

Very easy indeed. All this fascinating species calls for is a tank spacious enough for it to swim around in all levels of the water in comfort, clean sand on the bottom, and a few smooth pebbles to play around when it feels in the mood. A temperature in the middle sixties to middle seventies suits it well. The species is exceptionally sensitive to vibrations in the water and can swim for and find its food in a moment. Any small live food, tiny pieces of lean meat, shredded white fish, flake food is taken avidly. The fish has a life-span of several years.

Will *Geophagus jurupari* breed in a tank with other fishes sharing it?

If *G. jurupari* makes up its mind to spawn, then it will do so whether other fishes are sharing its quarters or not. The female deposits her eggs in the sand or grit where they are fertilized by the attendant male. The fertilized eggs will then be picked up by the female and stored in her mouth. When the female has the eggs stored away, it is best to scoop her up in a net or basin, without scaring her into making mad dashes inside her temporary container, and transfer her to a nursery tank (matured water and same temperature as the tank she has been living in). Within the space of about ten days, during which time no food passes the maternal lips, the eggs hatch out and the fry are soon let out. The mother fish opens and closes her mouth to let the free-swimming fry come and go as the mood moves them or a sudden vibration or unaccustomed shadow sends them speeding for safety. First food should be such things as brine shrimps, newly hatched gnat larvae, sifted *Daphnia*, and dissected earthworms pounded to a mash. Crushed flake food a short time later.

Is it true that there is a golden *pristella* as well as the rather glass-like yellowish-green *pristella* ordinarily sold in dealers' shops?

There is a golden *pristella* and it is a much more attractive looking fish than the type. Why we do not see more of this golden *pristella* is very odd. Perhaps it does not breed too freely or perhaps many of the fry revert to type or are apt to stay sterile.

Please tell me something about a fighting fish called *Betta picta*.

B. picta is a mouth-brooding fighting fish from Malaysia and Indonesia. The male reaches about 2 in. The female slightly smaller. Coloration is not exciting, but the male is the better marked of the two, with a pretty maroon margin to his long-based anal fin. Spawning takes place after regular betta fashion but as the female releases the eggs, the male takes them into his mouth for incubation. This extends over about 12 to 16 days.

I have some really attractive pieces of rockwork dotted along the margins of a garden bed. They are white in colour, except where coated with growths of lichen or algae, and when split apart with a hammer reveal a crystalline structure. Would pieces of this rock be suitable for adding artistic interest to my decorative aquarium?

The stone or rock you mention is no use at all for adding artistic charm to the aquarium. It is so soft it crumbles away under water, and the dust-fine particles become churned up by the fish and clog the pores of the submerged plants under a grey-white dirt-attracting scum. Rockwork for the aquarium must be glass hard, like granite, and not likely to dissolve out substances inimical to the well-being of fish, or if not glass-hard at least not likely to raise the pH value of the water.

What do you think of *Geophagus cupido* as a community fish?

I cannot remember ever having seen this species in a dealer's shop or at a show, but D. McNerny's book, written with the help of G. Gerard, entitled *All About Tropical Fish*, illustrates it and informs us that fish is 'A rather rare and attractive little cichlid which, generally speaking, is not aggressive.' Both sexes are said to reach a length of about 3½ in. It is a bottom-of-the-water frequenter and eats anything. Its popular name, as given by McNerny and Gerard, is cupid cichlid.

Can you give me some information relevant to *Pseudotropheus lombardoi*?

Pseudotropheus lombardoi is native to Lake Malawi. In young fish the colours of both sexes is in shades of blue, but as sexual maturity is reached the female remains a beautiful shade of blue with vertical blue bars while the male changes colour to yellow. The fish is aggressive and requires a temperature in the upper seventies or lower eighties (°F). It is no problem to feed, for it accepts dried, flesh and live foods. *P. lombardoi* is a mouthbrooder and after the eggs have been laid the female takes them into her mouth for incubation which lasts, according to the temperature of the water, for about ten days to a fortnight or thereabouts. The

ditions and the amount of oxygen. When fresh fishes are introduced there must be less oxygen for all and some may die. You probably found the dead fish in the mornings. This is the usual time to find dead fish with no signs of disease or injury. They die in the night because the water plants do not give off oxygen at that time and so the fishes are asphyxiated. It is very surprising how soon oxygen can be used up by fishes. Place a few fish in a small container, especially one with a narrow surface, and the fishes will be mouthing at the surface for air within a few minutes, having used up all the oxygen in the water.

As for quarantining Koi, the reason why yours have died is probably because there has not been enough surface area of water to provide oxygen for them. Like Orfe, these fish need plenty of oxygen.

Please can you send me the address of someone who breeds show quality fancy goldfish? I am interested in Fantails, Lionheads and Moors.

I am enclosing an address but I must warn you that show quality fancy goldfish are not as common as you may think. From the finest pair of show specimens, many differing shapes of fish may appear. In a spawning of a hundred fry, one would be satisfied with ten per cent of good fishes and even then there may not be more than half of those perfect show fish. Having bred fancy goldfish for many years I know the problems and am certain that if you really want to get a few very good fish, the best way is to buy the best you can get, breed from them and then pick out the best for breeding from again. It could take a few years before you can establish the strain you long for.

A friend gave me two Bitterling. He told me

that he had seen a long tube hanging from one of the fish and had cut it off. Was this the ovipositor of the female and will it grow again as I would like to breed from it?

The tube was no doubt the ovipositor of the female. Bitterling females insert the tube inside a fresh water mussel and lay their eggs inside it. The male releases the sperms and these are sucked into the mussel and fertilise the eggs. They remain inside the mussel until they hatch and for a time afterwards before they are released. It is questionable if the tube will grow again and be able to function properly. Fins will grow again if damaged but I doubt very much if the ovipositor will be of use any more.

I have three ponds the largest being 40 ft. x 19 ft. and 10-12 ft. deep. I would like to breed Orfe and have ten fish 8-9 inches long and there is plenty of Elodea in the ponds. The fish were young ones and 2½-3 inches long last year. Will they be able to breed and have you any advice on breeding Orfe?

You have plenty of swimming space in which to breed Orfe. However, the large pond will have to have some floating fine plants or fine roots at or very near the surface in which the fish can lay their eggs. They prefer to spawn in shallow water or on plants at the surface. They must have a well oxygenated water and so frequent cold water must be run into the spawning pond. You may do better by spawning the fish in one of the smaller ponds so that you can save the eggs better. Feed the fish well on live foods such as garden worms and maggots. I have known Orfe to spawn in quite small ponds when they are smaller than yours.



ADVANCE NOTICE

THE FEDERATION OF NORTHERN AQUARIUM SOCIETIES

Members of The Confederation of United Kingdom Aquarists

in collaboration with

THE AQUARIST AND PONDKEEPER

present

THE 29th BRITISH AQUARISTS' FESTIVAL

at

BELLE VUE MANCHESTER

on

SATURDAY and SUNDAY 8th 9th NOVEMBER 1980

Which of the usual coldwater fishes, other than coarse fishes, are able to stand cold conditions in the outside pond the best?

In my experience I am sure that the Golden Orfe is the pond fish best able to stand cold conditions. They never appear to be in trouble no matter how cold the garden pond becomes. On the other hand, when the water becomes very warm in summer, especially in thundery weather, Orfe are the first pond fishes to be in trouble as they need plenty of oxygen, being such active fish. It is therefore necessary to provide a well oxygenated pond for these fish and a fair sized one as they are fast growers, to eighteen inches in length.

I have a garden pond about 100 square feet and varying in depth up to 2 ft. 3 inches. I have had it for fifteen years trouble free until this winter. It is cleaned out every three years. From December to the end of February it was frozen over about four inches thick and covered with snow for most of the time. I had a heater which kept a small hole open. I later found 24 large goldfish dead, only a few small ones were left. I have not lost any fish before. Where did I go wrong?

Conditions have been very severe and especially in your area. I am sure that the main reason why you lost the large fish was that they could not get enough oxygen and so were asphyxiated. Had you cleared the snow from the ice every day, you may have got away with no losses. It is fatal to leave snow on a frozen pond for more than a few days, even two days can be very bad. The water beneath cannot get any light and this tends to make it impure especially if there is a quantity of decaying matter on the bottom. The small hole kept open by the heater would have made very little difference as it would not have allowed much fresh air to get to the water. You should have removed the snow every day. This can be done by playing the hose on it, or sweeping it off. Then it could have helped if, once the pond was frozen over, if some of the water had been removed. As long as there was a fair thickness of ice, it would not have fallen into the water and there would have been an air space beneath the ice. This could have enabled the water to have obtained some oxygen.

Many fishkeepers do not realise how much oxygen a fair sized goldfish requires. Your pond should not hold more than 100 inches of fish, not counting the tail. As you had 24 goldfish 15 years old, apart from smaller ones, it is probable that the pond was over-stocked with fishes. Try this experiment next summer. Take a bucket of water from the pond and place two five inch goldfish and two three inch goldfish in it and leave it for a while. Within about an hour the larger fish will be gasping at the surface

for air, but the smaller ones may not then be in trouble. It is surprising how much oxygen is needed by large fishes.

I have a coldwater tank 30 x 12 x 12 inches and cannot get any good gravel. Would it be all right to use white spar as used by builders for decorating the outside of houses?

The white material used could contain lime and this could be harmful to fishes. Even if it was boiled, there could be trouble from it in time. Try to get some washed river grit as is used by nurserymen when making up potting compost. This is very good, being not too fine and not too coarse. If very fine sand is used it can pack solidly and so prevent water plant roots from entering. If too large pieces are in the compost the siphoning tube could be blocked.

I have two tanks, 24 x 12 x 12 inches and would like to breed Lionhead goldfish. I shall leave one tank for hatching and rearing and put five or six breeding Lionheads in the other. The fish will be removed when they have spawned. Is this a good idea?

You may never have seen goldfish spawning and so cannot realise how vigorous this can be. To have five goldfish in a tank the size of yours when spawning, could be very dangerous to a female. It would not have much swimming space in which to escape the attentions of vigorous males. I suggest that only one male should be in the tank with one or two females. Under such conditions you could be successful. However, the number of fry which could emerge from a single spawning could run into hundreds and the spare tank would be of little use once the fry grew to an inch long overall. If a number of fry are bred it is possible to use several plastic washing-up bowls for rearing purposes.

When do goldfish spawn in a garden pond and how often?

Goldfish can breed when they are about three inches long overall. Their age is not important as it is the way they have been reared which regulates their spawning size. Goldfish which have been bred in a garden pond are not likely to be large enough to breed by the following spring. If they had been bred under warm conditions they could have grown to three inches long by the winter and so have bred the following spring. Goldfish usually spawn in the spring, perhaps late April or May. They can then spawn every month throughout the warmer months of the year. In a warm October it is possible for goldfish to spawn but usually the breeding season is over before the end of September. Such late spawnings are of little use to the average pondkeeper as it may be impossible to get the fry through the winter unless they can be brought indoors and given warmth.



MARINE QUERIES

by Graham F. Cox

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.

I am considering starting a marine aquarium to keep octopi. Please can you advise me as to:

- (1) The species of octopuses most suitable for the home aquarium?
- (2) What is the most suitable tank size?
- (3) What are these animal's water chemistry requirements?
- (4) What is the best type of filtration for an octopus aquarium?

(1 and 2) Known species of octopuses which can successfully adapt to aquarium conditions range from the Blue-ring Octopus which I have received from both Manila and Djakarta at less than 3 in. span (i.e. tip-to-tip of two diametrically opposed tentacles) up to the giant octopi which I have seen in the icy coldwater off the N. Western coast of America and which can exceed 12 feet span.

Whereas the latter species would be impractical unless you live in a stately home, the different species of dwarf octopus are quite happy in a 48 in. x 18 in. x 18 in. (56 gallons = 255 litre) marine aquarium. The larger Indo-Pacific and Mediterranean species which are usually available at 20 in. - 30 in. span really need a 60 in. x 18 in. x 24 in. (90 gallons = 400 litre) if you are to have any hope of success.

Caution:

- (a) All octopuses can bite.
- (b) The bite of the Blue-Ring Octopus usually proves fatal within 20-30 minutes.

- (c) The Aquarium **MUST** have very close-fitting cover glasses.

(3) Water chemistry

pH	normal diurnal range of 7.9 to 8.3
Nitrite	nil
Nitrate	no more than 5-10 ppm
Phenols	nil
O ₂ Tension	as near saturation as possible
S.G.	in the range of 1.018 to 1.030 depending on origin (consult supplier)

As you will perceive from the above, octopuses are not really any more demanding with regard to water quality parameters than many other invertebrates/coralfish *except in their notorious intolerance of high nitrate levels*. Thus, if you are to succeed in keeping an octopus for years, rather than just having it as a bird-pulling gimmick for a few days, you will have to be exceptionally conscientious in both the monitoring and control of nitrate build-up. This you will achieve by either regular partial water changes or algae-harvesting or both.

Phenol content is also critical to the good health of the octopus, as it is for the other more delicate species of marine-life. Consequently your aquarium should contain an adequately-sized internal box-filter full of high-activity marine charcoal. This charcoal should be renewed whenever, looking lengthwise through the aquarium, the seawater has an unpleasant yellowish tint. Phenols, and other related non-biodegradable organic toxins also imbue the seawater with an unpleasant foetid odour.

Continued on page 62

Commentary

by Roy Pinks

FOR OVER 20 years I felt that I could do without Barbs in my tanks, and I have never been able to advance a very good reason for this prejudice. When I analyzed my thoughts on the matter I nearly always came up with the answer that this group consists of rather heavy-feeding fish, and that in consequence their tanks were likely to require some filtration aids if they were to avoid that pea soup effect which comes from maldistribution of mulm. I have rigid objections to undergravel filters in freshwater tanks, too, and I had no real wish to take on additional maintenance problems by incorporating external filters, nor did I wish to spend more money on the power needed to motivate them. So it didn't look as though the Barbs stood much chance as candidates for my vacant 36 in. tank—at least it was essentially vacant as it merely contained at the time my 2 large Knife Tetras and the Red Tailed Black Shark.

Discus

I did consider Discus, but as I had a nice collection of plants which were steadily establishing themselves, I passed away from the notion, as these would soon have disappeared, and I could not bring myself to contemplate plastic substitutes under any circumstances. So I had to reexamine my aims for this tank, and as I wished it to be in contrast to the tetra tank, I concluded that the inhabitants would have to be of a totally different disposition if they were to please at all. The tetras as a whole are fairly staid and well behaved and dignified little fish, and they do not often obtrude themselves on the observer. They are, thus, very restful creatures, and their tanks are suitable for close study, especially if they are heavily planted, as individual fish seem to be able to appear and disappear rapidly, almost without turning a whisker, and they thereby provide many visual surprises.

Perpetual motion

Some fish, by contrast, can be positively disturbing and irritating because of their incessant and apparently pointless movement, and I find this most marked with the livebearers and the danios. Taking live-

liness into account, and linking this with colour range and potential quantity of available species, I found that I was talking myself into trying at least some of the Barbs. I knew that certain of the species were, so far as I am concerned, rather dull and too large for the average tank, but at the other end of the scale some of the more popular species, used in small shoals, might well provide the effects I sought. I was primarily concerned with a colourful display of basic fish—none of the mutations, attractive though they may individually be—and whether or not they bred was rather beside the point. Obviously I would like to get them into such condition that they would regularly spawn, but I was not concerned with potential offspring, as breeding, other than for the pure enjoyment of it, is just not worth it.

Barbs

I decided on small groups of Golden Barbs, Tiger Barbs, Black Ruby Barbs, Chequer Barbs and Cherry Barbs. I might add Cuming's or Rosy Barbs if I saw particularly good specimens, but those chosen represent the commonly available aquarium species. I was interested in establishing this collection also from the point of view of dietary and general management requirements, and to watch for any incompatibilities. The Tigers are notoriously difficult in this respect, and this seemed likely to present a major problem. As I recall the species, the viciousness is not confined to attacks on outsiders, and it treats its own kind with just as much evil intent, sometimes to the point of murder. I wondered whether, having acquired a small group of this species, I might manage to develop any means of smoothing out enmities by purely physical management processes. I doubted the success of this very much, as fish can rarely be trained to do tricks beyond taking food from your fingers, but the social relationships of the Barbs promised, at the very least, to be full of drama. My hope was that the theatricals would stop at that point and not overrun to the extreme of tragedy. One has to bear in mind that if a tank is set up in which bloodshed may occur, the fish house is the place for it, not the average home, and we should aim with the domestic aquarium to achieve conditions which are

THE AQUARIST

agreeable to all. To many people who may visit us and watch our fish, merely harmless bullyings may be extremely distasteful, and anything more violent may be completely repugnant, so we should take this very much into account in determining how we make up our mixtures.

Howler of the month

LAST SEASON I tried out some Phillips Pond Pellets despite reservations I had about the real need to pump such rich fare into pond fish during the height of the season. I am certainly not alone in believing that in the under-stocked pool there is usually enough by way of plant and live food to keep the fish in good condition, though I would always agree that in May (when things are usually under some strain) and in September (when the fish are taking in reserves for the winter), there would be good reason to supplement the naturally provided diet with something more substantial and reliable. Used in this way last year these particular pellets were quite successful, they were obviously relished by the fish, and a good rate of growth and well-being were achieved. I



Federation of British Aquatic Societies

May 1, through your columns, thank everyone concerned with the staging of the *Aquarist Fishkeeping Exhibition* for their untiring efforts which made the Exhibition's return to the Capital such a success.

The 'Aquarist & Pondkeeper' magazine supplied the foundation on which the Show Committee of the FBAS was pleased to mount the competitive side of the Exhibition, but the whole operation could not have functioned at all without the small army of helpers and Stewards which took over Alexandra Palace from the Tuesday to the Sunday. Laurie Brazier, the FBAS Show Secretary and his assistant Colin Richards, had their task made so much easier by the dedication of the round-the-clock teams of Stewards under the direction of Bill Nethersell, the Chief Steward, and Terry Woolley who led the insomniacs through the night hours. The driving force was maintained by the constant refreshments dispensed by May Nethersell, who once again qualifies for the Golden Teapot award.

We would also take this opportunity to thank 'The Aquarist & Pondkeeper' for making the Exhibition possible in the first place, and to all those exhibitors and visitors who came to the Exhibition, we

October, 1979

noted on the canister that the directions were to feed daily from early spring to late autumn or when the fish stop rising. And not to overfeed.

I recently, on the strength of the above success, bought a small carton of pellets from a different supplier (Phillips, alas, were not available!), and the instructions were to feed morning and evening in Summer, and once daily in Spring and Autumn. Less in Winter. It was a pity that I omitted to read this highly misleading instruction before I bought the article, because had I done so I would have refused it. Not only is it completely at variance with the real requirements of the average pond fish, but it also encourages the uninitiated to add food to the winter pond, which could bring about a total loss of stock under severe weather conditions. Perhaps the firm does not realize that if losses could be proven to stem from this single cause it could be held legally responsible for replacements. Those who market products like these could do us a service by suitably protesting to the promoters or, better still, refusing to sell until the labels had been corrected. Or perhaps they, too, know no better.

hope you enjoyed it. Our friends in the Trade ably supported the event, and we think that secretly, Michael Fish, BBC TV's Weatherman, pulled a few isobars to provide three days of glorious weather for us too. On behalf of the FBAS Show Committee, "Thank You for a great Exhibition."

DICK MILLS,
(Chairman, FBAS
Show Committee)
70, Lee Road,
Greenford, Middx.
UB6 7DB.

OBITUARY

It is with regret that I have to announce that our chairman, Hugh Parrish, passed away on Saturday, 28th July, 1979 after a short illness. He was our Secretary for many years and for the past three years filled the role as Chairman. He was what we term a good club member, who, together with his wife Sylvia was always willing to get involved with every project we undertook, and when support was flagging represented us at many far-flung corners of the country. He will be sadly missed by his countless friends and colleagues of the F.B.A.S. council, the Magic Circle and other Societies, and in particular his friends and members of Hounslow D.A.S. We extend to Sylvia and her family our heartfelt condolences.

JOHN CARPENTER
P.R.O.
Hounslow D.A.S.

Coldwater jottings

by Frank W. Orme

NOT SO LONG ago a visitor was airing his views to me about the hobby in general—and fish shows in particular. He complained that present-day shows did not appear to attract such large numbers of entries as they once did, yet it was seldom that the public were admitted on time. Often he had been annoyed by having to wait, with others, for an hour or more while the judges completed their duties. In his opinion this caused frustration and, he said, had not used to occur with any frequency in 'the old-days'—if it did there was always an apology made. Nowadays these delays are accepted and taken as a matter of course by the organisers, who expect the public to do likewise. Another complaint was to the effect that, at one time, show programmes were produced which listed the exhibits and the names and addresses of the exhibitors—this allowed interested members of the public to mark down the placings awarded by the judges, and know who had entered which fish. He regretted that few show committees thought it worthwhile producing these programmes for the modern shows, despite the added revenue they would produce and the interest they would provide to the general public. Production costs could be covered by advertisements charges for insertions by both dealers and, possibly, fishkeepers who had stock for sale. It was remarked that these were an interesting feature of the programmes of the past. His final point was that he felt more should be done to provide entertainment for those who were not hobbyists, but had gone to the show with one who was. By coincidence, my son has passed a similar comment. During the past few months he has been driving me to various events, (I have had a temporary medical caution against driving any distance), and, not being interested in fish overmuch, has found the show scene rather boring. "Why" he has asked, "aren't other hobby interests invited to put on a display—if, apart from fish, there were displays by modelling and railway enthusiasts,

art societies, gardening, cacti, floral arrangement and similar groups, the shows would be much more interesting—and would quite possibly attract a much larger attendance gate from a wider section of the public."

Although I am not going to pass comment, or make any observations, in respect of my visitor's complaints, it might be interesting to hear what others think—I know that he is a regular reader of this magazine. In-so-far as my son's suggestion goes, it is obvious that at the majority of the smaller shows there just would not be sufficient floor space available to accommodate any additional stands—although it might be feasible at others.

* * * * *

Healthy neglect?

There are those who consider it unnecessary to give a pond an annual clean-up and, laughingly, point a finger of scorn at those who do consider it necessary. "Why bother to disturb things? The bottom silt will do no harm, and the disturbance created by the zealous pond-owner, by emptying and refilling, could upset things" or so the argument goes. However, even the largest pond may at some time need dredging to prevent it flooding surrounding land. If the silt is allowed to accumulate it will eventually greatly reduce the water depth and, given sufficient time, it is even possible for the pond to disappear—becoming merely a damp hollow—for Nature will attempt to eradicate the pond which she originally created, by the incursion of wind-blown debris, the gradual build-up of excreta from fish and other animals plus rotting vegetation and animal matter. As the water depth becomes less so does the rate of evaporation increase. The margins become ever more exposed to the air, and these are colonised by terrestrial plant-life. This degeneration of a pond is a continuous process unless steps are taken

THE AQUARIST

to retard or prevent it happening. If this is true of a large natural area of still water, does it not apply even more so to the average sized ornamental garden pond?

Many of those who did not consider this so, and allowed their ponds to remain untouched over a longish period, paid dearly during last winter. Numbers of fish were lost, many due to the noxious conditions which arose from the gross accumulation of silt when the water surface became ice-bound for unusually long periods. Who knows, perhaps some will have revised their opinions after last year's experiences—but I doubt it!

Perhaps I may be thought to be over fussy, if that is so—well, people are entitled to their opinions, but I make a habit of cleaning my own pond out every autumn and often give a light clean-out the following spring. I would advise all who have a modestly proportioned pond in their garden to make a habit of giving it some attention before the onset of winter—cleanliness can do no harm; can the same be said for neglect, or laziness, allowing dirty conditions to prevail?

* * * * *

Do it now

During either this month or next this task can be attended to. Mainly for the benefit of newcomers to pondkeeping, I will briefly outline the essential points. First reduce the water level to a depth that eases the difficulty of catching the fish, which should be netted and then placed into a suitable container, making sure that the container is then removed to a position where it cannot be accidentally knocked over. The remaining water can then be removed to the level of the bottom mulm. Carefully sift through this black ooze, to ensure that no fish are hiding there, before tipping around the garden. The strong smell will soon disappear in the fresh-air, and it will help to enrich the soil—being composed mainly of rotted matter of one or another.

Next prune the plants to remove any dead parts, before hosing with a gentle jet of water to remove any algae or sediment from the planting medium etc. Whilst attending to this job, do not neglect to tidy up the marginals and surrounding areas of the pond. Having cleaned and generally tidied up the vegetation, hose down the inside of the pond to swill away all loose matter, and scrub away any algae that still adheres. Get rid of the dirty water that has collected, and repeat the swilling until the water, which collects appears to be reasonably clean. It can then be emptied for the last time before refilling with clean water.

Whilst the water is slowly filling the pond the fish can be inspected for any signs of injury, pest or disease. The chances are that nothing will be found amiss. However, if this does not prove to be the case the appropriate action can be taken, before they are returned to their cleaned home. Take care to see that the water temperatures are equalised before allowing

the fish to swim free, this is most easily accomplished by allowing the container to float in the pond for a time.

When the task has been completed you will have the satisfaction of knowing that you have provided the best possible conditions for the fish and, failing any unforeseen mishaps, they should stand every chance of surviving the winter temperatures. It only remains to keep the surface free of wind-blown leaves—it is a good idea to stretch a net over the pond during the autumn, which will help to prevent much of this debris falling into the water.

Consider the amount of silt that was removed during this cleaning operation, then decide whether it would have been better to leave it in the pond. Most people will, I think, agree that it is better out. However, if, having read this, you still consider it a waste of time to clean the pond all I can say is "Why not do it anyway, who knows, you might benefit from the exercise—and the fish might appreciate the unexpected consideration!"

* * * * *

Frog-eyed moor

I am often amused, as I am sure others are, by some of the statements and questions from that are made by those who, perhaps, have one or two goldfish in the still used 'fish-bowl' and have no understanding of them. I recall an incident that took place some years ago; a lady visitor to my fish-house avowed categorically that the telescope-eyed varieties of goldfish had been created, in the distant past, when the Chinese managed to cross a goldfish with a frog (?). Despite all arguments, as I tried to convince her that such a happening was impossible, she stuck firmly to her belief—I wonder if that is still her belief?

More recently I was informed, by a partner in the company where I work, that he thought his daughter's goldfish was "pregnant." I was told that she had won three goldfish at a local fair and one had become "very fat." "If I place it in a washing-up bowl, by itself, how long will it be before she has the babies?" he asked. I gave him a "fishy sex lecture" explaining the "facts of life" concerning goldfish and their procreative habits. "You mean that they don't have sex like us or birds and other animals?" he exclaimed. He was genuinely surprised at the revelation—"Well I'll be damned, there can't be much fun in that!" he remarked when I confirmed that there was no sexual connection involved. A little later I was amused to hear him delivering a "learned" lecture about the goldfish and its habits to a rather bored female office staff.

Yet, when you think about it, after all of the various nature films that have been shown on the television screen, many describing the life cycle of fish such as salmon, it is almost unbelievable that some people are still lacking in such elementary knowledge.



LOOKING AT STICKLEBACKS

by Cleeland Bean

upper river habitats. Be this as it may, our other little ten-spined stickleback readily takes to living in a mixture of both fresh and salt water in marshy places at the mouths of rivers. Yet despite being found there it is also a typical freshwater denizen existing in locations well away from the sea.

COMMON THOUGH IT IS, the three-spined stickleback (*Gasterosteus aculeatus*), measuring not more than three inches long, makes an interesting subject for study in the aquarium. Scientists are still finding out new things about this species regarding its general behaviour patterns, reproduction habits and the apparent genetic effects which can cause specimens to vary in appearance. Two other relatives include the smaller ten-spined stickleback (*Pygosteus pungitius*) and the much larger fifteen-spined stickleback (*Spinachia spinachia*)—the latter being the biggest of the three at a length which extends from six to eight inches. It is a curious, thin, elongated fish, and as a marine species is common enough in shallow coastal regions and rock pools.

Observers are sometimes surprised at finding three-spined specimens thriving quite successfully in brackish water, but one is more likely to see them in estuaries after heavy rain, when floods will have washed considerable numbers down from their

Mail-checked Fishes

When seen at close hand in the aquarium the common stickleback reveals that it belongs to a large group comprising the mail-checked fishes. These are distinguished by a bony formation extending from beneath the eye to reach the gill-cover. Within the same grouping come the rock perches, scorpion fishes, Norway haddock, the lion-fishes of the tropical Pacific, the gurnards and the bullhead or miller's thumb, etc. What we also notice about the three-spined stickleback is the absence of scales; in place of such is a tough, silvery skin supported by a number of bony plates and the well-known spine structures. As a class the stickleback family is widely distributed throughout the Northern Hemisphere in Europe, Northern Asia and North America. The species is likewise found in coastal and freshwater regions ranging from the temperate zones to the Arctic.

From a survival viewpoint, sticklebacks are indeed hardy creatures in terms of their toughness to withstand river pollution, seeking out of food supplies and

Continued on page 42

continued from page 40

reproduction of themselves. They certainly make admirable subjects of study for the aquarist who may wish to observe their interesting breeding habits. Unlike fish generally our three stickleback species build nests for holding their eggs, and the behaviour patterns associated with this performance present remarkable biological actions which can make us wonder where to draw the line between purely instinctive habits and a form of simple intelligence. Both qualities would seem to be needful, yet under aquarium conditions the innate or genetic effects of the stickleback's nest-building activities obviously command a major portion of the field. On the other hand, the fish can be taught to associate special colours with food when this is placed on circular cards or discs held above the water. Specimens have been trained to jump up and retrieve food from similar coloured discs or squares.

Red sensitivity

We know, of course, that during their courtship phase male and female sticklebacks are extremely sensitive to red; it is then that the male becomes a splendid fellow displaying red patches on his throat and belly. Distinctive too is the whiteness of his body merging into reddish and blue black hues. Compared with her partner the female retains the greenish colour and silvery undersides common to both during the non-breeding season. Experiments show that the female needs to be stimulated by her mate's red livery if successful breeding is to take place. But the same stimulus produces aggressive attitudes in the male towards others of his species; so much is this the case that he will immediately attack a red object held in front of him. The mating rules here are rather similar to those which apply to cock robins regarding their readiness to lunge fiercely even at artificial bundles of red feathers.

The strong territorial instinct of the stickleback makes it necessary for aquarists to leave the fish with plenty of space for breeding manoeuvres. Those sharp spines can become lethal fighting weapons within confined areas where furious duels are occurring. But usually under natural conditions the losers of the most savage fights manage to escape being killed. Some people believe that sticklebacks remain pugnacious at all times, yet this is not so once the breeding period has passed. Then it will be seen that shoals comprising both males and females are found in open water, and that the sexes look alike with greenish coloured upper parts offset by silvery sides and belly.

Mating

Strangely enough, the male stickleback when staking out his breeding territory and building a nest, remains indifferent to the female of the species.

It is only when his nest has been completed that his amorous adventures begin in a flurry of activity which more than makes up for an apparent lack of interest. In turn he sets out to capture four or five females as inmates for depositing separate egg clusters in his nest; a polygamous situation thus develops with the male taking full care of the eggs and young without any help from the female.

If we wish to study the entire breeding cycle behaviour pattern in the aquarium we will need to ensure that sticklebacks have sufficient plant cover and ground materials for nest-building operations. Before constructing its actual nests the fish makes a small depression in the sand or mud by using snout and body movements. Instinctively the nest is made at the bottom of a plant stem, and experiments have shown that in the absence of plants, upright objects such as pencils, twigs or metal rods have served as plant stem substitutes. Observations have also shown how in unplanted aquariums the stickleback will make use of the sides of the tank against which to build its nest. These extreme conditions indicate the importance of natural plant stems for inducing normal breeding activities.

After making a depression in the bottom sediment the fish collects small pieces of vegetable matter which it binds together with a secretion exuded by the kidneys. The fragments are laid in the depression and gradually the sides of the nest are built up to form a type of beehive structure having entrance holes at opposite sides. The nest as such is usually not much more than an inch across, and it takes approximately 12 to 12½ hours before the job is finished. During spring and early summer we can easily watch the entire process in the aquarium, and similarly for the marine fifteen-spined stickleback which builds a nest consisting of red and green seaweed strands.

Egg laying

Female sticklebacks are at first rather hesitant about entering these nests and they swim around as if unconcerned about their maternal duties. But the males are persistent partners in guiding their mates to lay eggs, and as tokens of encouragement they take the initiative by making several sallies towards the nesting site. During this stage the female in each instance will follow close behind to watch her master poke at the entrance to the nest with his snout. If she is too slow, in responding he may give her sharp thrusts, or nip at her tail. When the female does enter she is stimulated to deposit her yellow eggs by receiving several trembling prods from her partner.

During the beginning of their courtship phase the male adopts a zig-zag swimming ritual when moving close to his partner, while the female answers these movements by holding up her head, and curling

her tail upwards. The male is then stimulated by the outline of her swollen abdomen, and she in turn is attracted by his red underparts. Because the male plays the part of both mother and father when bringing up the young he is quick to chase each female away from the nest once she has laid her eggs. After every egg-laying session the male enters the nest to fertilise the eggs, and as with the female his head and tail will be seen sticking out at either end of the nest.

Keeping notes

It is always useful for aquarists to keep notes of fish behaviour for these can be most valuable, especially when compared with similar notes of fellow fish-keepers. Fish resemble animals in having their own individual characteristics, and sticklebacks are no exception. Some for example, may be better fathers than others, and perhaps make greater efforts under natural conditions to protect their eggs or young from predators such as water beetles, dragonfly larvae and water scorpions, etc. Then, too, female sticklebacks if given the chance will avidly prey upon eggs and young fish including their own offspring.

Normally the eggs will hatch within seven or eight days, but periods up to twelve days may also occur depending on oxygen intake, water temperature and water composition. During the egg development phase the male stickleback stays on guard above the entrance of the nest; while doing so he skilfully uses his breast fins for sending in currents to keep the eggs well oxygenated. Occasionally the fish may make a closer inspection for safety purposes, and to re-arrange some of the eggs so that they gain the maximum benefit from available oxygen supplies.

Because of the transparent nature of the tiny fish it would be easy enough for the aquarist to miss noting when the eggs hatch. But father's watchful tactics within the nursery area will show us their whereabouts. At times if the youngsters stray too far from home their father may suck them into his mouth for protection, and return the babies to base. Not for a fortnight or so will the stickleback cease to closely guard his family, by then they will have formed the schooling instinct for their own protection.

Physiological changes

Field and laboratory tests have shown that the sturdiness of stickleback broods is related to the physiological changes caused by the amount of chlorine or salt retained in their tissues. As might be expected it is the embryos which will benefit from being in an environment where the temperature and salinity requirements are most suitable. Instances of this are the shoals of ten-spined sticklebacks which will migrate from areas at or near the sea to

swim up creeks and rivers during the breeding season, while the three-spined species moves in from open water to quieter areas for spawning purposes. The fact that freshwaters have a salt content of less than 0.5 per cent shows how important the salinity level would be for sticklebacks moving upstream from more brackish water. Osmotic pressures within each fish obviously come into play according to a changing environment, and it is known that the physiological differences resulting from such pressures are genetically determined. Each fish therefore is thought to select that territory which will best suit the chloride balance of its body.

Along the shoreline observers are sometimes confused by the appearance of the marine fifteen-spined stickleback. The colour of this species varies a great deal, and can range from deep green to a dark reddish brown shade. In the non-breeding season the usual colour is olive green, and the female retains this livery which is outmatched by her much more colourful mate with his underside showing an attractive blue shade. The throat and belly is often a golden yellow colour, although this may be a deeper hue in some specimens particularly during the spring season. Irrespective of colour patterns we will be able to recognise the marine species by the fifteen spines running down its back, while equally noticeable is the narrow, elongated body with a large tail fin and a tube-like snout.

Seaweed nest

The male builds his nest within a sheltered rock crevice or under a ledge where it will be defended vigorously against all intruders. If larger fish happen to blunder into the nest and disarrange it somewhat the damage will be quickly repaired by the tugging and pulling of the seaweed strands into place. Even sea worms will be bodily removed from the nest should they wriggle into its pear-shaped structure. When closely examined the eggs of the fifteen-spined stickleback are found to be mustard coloured and the size of tiny seeds. The species may be observed in shallow coastal areas where seaweeds abound, or amid rock pools.

One point about keeping sticklebacks in an aquarium is that they should be in containers apart from other fish species, including small tadpoles. If this rule is not observed we can expect trouble from those sharp spines and jaws which can inflict severe and fatal wounds. As greedy feeders sticklebacks will also search out and eat the eggs of other fish should these be available. In a wider ecological sense we may likewise note that considerable damage will possibly be done to the inmates of our smaller countryside ponds if containers of unwanted sticklebacks are dumped there by unthinking aquarists. If your fish are to be liberated ensure that large water areas serve this purpose.

From a Naturalist's Notebook

by Eric Hardy

THE snail-darter is a small North American perch-like fish which halted the 120,000,000 dollars U.S. Tellico Dam project in the Tennessee Valley, when a lawsuit was brought under their endangered species act. The dam's flooding of 30 miles of the state's last good virgin river would have eliminated the entire known habitat of this snail-eating fish and made it extinct. The Endangered Species Committee of the U.S. government refused exemption from the act to the dam. In contrast, asiatic catfish which escaped from a fish-farmer's pond near Fort Lauderdale in the mid 1960s are advancing so fast across Florida, preying upon native bass, that it is estimated they will occupy four-fifths of the state in the next decade. They have occupied Big Cypress swamp. These air-breathing "walking" fish are thought by Florida University biologists, to have evolved a cold-resistant population.

The remarkable comeback of the American alligator from the brink of extinction is the success story of reptile-conservation. The export of its hides, made illegal, is even being lifted and controlled hunting returned.

Conservation

Conservation in Britain is less dramatic, but we are committed to conserve our wetlands. Internationally important state reserves include Norfolk's Hickling Broad and nearby Horsey Mere, the Welsh bogs of Cors Fochno and Dyfi, Loch Leven, Loch a'Machair and Loch Stilligarry, Lough Neagh and Lough Beg. There are regionally important reserves like East Cramlington clay-pit, Ford Moss peat-bog and Kielderhead Moor in Northumberland; Hurn Forest pools and bog and Moors River Water-Meadow in Dorset, Milkhall pond and marsh and the Red Moss of Balerno in the Lothians; Spye Park wet meadows in Wiltshire; Newbourne Springs in Suffolk; Street Heath raised bog in Somerset; Waltham Brooks water-meadow in Sussex, Wollaston Black Marsh in Northants; Walden Marsh and swamp in Worcestershire and Vedw Turbarry marsh on the Hereford-Powys border. Local authorities also preserve Coate Water in Wiltshire, Derbyshire's Cromford Canal, mid-Glamorgan's Kenfig Burrows lake; Martins

Pond in Nottinghamshire and Oxfordshire's Vicarage Gravel-pits. Also notable reserves are Rostherne Mere (Cheshire) Blelham Tarn (Cumbria) and Loch Lomond.

Maybe that is not such exciting water-life research as a recent ultrasonic tag for telemetric studies of the physiological functions of aquatic animals, devised by Bottoms and Marlow. Even if our well-funded professional researchers will have to draw their horns in with the national economies necessitating cuts (the Council for Nature already proposes to dissolve next March, and the Nature Conservancy Council has cut its outside grants) it is difficult to keep pace with progress on a broad front. One method is by the small *Studies in Biology* manuals, of which Edward Arnold have published over 100.

Aquaculture

One recently published volume in the series I have been reading is *Aquaculture* by Dr. P. J. Reay of Plymouth Polytechnic (£1.75p) which covers the scope, spawning hatcheries, growth and feeding, parasites and environment of culturing fish like Tilapia, rainbow-trout, milkfish, even mud-skipper in Taiwan, and turbot, as well as crayfish and oyster. Though Aquaculture now raises 314 species of fish, 74 crustaceans, 69 molluscs, 9 amphibia and 4 reptiles, only carp (especially South-east Asian varieties of Chinese Big Belly, a separate sub-species) and rainbow-trout have domestic varieties. The highest production is achieved with a mixture of compatible species (neither Tilapia nor grey mullet is compatible with milkfish) with protein-rich pellets in low latitudes where the growing season is long.

Brine-shrimp is the most important hatchery food, with 43 species of single-celled algae reared for shellfish larvae. Israel has a high, more economic yield of pond carp using cow-manure as a source of protein; China uses pig and duck-manure and the future may see fish-farms using treated or untreated human sewage. Tilapia, grey mullet and milkfish thrive in either freshwater or salt.

Though spawning is achieved readily with carp, channel catfish, Tilapia, turbot, caridean prawns, crayfish and some oysters, it is so difficult with many

others like milkfish, grey mullet, eels, and penaeid prawns that wild restocking is necessary. However, by light control grey mullet in ponds ripen better at 22°C and 6 hour day-length, which stimulates yolk formation in the egg. Spawning is advanced in rainbow-trout by similar manipulation of the light period, whereas spawning is achieved in prawns, and growth speeded in lobsters, by removing the eyestalk which stores the inhibiting hormones. Tilapia, which normally nest on the bottom, will not breed if denied access to the bottom of the tank by mesh, or sometimes eggs will be lost through the mesh. Cold-shocking certain eggs like plaice, or chemical treatment as with salmon, produces faster growing sterile offspring.

Disease Free

Dr. Reay sums up every aquarist's wish to be disease-free by the use of borehole (spring) water, compounded diets, gravel filters, disinfectant water-baths for hatcheries, burying dead fish in lime-pits, and draining and drying earth ponds for at least a month each year. High dissolved oxygen levels, a pH between 6.5 and 9.0 and suitable diet avoid stress which lowers fish resistance, especially salmonoids.

Most observers noticed lizards sunning themselves, even turning their palms outwards for maximum warmth, when they are cold, and seeking shade, especially in deserts, when too hot. The world's 3,000 lizards cannot manufacture their own body-heat like mammals, but use the sun to regulate it to a precise level. This is the basis of another recent paperback in this series, *Lizards—A Study in Thermoregulation* by Dr. R. A. Avery of Bristol University. By inserting a 0.5 gram radiotelemetric thermostat into the rectum of large or medium lizards, with wires to the roof of their cage, a continuous recording is obtained of body temperature. A 250 W. incubator-lamp suspended over them simulates the sun, varying voltage so that radiation follows a sine wave similar to solar radiation, to observe basking behaviour. Outdoors the common viviparous lizard emerges about 0745 am GMT on a midsummer morning, but its evening retirement depends more upon how much it has fed, than direct sunshine. One was abroad in Wiltshire on 8th January 1961.

These high temperatures increase the digestive efficiency of the lizard, and basking behaviour is guided by the hypothalamus in the brain. The right and left ventricles of reptiles' hearts, unlike mammals and birds, are connected by "shunt" arches and can alter the relative rates of blood-flow to the lungs, head or body, but maximise heat-gain or minimise its loss. Desert lizards darken their skin when the air cools, to increase heat-absorption when basking, or pale their skin when they reach their most active temperature as light colour insulates against heat.

The reference literature omits D. L. Bostic's paper on Thermal Relations in the Mexican toad *Onomatophorus labialis*, in the 1968 Trans of San Diego Natural Hist. Soc.

Again there is useful advice on captivity, where the commonest failures arise from incorrect heating. A 250W chicken incubator-lamp switched on 4 to 8 hours a day serves for most large cages, 100W for smaller cages; but lizards must have shade like folds of cardboard, to lose heat. Cool periods when the lamps are switched off are as important as when they are on. Temperate lizards are often killed when placed in continuous heating, and though non-basking tropicals do not need this radiant heat, they chill if the temperature falls below their 25-30°C ambient. Crickets are an easily-bred source of food, with fewer mealworms which are very short of minerals, unless vitamin D is added to the food or drinking water. Natural sunlight does not cause this vitamin deficiency. Fluorescent tubes don't provide adequate heat. Dew-drinkers have their water sprayed on the cage, desert-lizards through the skin; these may die if only water-containers are used. Lizards which normally hibernate won't breed if prevented from doing so.

Adder Bite

A non-fatal adder-bite to a schoolboy holidaying at a well-known haunt of these snakes, the Leet valley at Loggerheads, near Mold, North Wales in August, occurred when he grabbed hold of the snake when rock-climbing on their favourite slope. The R.S.P.C.A. wishes to tighten up the Dangerous Wild Animals Act of 1976. Its executive director has claimed that the American hog-nosed snake, "concerned in some poisoning incidents," can be acquired without a licence because it was considered harmless. He stated that the fatally venomous boomslang is also too easily acquired. It seems a strong statement that 1,400 similar Colubrids were likewise omitted from restrictions on private purchase. They wish to ban or severely control the importation of exotic animals and to extend the list of restricted species under the act. The American Audubon Society seems to contradict his fears by describing the hog-nose as "an amiable spreading adder (its nickname) that will bluff and hiss and if this fails to frighten its discoverer, then roll over and play dead." An American sporting magazine *Field & Stream* called the hog-nose innocuous "this much maligned creature" with an awe-inspiring appearance, all bluff, at the worst feigning to strike with its mouth closed. Dr. W. M. Lewis, writing in American "All Pets" magazine, gave it many advantages as a pet, adding "it is of course not poisonous and has no fangs." There is thus some confusion over the R.S.P.C.A. claim that hog-noses have been concerned in poisoning incidents.



'The Original Water Bed' from Dumfries A.S. which was placed fourth.

THE YORKSHIRE AQUARIST FESTIVAL 1979

The fact that most tropical fish are transported by air inspired this excellent tableau from Blyth A.S.



48



Mr. Bob Singleton (Show Secretary) and Mr. Brian Boyden (Chairman of the Show Committee) looking justifiably pleased with the result of their labours!

THE FIFTH Yorkshire Festival undoubtedly maintained the high standard set by previous years and the majority of the many Tableaux were a credit to the Societies which built them.

Mrs. Maureen Wood who enjoyed her first experience as Show Secretary for the event, stressed that there has always been a great spirit of *camaraderie* in the Yorkshire Association. An example of this was the fact that although two members of Bridlington A.S. live in Scotland, they insisted on taking an active part in building their magnificent Society

A view of the beautifully constructed 'One Armed Bandit Arcade' which won first prize in the Tableau Section for Bridlington A.S.



THE AQUARIST

Tableau which on this occasion took the form of a 'One Armed Bandit Arcade' and was deservedly awarded first prize in this section.

Two other Societies were exhibiting tableaux for the first time ever and put on an excellent show. Dumfries and District A.S. must be congratulated on winning fourth prize at their first attempt with a splendid exhibit entitled 'The Original Water Bed' which consisted of a gentleman complete with nightcap reclining in a four poster bed (set on tanks) reading an instructive book on fishkeeping. What else!

The other 'first' came from Wolverhampton Society who had as the centre-piece of their tableau a model of a *Coelacanth* together with all the information available on this fish. Underneath each tank they had simulated fossils of extinct species with a short description of each one.

Best Fish in Show went to Mr. B. Sleight for a

Charax Gibbosus. All the awards were presented by Mrs. Pat Stanton, popular wife of the Trade and Finance Manager.

1979 also saw the innovation of added attractions for the family. The Children's Cartoon Cinema proved a great favourite with parents and children alike. Doncaster Flying Club put on a fascinating static display of model aircraft including a huge helicopter and The National Society of Leisure Gardeners put on a sumptuous spread of home-grown produce. All these items added interest and variety to the Show.

The Yorkshire Aquarists' Festival Committee wish to thank all those Y.A.A.S. members who volunteered to work as stewards, the Racecourse staff, the trade and all those people and organizations which made a contribution to the success of this popular annual event.

Meadowsweets for Poolside Planting

by Philip Swindells

THE COMMON meadowsweet, *Filipendula ulmaria*, although much loved by country folk for its frothy heads of fragrant blossoms, is seldom grown in gardens. However, its beautiful double form, *F.u. flore plena*, and the golden-green foliage variety '*Aurea*' are much sought after and add quiet contrast and delicious fragrance to the poolside or bog garden.

Filipendula camtschatica enjoys similar conditions and with its huge spreading leaves and heavy heads of sweetly scented flowers is reminiscent of a giant meadowsweet. *Filipendula camtschatica elegantissima rosea* is of deepest rose, while *F. c. carnea* has cloudy heads of soft apple blossom pink.

The dropwort, *F. hexapetala*, tolerates much drier conditions and during June and July produces crowded heads of icy white blossoms above neatly rounded hummocks of fern-like foliage. As it rarely grows more than a couple of feet high, it is ideal for the smaller water garden, while those with a natural pool or large expanse of water can accommodate *F. rubra magnifica*, an immense six footer with vine-like leaves and spreading masses of glistening peach-pink flowers.

All the *Filipendulas* are easy going in moist conditions and readily propagated from division or rooted pull-offs in early spring.



scissors I cut off the tip of the leaf—which held five eggs. I simply placed the leaf in a shallow plastic dish floating in the tank. All the eggs left in the care of the parents were eaten—but the five in the dish hatched! At this stage I emptied a small tank of swordtails and subsequent spawnings were removed in toto and lodged in the hatching tank with a stone. The water was treated to prevent fungus and an aeration stone substituted for the fanning of the parents' fins. These attempts failed. The first spawning contracted rampant fungus and every egg was infected. The second and third spawnings both hatched but when the fry were due to leave the floor of the aquarium and become free-swimming, they simply remained where they were and died. I was completely mystified, especially since the five from the plastic dish grew to maturity.

"The two adults, now short of *Cryptocoryne* leaves, continued to spawn on the heater lead, the sealant and the glass. One evening my wife, waiting my belated arrival, pinned the male to the side of the aquarium with a net; but her efforts, too, were in vain.

"The following year the two large adults were given a small tank each and the five, young, adult offspring were put in a 36 in. x 12 in. x 15 in. aquarium. This tank was bare except for the same old *Cryptocoryne*, now standing rejuvenated in a small, glass bowl. It was soon put to use by a very aggressive couple that successfully kept everything at bay and even tried to attack me by darting to the surface, splashing water everywhere.

"Sometimes I thought that they had eaten their offspring, only to discover that they had ferried them to a corner where, again, they stood guard. Neither parent showed the cannibalistic tendencies of its father. When the fry began to change shape I removed them to a growing tank and the parents mated again. Some of the young found their way into the tanks of a local pet shop and some into our school aquarium; but before I could establish a regular turn-out, the saga was brought to an abrupt end by an irresponsible act on my part.

"One day, suffering the symptoms of flu, I stupidly decided to tinker with some dubious electrics. I had the presence of mind to switch off at the mains but, unfortunately, I forgot to turn the heaters back on again and the cold of winter killed every single angelfish in my possession.

"In eighteen years of fishkeeping that was the worst single mistake that I have made and the memory of the adults lying cold and stiff at the surface remains with me."

Mystery virus?

I've used a photograph of spawning angels to illustrate Mr. Pope's interesting letter. His comments about dead angels remind me of the recent death of my last adult angel. I had had it for many years—I

do not recall how long—and it just faded and died from old age. It had mated with a number of females during its life but none of its fry ever reached adulthood. Two days ago I posted last month's copy to our editor and in it I made some comments about my fish dying from an unknown disease some days after the introduction of several new fish: *N. anomalus*, *N. marginatus*, white clouds scissortails and black widows. I can't remember what the exact score was two days ago but this morning one of my two *N. anomalus* was found dead, floating on the surface. Other fish found dead earlier include numbers of guppies, two neons, five cardinals, one scissortail and two *N. marginatus*. The new fish have proved to be very expensive! Last night I decided to change half of the water in their tank and to remove all plant growth and wash the gravel at the front of the tank. When I had completed the cleaning operations—including scrubbing the rocks



(flint) with a brush, in clean water—the surviving fish seemed to be in good health. Both *N. anomalus* looked very healthy and were displaying their colours and fins. This morning one of the pair was dead—and its body showed no signs of any disease. Last week I treated the tank with a 'cure' which obviously did not work. However, I have no idea what the disease is—unless it is a virus infection. It certainly shows no symptoms and seems to be sudden and fatal in its effects. It's sad when new fish bring with them some unidentified disease that wipes out many mature fish that are in fine condition.

The relative paucity of short letters written to me in summer enables me to include another long letter which, like Mr. Pope's, deals mainly with angelfish. It is headed 6 Bulwer Street, Rock Ferry, Birkenhead,

THE AQUARIST

and was written by Mr. M. Kemble. "... From the Basingstoke Aquarist (?) I bought a pair of livebearers, the like of which I've never encountered before. The female is approximately 3 in. long; she is a light brown on the top, merging into a blacker lateral line (not distinct, but speckled) and then into a lighter under belly. The male is about half the length—1½-2 in.—and has the same colouration. As I knew nothing about them and my brother-in-law was the means of delivery, by car, I phoned the Basingstoke Aquarist and was informed that they were *Aneasi* (e). I was told to gravel the tank and to give plenty of plants and cover. This I am in the process of doing. I observed them mating on 11th May 1979 and the procedure was as follows. The female swam low over the gravel and started to quiver. The male swam up to her, they mated, and then went their separate ways. Owing to space restrictions (my wife's ideas!) they are resident in a tank which is partitioned thus: a four foot tank split into one two foot section and two one foot sections. The fish are in one of the one foot sections with an under-gravel filter and an aeration stone; along the back is some *Bacopa* and Java moss, separated from the front by a large, long rock. Some *Bacopa* is already floating on top but is due to be weighted down soon. The temperature is 78°F. I was also told to leave any resulting fry in the tank with the parents. These I will watch out for.

"I should now like to deal with the spawning of angels. I read of your interest in the subject just prior to my angels' spawning so I was able to keep a diary of events. Here goes:

5th May

Large, black, marbled angel and smaller, striped female angel laid eggs on glass corner of my 48 in. × 15 in. × 15 in. community tank. After fertilization I removed eggs to a 24 in. × 15 in. × 12 in. tank, 2/3 full of water. I put methylene blue and a small amount of tonic salt in water, setting temperature at 78°F. Well aerated.

6th May

Approximately 50% of eggs are spoiled. They are lying loose on glass bottom of tank. Water circulation is good.

7th May

No change.

8th May

Eggs hatching. About the size of a letter 'r' in this line. Plenty of wriggling movements.

9th May

Movement continuing. No feeding, yet.

October, 1979

10th May

Fry beginning to move across floor of tank; three times their size at hatching; no feeding.

11th May

Yolk sacs almost vanished.

12th May

Today I introduced a small amount (½ pt.) of green water. Some micro *Daphnia* also introduced; not very many. Fry attempting to rise off the tank floor. 8.30 p.m. I introduced a couple of drops of Liquifry No. 1. I counted approximately 50 fry.

13th May

Two fry seen near water surface. Fed again on Liquifry; changed one gallon of water.

14th May

Fry approx. 4 mm; water depth 12 in.

15th May

Fry swimming about with ease; tending to congregate in one corner of tank. More Liquifry fed to them. Put some *Bacopa* into tank together with small piece of Java moss. Fish changing colour to a blackish hue; they were almost transparent. Characteristics of father?

16th May

The number of survivors appears to be diminishing. Feeding three or four times per day—still on Liquifry. Still tend to remain in back right-hand corner. Temp. is 78-79°F. Water looks a milky blue (Liquifry and methylene blue). 10.45 p.m. Very few fry remain. Gradually change ¼ of water. Temp. 78°F.

18th May

1.21 a.m. Fry very active. I can see them feeding on Liquifry. Could the possible cause of fatalities earlier have been insufficient food? Anyway, I have increased feed; fry appear to feed. Five drops per feed, four times per day. One particular fry prefers pecking at side of tank. They are still in the same corner but feeding well.

20th May

Only 12 fish remain; they look quite fit and strong. Now feeding on Biol (dried plankton) and Liquifry. Fish are now moving about one end of the tank more courageously. Instead of huddling together on the bottom they are now swimming up and down, front to back, but still at the same R.H. end. Temp. still at 79°F; I see no reason to lower it yet. Water slightly clearer since adding Biol. Aeration stone still pounding out the bubbles. The light has been kept on all the time until now; one × 60 watt tungsten

and was written by Mr. M. Kemble. ". . . From the Basingstoke Aquarist (?) I bought a pair of livebearers, the like of which I've never encountered before. The female is approximately 3 in. long; she is a light brown on the top, merging into a blacker lateral line (not distinct, but speckled) and then into a lighter under belly. The male is about half the length—1½-2 in.—and has the same colouration. As I knew nothing about them and my brother-in-law was the means of delivery, by car, I phoned the Basingstoke Aquarist and was informed that they were *Aneasi* (c). I was told to gravel the tank and to give plenty of plants and cover. This I am in the process of doing. I observed them mating on 11th May 1979 and the procedure was as follows. The female swam low over the gravel and started to quiver. The male swam up to her, they mated, and then went their separate ways. Owing to space restrictions (my wife's ideas!) they are resident in a tank which is partitioned thus: a four foot tank split into one two foot section and two one foot sections. The fish are in one of the one foot sections with an under-gravel filter and an aeration stone; along the back is some *Bacopa* and Java moss, separated from the front by a large, long rock. Some *Bacopa* is already floating on top but is due to be weighted down soon. The temperature is 78°F. I was also told to leave any resulting fry in the tank with the parents. These I will watch out for.

"I should now like to deal with the spawning of angels. I read of your interest in the subject just prior to my angels' spawning so I was able to keep a diary of events. Here goes:

5th May

Large, black, marbled angel and smaller, striped female angel laid eggs on glass corner of my 48 in. × 15 in. × 15 in. community tank. After fertilization I removed eggs to a 24 in. × 15 in. × 12 in. tank, 2/3 full of water. I put methylene blue and a small amount of tonic salt in water, setting temperature at 78°F. Well aerated.

6th May

Approximately 50% of eggs are spoiled. They are lying loose on glass bottom of tank. Water circulation is good.

7th May

No change.

8th May

Eggs hatching. About the size of a letter 't' in this line. Plenty of wriggling movements.

9th May

Movement continuing. No feeding, yet.

October, 1979

10th May

Fry beginning to move across floor of tank; three times their size at hatching; no feeding.

11th May

Yolk sacs almost vanished.

12th May

Today I introduced a small amount (¼ pt.) of green water. Some micro *Daphnia* also introduced; not very many. Fry attempting to rise off the tank floor. 8.30 p.m. I introduced a couple of drops of Liquifry No. 1. I counted approximately 50 fry.

13th May

Two fry seen near water surface. Fed again on Liquifry; changed one gallon of water.

14th May

Fry approx. 4 mm; water depth 12 in.

15th May

Fry swimming about with ease; tending to congregate in one corner of tank. More Liquifry fed to them. Put some *Bacopa* into tank together with small piece of Java moss. Fish changing colour to a blackish hue; they were almost transparent. Characteristics of father?

16th May

The number of survivors appears to be diminishing. Feeding three or four times per day—still on Liquifry. Still tend to remain in back right-hand corner. Temp. is 78-79°F. Water looks a milky blue (Liquifry and methylene blue). 10.45 p.m. Very few fry remain. Gradually change ¼ of water. Temp. 78°F.

18th May

1.21 a.m. Fry very active. I can see them feeding on Liquifry. Could the possible cause of fatalities earlier have been insufficient food? Anyway, I have increased feed; fry appear to feed. Five drops per feed, four times per day. One particular fry prefers pecking at side of tank. They are still in the same corner but feeding well.

20th May

Only 12 fish remain; they look quite fit and strong. Now feeding on Biol (dried plankton) and Liquifry. Fish are now moving about one end of the tank more courageously. Instead of huddling together on the bottom they are now swimming up and down, front to back, but still at the same R.H. end. Temp. still at 79°F; I see no reason to lower it yet. Water slightly clearer since adding Biol. Aeration stone still pounding out the bubbles. The light has been kept on all the time until now; one × 60 watt tungsten



THE GARDEN POND IN AUTUMN

by Arthur Boarder

AUTUMN IS A VERY important time of the year for the pondkeeper. The cleaning out of the pond at this time may mean the difference between failure and success the following spring. During the year there is sure to be a great deal of mulm at the bottom of the pond, no matter how well it is stocked with water plants. It may surprise many people to notice how much waste matter can accumulate in a few months. If a lot of rotting matter is left in the pond throughout the winter, if a bad freeze up occurs, this will give off foul gases which can be trapped under the ice.

The trouble may not be apparent during the winter as the fishes will be almost dormant and will not need as much oxygen as when they are active. When spring comes and the water warms up the fishes become active and need more oxygen. This is the reason why many fish losses are noticed at this time.

The best time to clean out the pond is when most of the leaves from surrounding trees and shrubs have fallen. Some of these such as Laburnum are particularly dangerous. Any small or medium sized pond will benefit from a good clear out but a very large

one may be more than one can manage. If a fairly large pond is left for many years it will gradually silt up with all sorts of decaying matter and in time could become very shallow or even cease to exist as a pond at all. The emptying of the pond can be a big task if it is of a fair size and the help of a friendly aquarist will be appreciated. The pond can be emptied by using a water pump and this should be set going the first thing in the morning before breakfast. If the pond is at a higher level than the rest of the garden, it is possible to empty most of the water by siphoning it out with a hose. Place the end in the pond, not so deep that it can reach the mulm at the bottom, and run the rest of the hose to the lowest part of the garden. You do not have to suck at it to start a flow. Get a water can of water, hold the end of the hose as high as possible and pour water into it as much as it will take. Then quickly lay the end down and the water will start to run and continue to do so whilst this end is lower than the one in the pond.

Where to put the fish

As the water lowers it will be necessary to use a bucket to clear that which is left. As the pond is being emptied one can cut off as many dying water lily leaves as possible so that it will be easier to catch the fishes. It may be a problem as to what to do with the fishes during the clean out. It should be possible to do the task quite easily in one day even without help as long as one is organised before hand. One point must be borne in mind and that is not to try to keep the fishes in too small a container. With a fair number of medium sized fishes the bath is the safest place to keep them and the family will have to do without for a day.

When catching the fishes do not stir up the mulm from the bottom as this will make it so much more difficult to see them. As the water is lowered, the plants in containers can be drawn out of the pond. There may be a large amount of mulm adhering to the roots which have spread out and much of this can be hosed away. The plants will not suffer in any way for this can once it is in the pond again it comes to no harm. It is no use trying to rid the pond of decaying matter if a lot is left on all the plant roots.

When the fishes have been caught and the large water plants removed the mulm can be shifted. This will probably be a mass of black, evil-smelling matter which can be used as a mulch for garden plants. If the pond is of a liner construction, take care not to walk on it but treat it carefully. Flush out well with the hose and remove all dirty water. The pond can then be refilled and whilst this is taking place the water plants can have any attention needed. Most will need dead or dying leaves removed and long flower stalks can be cut down. Get the plants back in the pond before it is filled up again but do not be in a hurry to

replace the fishes. I usually found that by tea time the pond had been cleaned out and water being run in again. I then used to replace the fishes before dark but not before I had examined them all carefully to see that there were no pests on them. Do not subject the fishes to harsh treatment, I always handled the fishes and did not use a net to replace them. I have found that less damage is done to a fish with the hands than with a net.

Before any waterplants are returned to the pond, examine the roots to see that there are no pests around them such as leeches, larva of water beetles and dragon flies. Many pests may not be seen if on the bottom during the previous months and so it is a good plan to remove as many as possible whilst the pond is empty. The same will apply to water snails. Some pondkeepers think that the pond will not function properly without them, but this is a fallacy, they do no good and can do harm. When refilling the pond the water can be allowed to run over the top, as long as there is lower ground surrounding the pond. This will remove any film which may sometimes form.

Once the pond is refilled, do not start to feed the fishes. They may need very little more throughout the winter. If food is given and not eaten quickly, much of the good done by cleaning out the pond will have been in vain. From the end of October onwards, very little food need be given as the water will have cooled down and the fishes will have lost their appetites. During the winter, when there is a fairly mild spell, a few garden worms may be given now and then. The fishes may eat a little during cold weather but it takes them longer to digest it than when the water is warmer.

If it is not possible to clean out the pond in the late autumn, it certainly should be done in early spring. This is especially important if the pond has been frozen over for any length of time during the winter. The water usually gets very polluted when there is a cover of ice for some days. Even if the pond had been cleaned out before the winter it is always a good plan to change most of the water in March. If breeding is intended at such times then it is very important that the water is very well oxygenated, as no matter what conditions seem necessary to encourage a spawning, there is no doubt that fishes are not likely to breed unless the water is in good condition and contains plenty of oxygen. If the cleaning has been left until the spring, this is a good time to examine the water plants and to introduce any fresh ones which may be needed. If it is intended to add any more fish to the pond, do not attempt to do this until the fishes at the time in the pond, show that they are in good condition, which will in turn indicate that the pond water is also in good shape and it will be safe to introduce more fishes. Remember, however, that one must never try to have too many fishes in a small pond.

ASTROBLEPIDAE



- With Eyes Pointing To The Stars

by David Sands

ASTROBLEPUS gained recognition through the work of the great naturalist, Humboldt in 1806. At the turn of the century, Ichthyologists Regan, Steindachner and Eigenmann were involved in describing representatives of the genus. Eigenmann seemed most involved with them and published a part revision of the family in his 'Fishes of North Western South America' in 1922.

In the revision Eigenmann listed 17 species with a distribution over Colombia, Ecuador and the eastern slopes of the Andes, Peru. He described the members of Astroblepidae occurring in the torrential mountain streams up to an elevation of 13,400 feet, although enjoying a distribution at various intervals down to a few hundred feet below sea level. It is worth noting that they have even been found on the Atlantic slopes of the Andes where few fish have adapted to the tempest conditions.

The most complete of observations made of *Astroblepus* came from of all professions, a mining engineer. On 13th May 1912, a Mr. R. D. O. Johnson revealed his notes on the habits of a climbing catfish from Colombia (*Arges marmoratus*, Regan 1904 = *Astroblepus chotoe*, Regan 1904 synonymously published by Eigenmann 1922) to a meeting of the New York Academy of Sciences.

Johnson had completed several years in the highlands of Colombia and 'happened' upon these 'remarkable fishes.' He was referring to their remarkable

ability to climb the stone faces of high waterfalls and deep potholes. It was, in fact, in a pothole that Johnson observed the catfish.

The engineer described *A. chotoe* as follows "In external appearance the skin is smooth and scale-less, the colour is a dark mottled grey shading into a yellowish tint on the posterior parts. They rarely appear to grow beyond 12 in. and are considered excellent food by the natives who refer to them as 'capitan'".

Under usual stream conditions they prove clumsy and awkward swimmers wriggling through water like tadpoles, yet as creepers and climbers they are without rivals in the fish world.

The mouth is small, surrounded by a broad flap, thin and flexible at the edges. Its sucker mouth and under-belly muscles are so perfectly adapted that they have little difficulty attaching themselves to any convenient object. Under the skin of the ventral side, just behind the line joining the pectoral fins, there is a triangular bony plate to which are attached the ventral fins. The main anterior ribs of these fins are broad and flattened and the surfaces thickly studded with small sharp backward pointing serrations (Fig. 1).

The triangular plate and the attached fins are free to move in a longitudinal direction—a distance roughly 1/6th in the length of the fish. This movement is accomplished by means of four muscles in

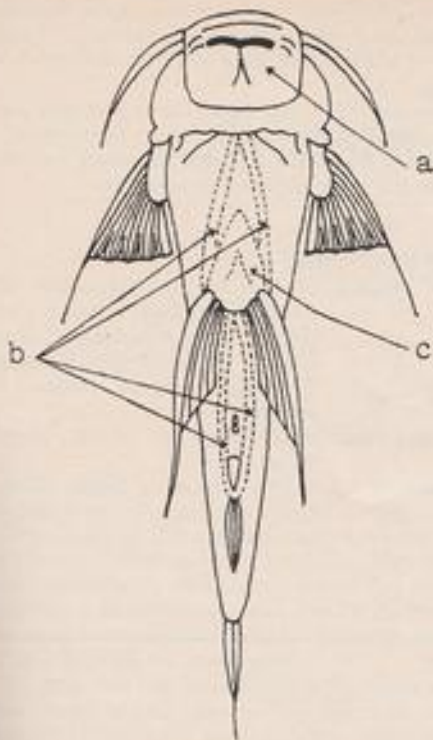


Fig. 1
a. mouth flap b. muscles
c. bony plate

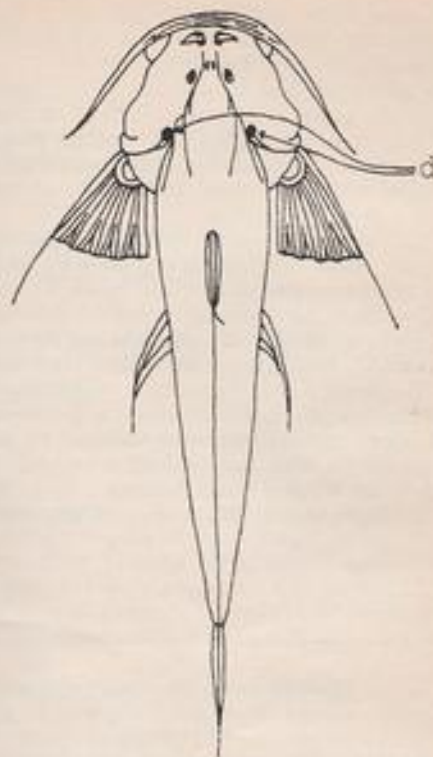


Fig. 2
d. orifices for the inflow
of water to gills



Fig. 3

two pairs attached to the plate. By the alternate action of the mouth the fish can move against a current of immense energy. Whilst the sucker mouth is attached to a rock or stone wall the mouth is closed. The gills must be supplied with an essential flow of water, so the necessary adaptation is present in the form of orifices, complete with inward opening valves below the gill slits. Water is drawn in through the orifice and passed out through the gill (Fig. 2). These fish survive in a habitat of the most turbulent kind and succeed not only in adapting to the turbulent waters, but even breeding in them.

Johnson found the fish after diverting a small stream to examine a deep pothole. Once the stream had been diverted he had the water, rock and gravel removed from the 22 foot deep pothole. When the water had been lowered to within a few feet the *Astroblepus* came into view.

The pothole had various diameters between 6-10 feet and was vertical with some sides inclined inwards. A small trickle of water still ran down one side of the pothole, up which many of the fish began to climb, allowing the water to wet the body from the mouth.

downwards. They 'hitched' themselves up a foot or so, then rested, waiting only a few minutes before they attempted the next foot (Fig. 3).

Once all the fish had managed an escape, Johnson measured the ascent to be 18 ft. Parts of the inward incline was at a 30° angle to the vertical and was coated in algae. He further observed eggs deposited in potholes which had been individually placed to the underside of large rocks.

The final part of this article belongs to Eigenmann, who in the winter of 1925 was travelling by train to Florida on what proved to be a vain search for health. He had much of his work, including the revision of the *Astroblepus* family with him, but somehow they were mislaid. Several years later, after Eigenmann's death, the missing papers turned up at the lost property office of the Baltimore and Ohio railway at Indianapolis.

The papers, rediscovered, were examined by Allen, an Ichthyologist who had himself completed field work in North Western South America. He published his findings together with the belated Eigenmann's

in 1942. This work increased the genus to almost 30 species, thus confirming they represent yet another interesting and variable wing to the Siluriforme order of catfish.

Representatives of the family have probably never been imported to this country which surely must be our loss for these catfish have obviously exploited a niche in the most inhospitable of worlds.

Literature cited:

- R. D. O. Johnson 1912 Notes on the habits of a climbing catfish (*Arges marmoratus* = *Astroblepus chotoe* Regan 1904) from Colombia. (Drawing adapted from this article).
- C. H. Eigenmann 1922 Fishes of North Western South America.
- Eigenmann & Allen 1942 Fishes of North Western South America.

UP-DATED, ENLARGED AND NOW, WITH COLOUR!

COLDWATER FISHKEEPING

by Arthur Boarder

More than 100 pages containing invaluable advice on every aspect of coldwater fishkeeping from one of the world's leading authorities.

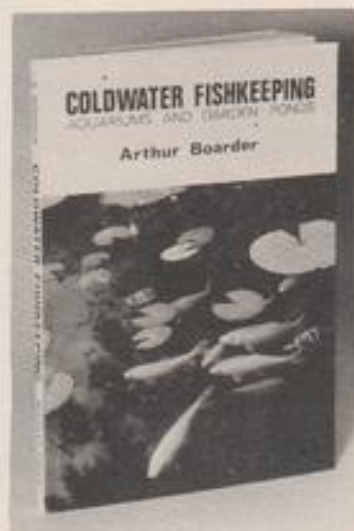
Printed on high quality paper with a most attractive Astralux cover, this fascinating book has dozens of illustrations and photographs including many in full colour.

A 'must' for every coldwater enthusiast

Price £1.50 (including post and packing)

Obtainable from:- **THE AQUARIST AND PONDKEEPER**
The Butts, Brentford, Middlesex TW8 8BN.

TRADE ENQUIRIES INVITED



Ancistrus dolichoptera

SOME NOTES ON BREEDING

by Peter A. Shannon

Introduction

AT THE outset of this report I must state that it was never my intention to breed these fish, only to create an environment in which they would feel at home. My purpose in obtaining them was in the hope that they would reduce the algae level in my aquarium and thus improve its appearance.

My tank has an established community of five rather large kissing Gouramies and one Red-tail Shark who have been together some twelve months. Even with these fish I had an algae problem, so in June 1978 I purchased two *Ancistrus dolichoptera* and one *Hypostomus* catfish all approximately 3 inches long. An interesting point is that with all this natural food my *Ancistrus dolichoptera* nearly doubled in size in three months, and as the other fish did not bother them they quickly settled.

First Spawning—Friday 29.9.78

At approximately 1800 hours my wife discovered several small fish cleaning the rocks and plants in our aquarium, and on closer examination we counted about 10 $\frac{1}{2}$ -inch long *Ancistrus* catfish at one end of the tank accompanied by the female. At the other end of the aquarium we saw the male in a cave with only the tip of his tail visible and surrounded by twenty to thirty young fish. I cannot be sure when they were born, but by observing the second spawning (which I shall describe later) I would estimate them to be about two to three weeks old. Their colours range from mid to dark brown, some being heavily speckled, others not, but the most obvious difference was size, the fish with the female were bigger and more independent than those with the male. Over the next twenty-four days the male was in constant supervision of the young fish in the cave, with only short periods away to feed, returning immediately if any other fish swam near the cave. The female

did not appear to show any interest in the male or the young fish with him and the young fish with her continued to progress at a quicker rate. During this period they began to eat fish meal and boiled spinach in addition to algae and at feeding times were seldom put off by the larger fish.

Second Spawning—Monday 23.10.78

The day began with both parents maintaining their usual positions but at approximately 1800 hours the female suddenly returned to the cave and proceeded to chase the male and young fish away, scattering them in all directions but always away from the cave. Then, in a fury of activity and aggression, she began to prepare the cave, moving plants and gravel and thoroughly upsetting the other fish. This burst of activity lasted for about thirty minutes until she entered the cave and finally settled, the male returned to a rock over the cave to observe her progress but did not give her any assistance.

For the next few days both fish maintained these positions, never leaving to feed, even though one of the feeding rings was close by. It was obvious that there was now a possibility of a second spawning but unfortunately we did not observe the actual mating. According to various sources both fish must have entered the cave to mate and this must have occurred at night, and with considerable difficulty as it seems impossible that both fish could fit into such a confined space.

On Friday 27.10.78 at approximately 1000 hours the female left the cave to feed and my wife took the opportunity of looking into the cave, and by shining a torch saw numerous eggs attached to the roof. Later that day another opportunity arose and she counted about twenty eggs of a whitish colour. During the next few days there was no change in the parents behaviour; the eggs, however,

began to gradually darken in colour and develop tails.

On Tuesday 31.10.78 we observed that some of the eggs had been removed from the cave and were now with the male. These eggs were well developed and 'mobile,' also when exposed to light (the torch) they were sensitive to it contracting and moving to avoid it. By Thursday 2.11.78 the eggs with the male had hatched, and that evening the parents changed position and at this point many of the first brood began to return to the cave but did not appear to harass the younger fish and the male did not seem averse to them. By Saturday 4.11.78 all the eggs had hatched and the female departed leaving the male in charge; he remained in or near the cave at all times, only leaving to feed. The only difference in behaviour between this spawning and the first was that the male lost interest after about ten days, this could have been due to either overcrowding in the cave or our interest in them, or there could have been some other unknown reason; however, none of the fish suffered as a result.

To date 2.4.79 all the young fish have survived and are thriving; they have cured the algae problem, but this is only to be expected with fifty to sixty young fish constantly devouring it.

We have not had a third spawning, and as this may be due to overcrowding. I am in the process of setting up a secondary tank to accommodate the young fish.

I am still puzzled by the movement of the eggs from the female to the male as there seemed to be no reason for it, and I am also left with one very intriguing question—will these tank-bred fish breed more easily than their wild counterparts?

General Information

Tank—is all glass holding 40 galls., the base is

covered by one eighth gravel, rockwork and plants which hide half the gravel. I have under gravel filters and aeration, and it is illuminated with a 40 watt Grolux tube for 15 hours a day.

Natural light—the tank receives natural light from a nearby window and sunlight fell directly on the cave for about 4 hours each day at the time of spawning.

Food—the basic diet is fish flake supplemented by freeze-dried *tubifex*, trout pellets and boiled spinach.

Water—I had two samples of water analysed, one before I cleaned out the tank and the other six hours after. It is my normal practice to replace nine gallons of water during cleaning, both samples were taken at 1700 hours.

First Sample prior to cleaning:

Temperature	76.2 Deg
pH	7.0
Conductivity μ S at 20 Deg C	2700
Chloride mg/l Cl	910
Alkalinity to m.o. mg/l Ca CO ₃	30
Ammonia mg/l Ca N	0.25
Nitrate mg/l Ca N	22
Sol. o-phosphate mg/l Ca P	10

Second Sample after cleaning:

Temperature	76.2 Deg
pH	6.9
Conductivity μ S at 20 Deg C	1800
Chloride mg/l Cl	576
Alkalinity to m.o. mg/l Ca CO ₃	30
Ammonia mg/l Ca N	0.5
Nitrate mg/l Ca N	10
Sol. o-phosphate mg/l Ca P	not available

Marine Queries *continued from page 32*

(4) Filtration

The vital importance of using an ultra-high-activity marine-grade charcoal has already been discussed above. The only other pre-requisite is a well-matured, very deep-bed undergravel filtration system utilizing both coral-sand and cockle-shell. External powerfilters are not practical in an octopus aquarium, not just because of the usual objections of high purchase/maintenance costs, indifferent nitrification characteristics, etc., etc., but because everytime I've tried a powerfilter in an octopus aquarium the octopus, invested as they all are with incredible intelligence

and strength, has eventually pulled off the inlet strainer and lost one or more vital parts of its anatomy inside the filter.

(5) Feeding

Octopuses will accept any kind of non-putrid crustacean/mollusc flesh. Ideally these foods will all be gamma-irradiated, kept in a deep-freeze and not have been subjected to repeated partial thawing and refreezing.

Caution: Octopuses are also partial to live crustaceans and molluscs and live coralfishes! Invertebrates other than the above are usually left unharmed and are ideal tank mates for an octopus.

BOOK REVIEW

Making your own Aquarium by Jørgen Hansen.
Translated by Pamela Stewart. Published by Bell
& Hyman Ltd., £5.50.

The names of Jørgen Hansen and Pamela Stewart are well known to regular readers of *The Aquarist*, for over a period of several years this talented couple have contributed jointly many informative articles on how to keep and breed readily available, and not so readily available, freshwater tropical aquarium fishes, with noticeable emphasis on the wondrously coloured and individualistic cichlids of the great lakes of Africa.

What a pleasure it is, therefore, to be able to recommend a book put together by two such competent aquarists for the enlightenment and guidance of the do-it-yourself enthusiast. The publishers state that, *Making your own Aquarium* is the first book to cover the construction of almost any shape or size of tank and fit it into all kinds of furniture and room settings.

In the first 20 pages the author deals lucidly with the construction of all-glass tanks and a combination of specially treated chipboard and glass. Mr. Hansen warns the ambitious reader that chipboard tanks are considerably more difficult to make than gluing five pieces of glass together. Nevertheless, the author makes it clear that the owner of a chipboard aquarium '... has a lovely sense of security through knowing that the tank consists of a wooden box lined with plastic [solution] and that the only vulnerable part ... is the front glass, which substitutes for one of the sides of the box.' Incidentally, chipboard fish tanks have proved popular overseas for a number of years; and for good reason. With chipboard of the right thickness to work with, it is possible to make really large tanks of some 4,000 litres or more.

Mr. Hansen devotes the next 23 pages of his book to the right way of placing, supporting and using

a tank or two as a decorative feature of a room as, for example, part of bookshelves, on metal brackets bolted to a wall, on strong wires suspended from a suitable ceiling, and so on and so on. A floor's bearing capacity, brick plinths, what makes an almost empty bookcase overturn at the slightest jolt and a well-filled bookcase stand firm as a rock, reducing noise from pumps, filters and fluorescent fittings are not glossed over in a few words but are given the attention they deserve. The baneful or beneficial effects of direct sunlight playing over a tank are gone into at some length. 'A few hours of direct sunlight will not harm a large tank (of over 80 litres) and will in fact be advantageous.' On the other hand, '... with many hours of sunlight per day the aquarium water in the course of a few days can be transformed to a liquid more reminiscent of green paint.' [Green pea soup would be nearer the mark]. On the subject of concrete moulded tanks Mr. Hansen observes: 'If you plan to build your own house, then you have here a splendid opportunity to fit in a large tank so that it forms a whole wall (if you are very keen).' This reviewer wonders if it is true that, '... not many serious aquarists would refuse a 10,000 litre tank if they had the opportunity and means of building one.' The remaining parts of the book deal with the community tank, the live-bearer tank, the cichlid tank, the African mouth-brooder tank, Angel fish and discus tanks, the breeding tank, heating and lighting, filters and pumps. These sections are helpful and stimulating to the imagination. The book is well illustrated with line drawings of tank layouts and furnishings. There are monochrome illustrations of a number of fishes in suitable aquarium environments. There are four fine reproductions of colour photographs of fishes. The bibliography could have been better. The index is marred by several mis-spellings of scientific names. The scientific names of some of the fishes stand for revision if a reprinting is called for.

JACK HEMS.



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

AT the first meeting in July of the **Walthamstow and District A.S.**, the annual auction took place. It gave the newer members a chance to buy good fish and plants and also boosted club funds. The second meeting consisted of an F.B.A.S. tape-slide lecture on International Aquaria, presented by Dr. David Ford.

AT the July meeting of the **Catfish Association Great Britain** the 50 members and guests were treated to a talk on Corydoras, Brochis and Apistogrammas. The talk was on identification, ecology (and location) and the hobbyist aspects. Of the many slides David Sands showed to illustrate his talk some were of the actual fish from which the different species are named (the holotypes). These slides were taken in Amsterdam by kind permission of Dr. Nijssen and Mr. Ibrucker.

AT the **King's Lynn A.S.** first open show, the encouraging interest shown by around 500 members of the public meant that it was an overall success. The trophy for best fish in show was won by M. Laws (King's Lynn), with a Lionhead cichlid. The special award presented by Mr. A. Ford, of Lynn Pets & Aquaria, for the member entering the most fish, was won by B. E. Towler with 24 entries.

Other results:—Barbs: 1, S. Dexter (Lynn); 2, G. Oiler (Lynn); 3, N. Harrowing (Lynn). Small characins: 1, M. Laws (Lynn); 2, A. Onslow (Loughborough); 3, Mrs. Ouzman (Lynn). Large characins: 1, A. Ford (Lynn); 2, B. Towler (Lynn); 3, R. Walden (Peterborough). Large cichlids: 1 and 3, M. Laws (Lynn); 2, J. Ouzman (Lynn). Angels: 1, B. Towler (Lynn); 2, T. Turner (Lynn). Dwarf cichlids: 1, J. Bowman (Lynn); 2, Mrs. Hayden (Lynn); 3, R. Ebbs (Lynn). Rift Valley cichlids: 1 and 3, M. Laws (K.L.A.S.); 2, B. Towler (K.L.A.S.). Labyrinth: 1 and 2, Mrs. Harmer (Norwich and D.A.S.); 3, R. Ceedy (Lynn). Killifish: 1 and 3, F. O'ray (Ipswich); 2, M. Laws (K.L.A.S.). Catfish: 1, A. Ford (K.L.A.S.); 2, B. Wright (K.L.A.S.); 3, C. Simper (K.L.A.S.). Corydoras and Brochis: 1, E. and N. Hallam (Loughborough); 2, A. Ford (Lynn); 3, C. Brakes (Peterborough). Rasboras: 1, E. Collins (Lynn); 2, N. Harrowing (Lynn). Loaches: 1 and 2, E. and N. Hallam (Loughborough); 3, C. Simper (Lynn). A.O.S. Tropical (egglayers): 1, J. Ouzman (Lynn); 2, B. Towler (Lynn); 3, T. Turner (Lynn). Pairs Tropical (egglayers): 1 and 3, R. Walden (Peterborough); 2, F. O'ray (Ipswich). Pairs Tropical (livebearers): 1, Mrs. Ouzman (Lynn); 2, B. Towler (Lynn); 3, R. Shinn (Lynn). Guppies (male): 1, 2 and 3, C. Brakes (Peterborough). Guppies (female): 1 and 2, B. Hayden (Lynn). Swords: 1, E. and N. Hallam (Loughborough). Platies: 1, E. and N. Hallam (Loughborough); 2, A. Ford (Lynn); 3, G. Oiler (Lynn). Mollies: 1, R. Ebbs (Lynn); A.O.S. Tropical (livebearers): 1, R. Walden (Peterborough); 2, F. O'ray (Ipswich); 3, A. Onslow (Loughborough). Singletail goldfish: 1, M. Hayden (Lynn). Twinstail goldfish: 1 and 2, S. Forrest (Newbury); 3, B. Towler (Lynn). Breeders class egg laying tropical: 1, F. O'ray (Ipswich). A.O.S. coldwater: 1 and 2, B. Towler (Lynn).

South Humberside A.S. Open Show. Results:—Guppies: 1, T. A. Tolhurst (Wyke);

2, D. Walker (G.C.A.S.); 3, Mr. and Mrs. Davis (S.H.A.S.). Platies: 1, W. Blundell (Doncaster); 2, Mr. and Mrs. Smith (Zenith); 3, Mr. and Mrs. Daines (Doncaster). Mollies: 1, Mr. and Mrs. Parish (Sherwood); 2, T. Stansfield (Sherwood); 3, D. and W. Jordan (S.H.A.S.). Swordtails: 1 and 3, Mr. Hawden (G.C.A.S.); 2, Mr. and Mrs. Smith (Zenith). A.O.V. Livebearers: 1, Miss L. Wilson (G.C.A.S.); 2, A. Onslow (Loughborough); 3, N. Walker (G.C.A.S.). Small Barbs: 1, Mr. and Mrs. J. Riley (L.P.O.); 2, Mr. and Mrs. Kemp (S.V.A.S.); 3, Mr. and Mrs. Kemp (S.V.A.S.). Large Barbs: 1 and 2, Mr. and Mrs. Kemp (S.V.A.S.); 3, A. Johnson (L.A.D.A.S.). Small Characins: 1 and 3, Mr. and Mrs. Lake (S.H.A.S.); 2, Mr. and Mrs. J. Riley (L.P.O.). Large Characins: 1 and 3, G. Betts (S.H.A.S.); 2, Mr. and Mrs. Lake (S.H.A.S.). Corydoras/Brochis: 1, Mr. Hawden (G.C.A.S.); 2, Mr. and Mrs. Copley (Doncaster); 3, Mrs. F. Wilson (G.C.A.S.). A.O.V. Cats: 1, T. Stansfield (Sherwood); 2, K. Fisher (Sherwood); 3, R. A. Bloomfield (Caistor). Small Anabantids: 1, Mr. and Mrs. Smith (Zenith); 2, Mr. and Mrs. Copley (Doncaster); 3, N. Walker (G.C.A.S.). Large Anabantids: 1, Mr. and Mrs. J. Riley (L.P.O.); 2, M. Tidwell (G.C.A.S.); 3, S. Oxborough (S.H.A.S.). Fighters: 1, Mr. and Mrs. J. Riley (L.P.O.); 2, Mr. and Mrs. Smith (Zenith); 3, Mr. and Mrs. Jackson (Sherwood). Dwarf Cichlids: 1, D. and W. Jordan (S.H.A.S.); 2, A. Johnson (L.A.D.A.S.). Mr. and Mrs. Pim (Doncaster). Rift Valley Cichlids: 1 and 2, M. A. Hollingsworth (Sherwood); 3, Mr. and Mrs. Smith (Zenith). A.O.V. Cichlids: 1, Miss J. E. Hollingsworth (Sherwood); 2, Mr. and Mrs. Hewitt (Zenith); 3, Mr. and Mrs. Lambie (Louth). Angels: 1, Mr. and Mrs. Drury (S.H.A.S.); 2 and 3, H. Preuser (Caistor). Livebearers A. and B.: 1, W. Blundell (Doncaster); 2, Mr. and Mrs. Tilling (Immingham); 3, T. Sands (Boston). Egglayers A. and B.: 1, Mr. and Mrs. Lambie (Louth). Livebearers C. and D.: 1, N. Walker (G.C.A.S.); 2, Mr. and Mrs. Copley (Doncaster). Damios/Minnows: 1, Mr. and Mrs. Lake (S.H.A.S.); 2, M. Lake (S.H.A.S.); 3, A. Frisby (Wyke). Rasboras: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Lake (S.H.A.S.); 3, M. Lake (S.H.A.S.). Pairs Livebearers: 1, H. Thorpe (Doncaster); 2, W. Blundell (Doncaster); 3, Mr. and Mrs. Tilling (Immingham). Pairs Egglayers: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Lake (S.H.A.S.); 3, L. Pickford (Caistor). Junior Livebearers: 1, Miss L. Wilson (G.C.A.S.); 2, Master R. Stansfield (Sherwood); 3, Miss A. Stansfield (Sherwood). Junior Egglayers: 1, S. Oxborough (S.H.A.S.); 2, M. Lake (S.H.A.S.); 3, T. H. Tolhurst (Wyke). Junior Swordtail: 1, T. H. Tolhurst (Wyke); 2, R. Stansfield (Sherwood); 3, N. Cooney (Zenith). Loaches/bottas: 1, Mr. and Mrs. Riley (L.P.O.); 2, Mr. and Mrs. Smith (Zenith); 3, Mr. and Mrs. Caldwell (S.M.A.S.). Killifish: 1, 2 and 3, R. Ranson (G.C.A.S.). A.O.V. Tropical: 1, Mr. and Mrs. Caldwell (S.M.A.S.); 2, T. A. Tolhurst (Wyke); 3, Mr. and Mrs. Kemp (S.V.A.S.). Marines: 1 and 2, Mr. and Mrs. Caldwell (S.M.A.S.); 3, S. Simpkins (Sherwood). Sharks/Foxes: 1, Mr. and Mrs. Drury (S.H.A.S.); 2, Mr. Tabor (Zenith); 3, H. Preuser (Caistor). A.V. Female Egglayer:

1, Mr. and Mrs. Copley (Doncaster); 2, Mrs. E. Stansfield (Sherwood); 3, R. Ranson (G.C.A.S.). A.V. Female Livebearer: 1, N. Walker (G.C.A.S.); 2 and 3, Mr. and Mrs. Tilling (Immingham). Goldfish and Comets: 1, A. Bellamy (Open); 2, B. Codrington (Open). Shubunkins and Fancy Goldfish: 1, Miss L. Wilson (G.C.A.S.); 2, P. Spencer (G.C.A.S.); 3, M. Parish (Sherwood). A.O.V. Coldwater: 1, Mr. and Mrs. J. Riley (L.P.O.); 2, D. McLoughlin (G.C.A.S.); 3, D. and W. Jordan (S.H.A.S.).

350 entries were benched at the **Romford and Beacontree A.S.** open show. The Best fish in Show was a Hypostomus Punctatus owned by Mr. P. Lambert (Romford). Best Cichlid: J. London (Southend). The Highest Pointed Club Cup was won by the Independent A.S. with 43 points.

Class Ag: 1, J. Risk (Romford); 2, F. Victory (Romford); 3, R. Perry (Romford). B: 1, 2 and 4, Mr. and Mrs. Carney (Independent); 3, G. Steptow (Romford). C: 1 and 3, P. Riley (Bethnal Green); 2 and 4, J. Adams (Romford). D: 1, J. London (Southend); 2, W. Hastings (S.E. London); 3, J. Part (Romford). Db: 1 and 2, P. Hines (Romford); 3, A. Chapman (E.L.A.P.A.). Dc: 1, G. Steptow (Romford); 2, J. Part (Romford); 3, G. Moore (Romford). E: 1, P. Riley (Bethnal Green); 2, S. Webb (Harlow); 3 and 4, D. J. Wood (E.L.A.P.A.). Ea: 1, 2, 3 and 4, Mr. and Mrs. Carney (Independent). F: 1, R. C. Smith (Romford); 2, J. E. Myres (Ilford). G: 1, P. Lambert (Romford); 2, J. Carney (Independent); 3, Mr. and Mrs. Carney (Independent). H: 1 and 2, T. Allen (Romford); 3, G. Steptow (Romford). J: 1 and 3, G. Steptow (Romford); 2, W. Hastings (S.E. London). K: 1 and 2, J. Part (Romford); 3, Mr. and Mrs. Carney (Independent). L: 1, Mr. and Mrs. Carney (Independent); 2 and 3, P. Hines (Romford). M: 1, J. London (Southend); 2 and 4, Mr. and Mrs. Carney (Independent); 3, J. Risk (Romford). NBM: 1, R. C. Smith (Romford); 2, G. Steptow (Romford); 3, J. Risk (Romford). NO/T: 1, B. Ward (Romford); 2 and 3, S. Webb (Harlow). O: 1, T. Allen (Romford); 2, P. J. Doe (Ilford). P: 1, A. Chapman (E.L.A.P.A.); M. Lambert (Romford); 3, B. Ward (Romford). Q: 1, 2 and 4, Mr. and Mrs. Carney (Independent); 3, E. Ward (Romford). R: 1, 3 and 4, S. Buck (Romford); 2, J. London (Southend). S: 1 and 4, Mr. and Mrs. Carney (Independent); 2, A. Chapman (E.L.A.P.A.); 3, P. J. Doe (Ilford). T: 1 and 2, J. E. Myres (Ilford); 3, B. Compton (Romford). U: 1, B. Compton (Romford); 2, G. Steptow (Romford). W: 1 and 2, B. Compton (Romford); 3, P. Howe (Romford). X.B.M.: 1, R. C. Smith (Romford); 2, G. Steptow (Romford); 3, S. Webb (Harlow). X.O.T.: 1 and 3, E. Ward (Romford). Z: 1, A. Waller (E.L.A.P.A.); 2, B. Compton (Romford); 3, D. Byfield (Romford). Junior Tropical: 1, M. Allen (Romford); 2, D. Woodhams (Independent); 3, Y. Steptow (Romford). Junior Coldwater: 1, M. Allen (Romford); 2, Y. Steptow (Romford); 3, A. Waller (E.L.A.P.A.).

AT the August meeting of **Malvern and District A.S.**, members were given a most entertaining and interesting lecture by Mr. M. Darby on collecting and keeping native marines. The talk was illustrated with live marine creatures from his own tanks. Newcomers are always welcome at our meetings on 1st Monday of each month at St. Josephs School Hall, Newtown Road, Malvern.

AT the August meeting of the **Mid Sussex A.S.**, the monthly draw for the '50' club was won by Mr. Pinney, Mr. T. Short and Mrs. Y. Perrin. Afterwards, members were entertained by a tape-slide show on Koi, from the F.B.A.S.

It was pointed out to members that in the future meetings will start at 8 p.m., and all benching should be finished by this time. Slides which were taken by two of the members at the Interclub held on 3rd June were then shown. Any ideas or suggestions for next years Interclub, to be held on 1st June, would

be gratefully accepted.

There were no entries in the Killifish class for the table show. Livebearers class: 1, E. and T. Tester, 2 and 4, P. Levine; 3, J. Maddocks. Thanks to Mr. C. Pannell of Hastings for judging.

Anyone interested in finding out more about the society, please contact the secretary, Mr. J. Birch, 11a Sandrocks Way, Haywards Heath (phone: H. Heath 59585); or come to a meeting, held on the second Thursday of each month at Oakley Lodge, Oakley Lane, Keymer, 8 p.m.

Reigate and Redhill A.S. thank all who participated in their open show, in particular the judges, Jim Carney, Derek Durrant, Ron Forder, Derek Lambourne, Jack Stillwell, Alan Wearie and Colin Wood. Best Fish in Show was won by John Edwards, of Thaxet A.S., and the Ladies Plate was won by Marion Creasey of Reigate and Redhill A.S. Results—Class Ag: 1, R. Hard (Brighton); 2, Mr. Raggio (Brighton); 3, T. Ramshaw (Brighton); 4, M. Bourne (S.E. London); 5, T. Ramshaw (Brighton). Ba: 1, C. Fenniss (Strood); 2 and 3, H. and T. Tester (Brighton). C: 1, M. Wear (Kingston); 2, M. Creasey (Reigate); 3, P. Levine (Mid-Sussex). Ca: 1, B. Sayers (Brighton); 2, P. Edwards (Thames); 3, D. Mackay (Kingston). D: 1, T. Ellis (Brighton); 2, Mr. Parr (Romford); 3, J. Payne (S.E. London). Db: 1, A. Feast (Tonbridge); 2, A. Fuller (Kingston); 3, A. Feast (Tonbridge). Dc: 1, E. and T. Tester (Brighton); 2, Mr. Parr (Romford); 3, Mr. and Mrs. Smith (Brighton). E: 1, R. Goucher (Brighton); 2, C. Fenniss (Strood); 3, P. Levine (Mid-Sussex). Ea: 1 and 2, N. Woolley (Brighton); 3, C. Osbourne (S.E. London). F: 1, R. Thoday (Witham); 2 and 3, Mr. Johnson (S.E. London). G: 1, Mr. Johnson (S.E. London); 2, Mr. Parr (Romford); 3, M. Sandford (Reigate). Ga: 1 and 2, P. Miller (C.A.G.B.); 3, T. Woolley (S.L.A.G.). H: 1, J. Carpenter (Hounslow); 2 and 3, D. Mackay (Kingston). I: 1, Mr. Raggio (Brighton); 2, M. Bourne (S.E. London); 3, P. Levine (Mid-Sussex). K: 1, Mr. Parr (Romford); 2, T. Ramshaw (Brighton); 3, Mr. Johnson (S.E. London). L: 1, R. Thoday (Witham); 2, J. Carpenter (Hounslow); 3, R. Thoday (Witham). M: 1, A. Feast (Tonbridge); 2, T. Ramshaw (Brighton); 3, D. and P. Lambert (Kingston). Nb-m: 1, R. Thoday (Witham); 2, Mr. Johnson (S.E. London); 3, C. Osbourne (S.E. London). No-t: 1, T. Ramshaw (Brighton); 2 and 3, D. Cheswright (Southend). O: 1, V. A. Feast (Tonbridge); 2 and 3, F. J. Holding (Brighton). P: 1, Mr. Parr (Romford); 2, F. J. Holding (Walthamstow); 3, Mr. and Mrs. Jackson (Hastings). Q: 1 and 2, Mr. Meech (Witham); 3, C. Fenniss (Strood). R: 1, B. Sayers (Brighton); 2 and 3, F. J. Holding (Walthamstow). S: 1, M. Bourne (S.E. London); 2, C. Bird (Strood); 3, S. Smith (Brighton). T: 1, J. Edwards (Thames); 2, T. Ramshaw (Brighton); 3, B. Sayers (Brighton). U: 1, D. Mackay (Kingston); 2 and 3, Mr. and Mrs. Smith (Brighton). V: 1 and 2, J. Pollard (Kingston). W: 1, T. and T. Rushbrooke (Reading); 2, T. Woolley (S.L.A.G.). Xb-m: 1, P. Miller (C.A.G.B.); 2 and 3, R. Hard (Brighton). Xo-t: 1, D. Cheswright (Southend); 2, T. Ramshaw (Brighton); 3, D. Cheswright (Southend). Z: 1, P. Rushbrooke (Reading); 2, Mr. Meech (Witham); 3, M. Creasey (Reigate).

RESULTS of the Blackpool and Fylde A.S. open show—Common Goldfish and Corners: 1, B. Frost (Fleetwood); 2, L. Pountain (Runcorn); 3, T. Dean (Fleetwood). Shubunkins: 1, B. Frost (Fleetwood); 2 and 3, Mr. Downie (Sandgrounders). A.O.V. Coldwater Single Tail: 1, R. Hain (Blackpool); 2, C. Mason (Longridge); 3, B. Frost (Fleetwood). Veiltails, Oscars and Mozars: 1, T. Dean (Fleetwood); 2, Mrs. Dean (Blackpool); 3, B. Frost (Fleetwood). Lionheads and Orandas: 1 and 3, E. Hill (Fleetwood); 2, T. Dean (Fleetwood). A.O.V. Fancy Goldfish (not listed): 1, T. Kenyon (Blackpool); 2, G. Kenyon (Blackpool); 3, J. Kenyon (Blackpool). Swordtails: 1 and 3, M. and J. Bradshaw (Longridge); 2, B.

Frost (Fleetwood). Platies: 1, B. and J. Durham (Longridge); 2, M. and J. Bradshaw (Longridge); 3, B. W. Carter (St. Helens). Mollies: 1, J. Roberts (Nelson); 2, M. N. Rimmer (Sandgrounders). Guppies: 1 and 3, T. Dean (Fleetwood); 2, B. Frost (Fleetwood). A.O.V. Livebearers: 1 and 2, P. Harris (St. Helens); 3, Mr. and Mrs. B. Walsh (Darwen). Characins (Small): 1 and 2, Mr. and Mrs. B. Walsh (Darwen); 3, Mr. and Mrs. Baldwin (Characins (Large): 1, 2 and 3, Mr. and Mrs. B. Walsh (Anabantids (Small): 1 and 3, P. Harris (St. Helens); 2, J. Roberts (Nelson). Anabantids (Large): 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, A. Cooke (Blackpool); 3, J. Davidson (Hyde). Fighters: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, A. Cooke (Blackpool); 3, B. W. Carter (St. Helens). Minnows: 1, Wallbank and North (Morecambe); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, T. L. Penny (St. Helens). Danios: 1, A. Hamlet (Northwich); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Wallbank and North (Morecambe). Rasboras: 1, B. Kenyon (Blackpool); 2, Mr. and Mrs. B. Walsh (Darwen); 3, Mr. and Mrs. Baldwin (Sandgrounders). Laboon-Sharks-Foxes: 1, Wallbank and North (Morecambe); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, B. Frost (Fleetwood). Barbs (Small): 1 and 3, P. Kenyon (Sandgrounders); 2, B. W. Carter (St. Helens). Barbs (Large): 1, Mrs. N. Mellor (Blackpool); 2, P. Kenyon (Sandgrounders); 3, Mr. and Mrs. Baldwin (Sandgrounders). Toothcarps: 1, A. Hamlet (Northwich); 2 and 3, J. Roberts (Nelson). Dwarf Cichlids: 1, D. Moseley (Fleetwood); 2, R. Gardner (Ind.); 3, M. Allison (Sandgrounders). Large Cichlids: 1, Mrs. K. Smith (Blackpool); 2 and 3, Mrs. W. Kenyon (Blackpool). Rift Valley: 1, Wallbank and North (Morecambe); 2, P. H. Bachelor (Loyne); 3, G. Wright (Blackpool). Angels: 1, D. Garstang (Longridge); 2, L. Pountain (Runcorn). Corydoras: 1, B. W. Carter (St. Helens); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, B. and J. Durham (Longridge). A.O.V. Catfish: 1, P. and H. Bachelor (Loyne); 2, P. Kenyon (Sandgrounders); 3, Mr. and Mrs. Baldwin (Sandgrounders). Loaches and Botia: 1, Wallbank and North (Morecambe); 2, D. and G. Moseley (Fleetwood); 3, Mr. and Mrs. Baldwin (Sandgrounders). A.O.V. Tropical (not listed): 1, C. and M. Wadman (Darwen); 2, P. and H. Bachelor (Loyne); 3, Mr. and Mrs. Baldwin (Sandgrounders). Marines: 1, G. Lawless (Leigh). Pairs Livebearers: 1 and 2, B. W. Carter (St. Helens); 3, T. L. Penny (St. Helens). Pairs Egglayers: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, J. Roberts (Nelson); 3, B. and J. Durham (Longridge). Breeders Livebearers: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. B. Walsh; 3, G. Lawless (Leigh). Breeders Egglayers: 1, B. Kenyon (Blackpool). Breeders Egglayers Easy: 1, 2 and 3, D. and G. Moseley (Fleetwood). A.V. Livebearers: 1, S. Ralton (Loyne); 2, M. Allison (Sandgrounders); 3, M. and N. Bradshaw (Longridge). A.V. Egglayer: 1, Miss J. Baldwin (Sandgrounders); 2, D. Garstang (Longridge); 3, P. Ralton (Loyne). Best in Show: B. W. Carter (St. Helens). Best Fish Shows by Lady: K. Smith (Blackpool).

THE results of the Three Rivers Fishkeeping Exhibition, held at Crowtree Leisure Centre, Sunderland, Tyne and Wear were—Class A: Furnished aquaria: 1, Dalkeith; 2, Throckley; 3, Sunderland. Ba: Barbs: 1, Killingsworth; 2, Redcar; 3, Houghton Le Spring. B: Barbs: 1 and 4, Novos; 2, Middlesbrough; 3, Throckley. Ca-b: 1, Caer Urfu; 2, Houghton Le Spring; 3, South Shields. C: 1, Novos; 2, Caer Urfu; 3, Mount Pleasant. Da: 1, Redcar; 2, Houghton Le Spring; 3, South Shields. Db: 1, Mount Pleasant; 2, Caer Urfu; 3, Middlesbrough. Dc: 1 and 2, South Shields; 3, Caer Urfu. Dd: 1, Dalkeith; 2, Novos; 3, Killingsworth. Ea: 1, Blyth; 2, Caer Urfu; 3, Novos. E: 1, Caer Urfu; 2, Redcar; 3, Throckley. F: 1, Novos; 2, Caer Urfu; 3, Throckley. G: 1, Dalkeith; 2, Redcar; 3, Novos. H: 1 and 4, Dalkeith; 2, Novos; 3, Throckley. J: 1, Caer Urfu; 2, Sunderland; 3, Novos. K: 1, Caer Urfu;

2, Houghton Le Spring; 3, Blyth. L: 1, Caer Urfu; 2 and 3, Throckley. Ma: 1, Caer Urfu; 2, Throckley; 3, Boldon. M: 1, Novos; 2, Caer Urfu; 3, Dalkeith. O: 1, 2, 3 and 4, FGA. P: 1, 2, 3 and 4, FGA. Q: 1, Mount Pleasant; 2, Throckley; 3, Newcastle Guppy L.S. R: 1, Novos; 2, Throckley; 3, Mount Pleasant. S: 1, Novos; 2, Caer Urfu. T: 1 and 4, Newcastle Guppy L.S.; 2, Caer Urfu; 3, South Shields. U: 1, Redcar; 2, Mount Pleasant; 3, Houghton Le Spring. V: 1, Boldon; 2, Houghton Le Spring; 3, Mount Pleasant. W: 1 and 2, Novos; 3, Throckley. Xb-m: 1 and 3, Novos; 2, Dalkeith. Not: 1, Throckley; 2, Mount Pleasant; 3 and 4, Newcastle Guppy L.S. Xbm: 1, Caer Urfu; 2, Novos; 3, Redcar. Not: 1, Newcastle Guppy L.S.; 2, Mount Pleasant; 3, P.G.A. The Big, Bad and the Ugly class was won by a Koi carp, owned by Mrs. Connie Low, 2, for a Snakehead, owned by Mr. George Liddle; 3, with a Leposobarbus boevens, owned by Mr. Terry Marshall. 'Best Tableaux' results were—1, Dalkeith; 2, Redcar; 3, Caer Urfu. 'Best Stand' results: 1, Throckley; 2, Mount Pleasant; 3, Houghton Le Spring. The 'Best Fish in Show' was a Brachyrrhynchus imitator (78 pts) owned by R. Morton from Dalkeith A.S. The 'Best Society' was won by Novos T.F.C., followed respectively by Caer Urfu, Throckley and Mount Pleasant. 'Best Exhibitor' was won by Mr. and Mrs. Imbleton of Novos T.F.C.

THE Yorkshire Aquarist Festival results: Tableaux: 1, Bridlington "Penny Arcade"; 2, York "Fish House"; 3, Castleford "Box of Chocolates"; 4, Duffries "Water Bed"; 5, Chesterfield "Discus A Go-Go". Fish of Fishes: 1, R. Brown (Morley); 2, M. Laws (King's Lynn); 3, A. Frinby (Wyke). Furnished Aquarium (Society entry): 1, Sheaf Valley; 2, Hull; 3, Doncaster. Furnished Aquarium (Individual entry): 1, Mr. and Mrs. Bower (Sheaf Valley); 2, Mrs. M. Wood (Chesterfield); 3, L. Armstrong (Duffries). Coldwater Furnished Aquarium (Individual): 1, J. Hall (Aireborough); 2, D. Harris (Mexborough). Marine Furnished Aquarium (Individual): 1, T. Hewson (Hull). Aquascape (Individual): 1, A. Chapman (Mexborough). Novelty (Individual): 1, B. Wigley (Mexborough); 2, J. Goucher (Goole); 3, A. Bryan (Sherwood). Guppies: 1, Mr. and Mrs. Lunn (Barnsley); 2, Mrs. Hooley (Fishkeepers); 3, T. Stanfield (Sherwood). Platies: 1, Mr. and Mrs. Lee (Chesterfield); 2, L. Ward (Bridlington); 3, W. Blundell (Doncaster). Mollies: 1, T. Stanfield (Sherwood); 2, M. Shipley (Goole); 3, K. Taylor (Hull). Swordtails: 1, Mrs. H. Blades (Fishkeepers); 2, M. Jordan (Bridlington); 3, E. Whitham (Tower). A.O.V. Livebearers: 1, T. and P. Bantfield (Barnsley); 2, F. and S. Whitehouse (Wolverhampton); 3, K. Pendergast (Boston). Small Barbs: 1, A. Marples (Sherwood); 2, D. Sugden (Bradford); 3, Mr. and Mrs. Waller (Chesterfield). Large Barbs: 1, Mr. and Mrs. Kemp (Sheaf Valley); 2, P. Burrows (Hull); 3, Mr. and Mrs. Golland (Sheaf Valley). Small Characins: 1, Mrs. Hooley (Fishkeepers); 2, Mr. Buckley (Fishkeepers); 3, Mr. and Mrs. M. Hill (Scunthorpe Museum). Large Characins: 1, B. Sleight (Mexborough); 2, F. and S. Whitehouse (Wolverhampton); 3, K. Fletcher (Chesterfield). Rasboras: 1, K. Chapman (Mexborough); 2, D. Foyter (Fishkeepers); 3, H. Ackroyd (Doncaster). Danios: 1, D. Harris (Mexborough). Minnows: 1 and 2, J. Bizzard (Sheffield). Egg-laying Toothcarps (Top and Switch Spawners): 1 and 2, Mr. Buckley (Fishkeepers); 3, Mr. and Mrs. Wright (Barnsley). Egg-laying Toothcarps (Bottom Spawners): 1, Mrs. H. Blades (Fishkeepers); 2, B. Sleight (Mexborough); 3, B. Wigley (Mexborough). Siamese Fighters (True Strains): 1, Mr. and Mrs. Lee (Chesterfield); 2 and 3, Mrs. Grey (Hull). Siamese Fighters (Multicolours): 1, Mrs. Grey (Hull); 2, G. Moertmer (Bridlington); 3, Mr. and Mrs. Wainwright (Fishkeepers). Small Anabantids: 1, P. Griffiths (Mexborough); 2, M. and L. Price (Gawthorpe); 3, A. D. Fisher (Headford). Large Anabantids: 1, P. Shipley (Goole); 2, F. and S. Whitehouse (Wolverhampton); 3, P. Griffiths (Mexborough).

Dwarf Cichlids: 1, D. Lacy (Fishkeepers); 2, M. and L. Price (Castleford); 3, B. Isaacs (Bradford). Rift Valley Cichlids: 1, T. Reid (Fishkeepers); 2, M. and L. Price (Castleford); 3, F. and S. Whitehouse (Wolverhampton). Angels: 1, D. Harris (Mexborough); 2, A. and P. Barker (York); 3, Mr. and Mrs. Porritt (Doncaster). A.O.V. Cichlids: 1, Mr. and Mrs. Barlow (Sheaf Valley); 2, Mr. and Mrs. Wainwright (Fishkeepers); 3, J. Cawthorne (Widlington). Corydoras and Brochis: 1, F. and S. Whitehouse (Wolverhampton); 2, Mr. Buckley (Fishkeepers); 3, R. Stansfield (Sherwood). A.O.V. Catfish: 1, T. Stansfield (Sherwood); 2, B. Sleight (Mexborough); 3, T. and M. Kirby (Goole). Botias and Loaches: 1, Mr. and Mrs. D. Caldwell (Scunthorpe Museum); 2, M. and L. Price (Castleford); 3, Mrs. H. Blades (Fishkeepers). Sharks: 1, M. Collier (Goole); 2, D. Dennis (Bridlington); 3, D. Lacy (Fishkeepers). Foxes: 1, A. M. Shaw (York); 2, D. Suggen (Bradford); 3, M. and L. Price (Castleford). Pairs Livebearers: 1 and 2, T. and P. Busfield (Barnsley); 3, F. and S. Whitehouse (Wolverhampton). Pairs Egglayers: 1, D. Kidd (Wolverhampton); 2, Mrs. Kemp and Mrs. Golland (Sheaf Valley); 3, I. Taylor (Bridlington). Breeders (Live) A and B: 1, W. Blundell (Doncaster); 2, T. Smith (Bridlington); 3, A. Hopkinson (Darfield). Breeders (Live) C and D: 1, T. and P. Busfield (Barnsley); 2, A. Hopkinson (Darfield); 3, Mr. and Mrs. Hill (Barnsley). Breeders (Egg) A and B: 1 and 2, Mr. and Mrs. Waller (Chesterfield); 3, P. Griffiths (Mexborough). Breeders (Egg) C and D: 1 and 2, G. Collier (Goole); 3, J. Simmonite (Doncaster). A.V. Female (Livebearer): 1 and 2, T. and P. Busfield (Barnsley); 3, K. Prendergast (Boston). A.V. Female (Egglayer): 1, D. A. Whitehouse (Wolverhampton); 2, Mr. and Mrs. Golland (Sheaf Valley); 3, Mrs. H. Stansfield (Sherwood). A.O.V. Tropical: 1, Pete and Sylvia (Bridlington); 2, P. Hutton (Goole); 3, Mr. and Mrs. Wainwright (Fishkeepers). Tropical Marines: 1, D. Lacy (Fishkeepers); 2, S. Simkiss (Sherwood); 3, Mr. and Mrs. D. Caldwell (Scunthorpe Museum). Common Goldfish and Comets: 1, K. Chapman (Mexborough); 2, A. D. Fisher (Bradford); 3, Mr. and Mrs. Waller (Chesterfield). Shubunkins (Bristol and London): 1, J. Scarle (Goole); 2 and 3, I. Hall (Aireborough). Fancy Goldfish (Moors, Fantails, Orandas, Lionheads): 1, J. Scarle (Goole); 2, Mrs. E. Hall (Aireborough); 3, S. Hall (Aireborough). Breeders (Coldwater): 1, Mr. and Mrs. Waller (Chesterfield). A.O.V. (Coldwater): 1, D. Harris (Mexborough); 2, Mr. and Mrs. Hill (Barnsley); 3, K. and M. Wood (York). Aquarium Plants: 1, Mr. and Mrs. Golland (Sheaf Valley); 2, Mr. and Mrs. Fletcher (Doncaster); 3, B. Wigley (Mexborough). Amphibians (Crabs, Lobsters, Terrapins, Shrimps): 1, Mrs. H. Blades (Fishkeepers); 2, Pete and Sylvia (Bridlington); 3, T. and P. Busfield (Barnsley). Best Fish in Show: B. Sleight (Mexborough). Best Exhibit: B. Wigley (Mexborough). Highest Pointed Society: Fishkeepers.

RESULTS of Grimby and Cleethorpes Open Show:—Best Fish in Show, Miss J. E. Hollingworth. Best Society, South Humber-side. Section 1 Livebearers—Section winner, T. and P. Busfield. Guppies: 1, Mr. and Mrs. Davies; 2, D. Barrett; 3, T. Tolhurst. Swordtails: 1, Miss T. Tolhurst; 2, R. Gee; 3, A. Smart. Mollies: 1, Mr. and Mrs. Pariah; 2, Mr. and Mrs. Hancock; 3, Mr. and Mrs. T. Tidwell. Platies: 1, G. Clark; 2, D. Barrett; 3, A. Marples. A.O.V. Livebearer: 1 and 2, T. and P. Busfield; 3, L. Wilson. Section 2 Barbs—Section winner, A. Marples. Sm barb: 1, A. Marples; 2, Mr. and Mrs. Smith; 3, Mr. and Mrs. Kemp. Lge Barb: 1, Mr. and Mrs. Kemp; 2, A. Johnson; 3, A. Marples. Section 3 Characins—Section winner, Mr. and Mrs. Lake. Sm Characina: 1 and 3, Mr. and Mrs. Lake; 2, R. and S. Cherryholme. Lge Characins: 1, Mr. and Mrs. Smith; 2, Mr. and Mrs. Lake; 3, C. Sargent. Section 4 Cichlids—Section winner, M. A. Hollingworth. Dwarf Cichlid: 1, A. Johnson; 2, B. Banks; 3, Mr. and Mrs. Ashton. Lge Cichlid: 1, Mr. and Mrs.

Barlow; 2, S. Harrison; 3, Mr. and Mrs. Lambie. Angels: 1, H. Preuser; 2, H. Tolhurst; 3, Mr. and Mrs. Smith. Rift Valley: 1 and 3, M. A. Hollingworth; 2, A. Frisby. Section 5 Catfish—Section winner, J. Hawdon. Corydoras and Brochis: 1, J. Hawdon; 2, G. Clark; 3, L. Pickford. A.O.V. Catfish: 1, Mr. and Mrs. Hancock; 2, A. Frisby; 3, T. Wright. Section 6 Loaches and Botias—Section winner, Mr. and Mrs. Barlow. Loaches and Botias: 1 and 3, Mr. and Mrs. Barlow; 2, Mr. and Mrs. D. Caldwell. Section 7 Sharks and Foxes—Section winner, A. Piggett. Sharks and Foxes: 1, A. Piggett; 2, C. Harris; 3, Mr. Fisher. Section 8 Anabantids—Section winner, R. and S. Cherryholme. Sm Anabantids: 1, R. and S. Cherryholme; 2, S. Oxborough; 3, Mr. and Mrs. Smith. Siamese: 1, Mr. and Mrs. Chester; 2, B. Lough; 3, L. Pickford. Lge anabantids: 1, K. Lancashire; 2, S. Harrison; 3, S. Oxborough. Section 9 Coldwater—Section winner, Mr. Simpkins. Goldfish and comets: 1, Mr. and Mrs. Garrard; 2, Mr. and Mrs. Waller; 3, E. Ashton. Shubunkins and fancy goldfish: 1, Mr. Miller; 2, Mr. and Mrs. Waller; 3, L. Wilson. A.O.V. Coldwater: 1, Mr. Simpkins; 2, E. Lough; 3, Mr. and Mrs. Garrard. Section 10 Killifish—Section winner, R. Ranson. Top and switch spawners: 1, 2 and 3, R. Ranson. Section 11 Rasboas, Danios and Minnows—Section winner, Mr. and Mrs. Chester. Danios and minnows: 1 and 2, Mr. and Mrs. Lake; 3, Mr. and Mrs. Smith. Rasboas: 1, Mr. and Mrs. Chester; 2 and 3, Mr. and Mrs. Lake. Section 12 A.O.V. Tropical and Marines—A.O.V. Tropical: 1, T. Tolhurst (Section winner); 2, Mr. and Mrs. Kemp; 3, Mr. and Mrs. Caldwell. Marines: 1, Mr. and Mrs. Caldwell (Section winner); 2, Mr. Cant; 3, Mr. and Mrs. D. Caldwell. Section 13 True Pairs—Section winner, T. and P. Busfield. Pairs Egglayers: 1, D. Moody; 2, Mr. and Mrs. Lake; 3, L. Pickford. Pairs Livebearers: 1, 2 and 3, T. and P. Busfield. Section 14 Novices—Section winner, Miss S. Lambie. Novices: 1, Miss S. Lambie; 2, M. N. Hollingworth; 3, Mrs. Marples. Section 15 Breeders—Section winner, Mr. and Mrs. Chester. Breeders Egg (A. and B.): 1, Mr. and Mrs. Waller; 2, R. Lancashire; 3, A. Smart. Breeders Egg (C. and D.): 1, Mr. and Mrs. Chester; 2, G. Clark; 3, B. Banks. Breeders Live (A. and B.): 1, B. Boerill; 2, Mr. and Mrs. Jackson; 3, A. Smart. Breeders Live (C. and D.): 1, B. Banks; 2, N. Walker; 3, T. and P. Busfield. Section 16 Junior—Section winner, Miss J. E. Hollingworth. Junior: 1, Miss J. E. Hollingworth; 2, S. Oxborough; 3, A. Dudding.

THE August meeting of the Evesham Fishkeepers' Society were pleased to welcome D. J. Kaufman, Chairman of Malvern & District Aquarist Society, who gave a very informative talk on "Water Chemistry in the Aquarium." He was able to show members the most up-to-date kits for testing both Dh and Ph factors.

Mr. Kaufman kindly judged the table show which featured Goldfish and A.O.V. Coldwater fish. Results: Goldfish: 1, Mrs. E. Thornton; 2 and 3, S. Biddle; 4, Mrs. A. Biddle. A.O.V. Coldwater: 1, D. R. Goll; 2, Mrs. E. Thornton; 3, S. Biddle.

The Society meets on the first Wednesday of every month at 8 p.m. at the Hampton Scout Hut, Pershore Road, Evesham, Wocs. Visitors and new members welcomed. Secretary: Mr. M. Barnett, 14 Meadow Road, South Littleton, Nr. Evesham, Wocs. (Tel: Evesham 830034).

THE Northern Goldfish and Pondkeepers Society, held their third show in Bolton on 4th August. The society thanks all those who made the long trip to be with them, especially those exhibitors from Bristol, Birmingham, Cornwall and Scotland. Trophies were presented by David and John, of Dave's Aquarium, Bolton. Best Fish in show went to W. H. Ramsden and B. Rothwell for their Common Goldfish. Best Breeders team of 1979 taking the Aquarian trophy; B. Rothwell. Team of Bristol Shubunkins.

Best Exhibit: 1, B. Rothwell and W. H. Ramsden; 2, G. Bell; 3, D. Gordon and S. Stephenson. Goldfish: 1 and 3, W. H. Ramsden and B. Rothwell; 2, P. Lane. Comets: 1 and 2, P. Lane; 3, J. Cairney. Bristol Shubunkins (3 in.): 1 and 3, D. Johnson; 2, H. J. Whiting. Bristol Shubunkins (5 in.): 1, 2 and 3, B. Rothwell. Veittals: 1 and 3, P. Johnson; 2, J. Moore. Moors: 1, V. Cane; 2 and 3, W. H. Ramsden. Orandas: 1 and 2, D. Lord and W. Gregory. Lionheads: 1, D. Gordon and S. Stephenson; 2, F. W. Orme; 3, R. J. Pinnock. Fantails Galico: 1, P. Lane; 2, P. Hewitt; 3, R. L. Howarth. Fantails metallic: 1 and 2, P. Lane; 3, D. Lord and W. Gregory. Bubbles: 1, 2 and 3, D. Lord and W. Gregory. Pearlscales: 1, P. Lane; 2 and 3, R. Williams. A.O.V.: 1 and 3, V. Cole; 2, P. Hewitt. Breeders team Bristol Shubunkins: 1, 2 and 3, B. Rothwell. Breeders team Veittals: 1, 2 and 3, B. Rothwell. Breeders team Moors: 1 and 2, W. H. Ramsden; 3, R. J. Pinnock. Breeders team Fantails: 1, 2 and 3, P. Lane. Breeders team A.O.V.: 1 and 3, P. Hodgkinson; 2, D. Gordon and S. Stephenson. 1 Fish bred 1979 (single-tail): 1, 2 and 3, B. Rothwell. 1 Fish bred 1979 (twintail): 1, W. H. Ramsden; 2, D. Gordon and S. Stephenson; 3, B. Rothwell. Pond Fish, European: 1, R. Fisher and G. Terry; 2, P. Hewitt; 3, J. Moore. Pond Fish non-European: 1 and 2, D. Lord and W. Gregory; 3, P. Lane. Matched Pairs: 1, G. Bell; 2, W. H. Ramsden; 3, F. W. Orme.

Longridge and District A.S. third Open Show was a great success. Just under 400 exhibits were benched with people travelling from all over Lancashire and Cheshire to attend. Top Society proved once again to be the Sandgrounders from Southport.

Although the entries were down on last year, the standard remained high, giving the judges a long and difficult task. They finally awarded the Aquarist and Pondkeeper Gold Pin to young Lee Groves of Sandgrounders, with K. Buckley taking second and third spots.

Results: Key to Societies: Blackpool: B; Bridgewater: Br; Darwen: D; Fleetwood: F; Leigh: L; Longridge: Lo; Lynton: Ln; Merseyside: M; Morecambe Bay: MB; Nelson: N; Northern Goldfish and Pondkeepers: NGP; Northwich: No; Runcorn: R; Sandgrounders: S; St. Helens: SH.

Guppies: 1, B. and J. Durham (Lo); 2 and 3, T. Dean (F). Mollies: 1, 2 and 3, Mr. and Mrs. Iddon (S). Platies: 1 and 2, B. and J. Durham (Lo); 3, M. and J. Bradshaw (Lo). Swordtails: 1, M. and J. Bradshaw (Lo); 2, B. Frost (F); 3, P. Durham (Lo). Linnies: 1, N. Wallbank and J. North (MB); 2, G. Lawless (L); 3, B. and W. Kenyon (B). A.O.V. Livebearers: 1 and 2, P. Harris (SH); 3, B. and J. Durham (Lo). Small Characins: 1, N. Wallbank and J. North (MB); 2, Mr. and Mrs. Underwood (S); 3, F. S. A. Hopwood (D). Large Characins: 1 and 2, Mr. and Mrs. Underwood (S); 3, L. Groves (S). Small Barbs: 1, F. S. A. Hopwood (D); 2, Mr. and Mrs. Underwood (S); 3, J. Haley (D). Large Barbs: 1, B. and J. Durham (Lo); 2, Mr. and Mrs. Baldwin (S); 3, J. Roberts (N). Rasboas: 1 and 2, Mr. and Mrs. Underwood (S); 3, J. Corbett (M). Danios and Minnows: 1, Mr. and Mrs. Underwood (S); 2, Mr. and Mrs. Baldwin (S); 3, A. Hamlet (No). African Killifish: 1, 2 and 3, K. Buckley (Br). A.O.V. Killifish: 1 and 2, K. Buckley (Br); 3, A. Hamlet (No). Small Anabantids: 1 and 2, P. Harris (SH); 3, Mr. and Mrs. Underwood (S). Large Anabantids: 1, Mr. and Mrs. Underwood (S); 2, Mr. and Mrs. Baldwin (S). Siamese Fighting Fish: 1 and 2, D. Conway (D); 3, Mr. and Mrs. Baldwin (S). Small Cichlids: 1, J. Corbett (M); 2, D. and G. Moseley (F); 3, Mr. and Mrs. Iddon (S). Large Cichlids: 1, L. Groves (S); 2, Mr. and Mrs. Underwood (S); 3, B. and W. Kenyon (B). Angel Fish: 1, K. Buckley (Br); 2, L. Buckley (Br); 3, D. Garstang (Lo). Corydoras and Brochis: 1, R. Hodge (S); 2, Mr. and Mrs. Underwood (S); 3, B. and J. Durham (Lo). A.O.V. Catfish: 1 and 3, Mr. and Mrs. Underwood (S); 2, P. J. Harwood (D). Loaches and Botias: 1, Mr. and Mrs. Under-

wood (S); 2, N. Wallbank and J. North (MR); 3, B. and J. Durham (Lo). Sharks, Labrets and Foxes: 1, L. Pountain (R); 2, Mr. and Mrs. Baldwin (S); 3, A. Hamlet (No). A.O.V. Tropical Egg-layer: 1 and 2, P. and H. Batchelor (Ln); 3, Mr. and Mrs. Baldwin (S). Tropical Marine Fish: 1, G. Lawless (L). Common Goldfish and Comets: 1, Mr. and Mrs. Hewitt (NGPS); 2, G. Lawless (L); 3, L. Pountain (R). Shrubskins: 1 and 2, Mr. and Mrs. Hewitt (NGPS); 3, B. Frost (F). Fantails, Veiltails and Moons: 1, Mr. and Mrs. Hewitt (NGPS); 2, Mr. and Mrs. Dixon (B); 3, G. Kenyon (B). Lionheads and Orandas: 1, Mr. and Mrs. Hewitt (NGPS); 2, T. Dean (F); 3, Mr. and Mrs. Weaver (L). A.O.V. Fancy Goldfish: 1, Mr. and Mrs. Hewitt (NGPS). A.O.V. Coldwater Fish: 1, Mr. and Mrs. Haigh (B); 2, B. Frost (F); 3, Mr. and Mrs. Weaver (L). Livebearer Pairs: 1, P. Kenyon (S); 2, K. Corbett (M); 3, B. Frost (F). Egg-layer (Pairs): 1 and 3, K. Buckley (Br); 2, Mr. and Mrs. Baldwin (S). Livebearer (Breeder A and B): 1, Mr. and Mrs. Baldwin (S). Livebearer (Breeder C and D): 1, J. Corbett (M); 2, G. Lawless (L). Egg-layer (Breeder A and B): 1, K. Buckley (Br); 2, B. and W. Kenyon (B). Egg-layer (Breeder C and D): 1 and 2, D. and G. Moseley (F); 3, D. Wright (B). Coldwater Breeders: 1, Mr. and Mrs. Hewitt (NGPS). Junior Guppies: 1, S. Waterhouse (L); 2, D. Glegg (MB). Junior Mollies: 1, L. Groves (S); 2, P. and I. Iddon (S); 3, M. Rimmer (S). Junior Platies: 1, K. Corbett (M); 2 and 3, M. and J. Bradshaw (Lo). Junior Swordtails: 1, 2 and 3, L. Roberts (N). Junior A.O.V. Livebearer: 1, K. Corbett (M); 2 and 3, G. Lawless (L). Junior Characins: 1 and 3, L. Groves (S); 2, R. Underwood (S). Junior Barbs: 1, R. Underwood (S); 2, P. Kenyon (S); 3, M. Rimmer (S). Junior Rasboras, Danios and Minnows: 1, R. Underwood (S); 2, M. Rimmer (S); 3, L. Roberts (N). Junior Killifish: 1, M. Rimmer (S); 2, T. Kenyon (B); 3, P. Lanyon (S). Junior Anabantids: 1, S. Waterhouse (L); 2, L. Roberts (N); 3, G. Kenyon (B). Junior Cichlids: 1, W. Underwood (S); 2, K. Corbett (M); 3, J. Baldwin (S). Junior Catfish: 1, P. Underwood (S); 2, L. Groves (S); 3, J. Baldwin (S). Junior Sharks, Foams and Loaches: 1, D. Garstang (Lo); 2, P. Underwood (S); 3, P. and I. Iddon (S). Junior A.O.V. Tropical Fish: 1, D. Garstang (Lo); 2, S. Waterhouse (L); 3, P. Stanhope (F). Junior Coldwater Fish: 1, S. Waterhouse (L); 2, G. Lawless (L); 3, P. Durham (Lo). Mini Jars: 1, D. Roberts (M).

THE South East London A.S. thank the exhibitors for showing 717 fish and the judges for their hard work.

Key:—A-Ashford; BA-Basingstoke; BD-BDAS; BO-BOAS; BR-Brighton; ED-EDAS; EL-ELAPA; HAR-Harlow; HAS-Hastings; I-Iford; K-Kington; M-Medway; N-Newbury; ORP-Orpington; R-Romford; SA-Saracens; SE-SELAS; SL-SLADAS; ST-Stroud; SUD-Sudbury; T-Thaxet; W-Walthamstow.

Results:—Ad: 1, Mr. Fursedorn (W); 2, T. Waller (EL); 3, A. Waller (EL). Ba: 1, Bill Hastings (SE); 2, J. Edwards (T); 3, D. and P. Lambert (K); 4, F. May (N). B: 1, R. Mitchell (BD); 2, M. Bourne (SE); 3, T. Ramshaw (BR); 4, Mr. Akhurst (T). C: 1, J. Edwards (T); 2, Mr. and Mrs. Pannel (HAS); 3, Mr. Henman (HAR); 4, Bill Hastings (SE). Ca: 1, B. Sayers (BR); 2, C. Richards (SUD); 3, P. Edwards (T); 4, David Winder (ED). Cb: 1, M. Bourne (SE); 2 and 4, C. A. Raggio (BR); 3, Mr. Witteridge (SUD). D: 1 and 2, Bill Hastings (SE); 3, John Part (R); 4, F. May (N). Da: 1, J. London (SL); 2, C. Fennis (ST); 3, T. Woolley (SLG); 4, R. Mitchell (BD). Db: 1 and 3, M. Bourne (SE); 2, Mr. and Mrs. Brook (SE); 4, J. Owen (ORP). Dc-a: 1, G. Steptoe (R); 2 and 4, J. V. Payne (SE); 3, M. Bourne (SE). Dc-b: 1, R. F. Thoday (EL); 2, R. Mitchell (BD); 3, G. Steptoe (R); 4, J. V. Payne (SE). Dc-c: 1, Mr. and Mrs. Henman (HAR); 2 and 4, J. V. Payne (SE); 3, R. F. Thoday (EL). Ea: 1 and 3, B. Barford (SE); 2, A. Waller (ED); 4, Bill Hastings

(SE). E: 1, M. Bourne (SE); 2, P. Moye (SUD); 3, J. Arnot (A); 4, Mr. and Mrs. Brook (SE). Ed: 1, C. Richards (SUD); 2, G. Steptoe (R); 3, E. J. Jackman (HAS); 4, D. and J. Wood (EL). F: 1 and 4, E. and B. Lough (K); 2, H. G. R. Johnson (SE); 3, R. F. Thoday (EL). G: 1 and 2, P. and M. Lambert (EL); 3, Mr. and Mrs. Brook (SE); 4, Bill Hastings (SE). G: 1, J. Part (R); 2, C. Fennis (ST); 3, D. Goodwin (BD); 4, C. Richards (SUD). Ha: 1, David Winder (ED); 2, A. Waller (EL); 3, I. R. Walker (T); 4, T. Woolley (SLG). H-a: 1, R. F. Thoday (EL); 2, Mr. Lester (SA); 3, H. G. R. Johnson (SE); 4, G. Owen (ORP). H: 1 and 3, C. Fennis (ST); 2, T. Ramshaw (BR); 4, M. Bourne (SE). J: 1, Doris Winder (ED); 2, J. Owen (ORP); 3, P. Edwards (T); 4, J. Edwards (T). K: 1, I. R. Walker (T); 2, Mr. Akhurst (T); 3, J. Jackson (BA); 4, E. and B. Lough (K). L: 1 and 2, R. F. Thoday (EL); 3, S. and L. Jeffery (SE); 4, C. Richards (SUD). Ma: 1, T. Ramshaw (BR); 2, D. Goodwin (BD); 3, E. R. Keep (SE); 4, C. Richard (SUD). M: 1, J. London (SL); 2, P. Moye (SUD); 3, Mr. Witteridge (SUD); 4, Mr. and Mrs. Pannel (HAS). Nb-m: 1, T. Ramshaw (BR); 2, J. Jackson (BA); 3, M. Bourne (SE); 4, C. Osborne (SE). NOT: 1, T. Ramshaw (BR); 2 and 3, C. Richards (SUD); 4, S. Webb (HAR). O: 1, D. and J. Wood (EL); 2, C. Richards (SUD); 3, F. May (N); 4, P. J. Holding (W). P: 1, A. Chapman (EL); 2, P. J. Holding (W); 3, J. E. Myers (L); 4, Mr. Witteridge (SUD). Q: 1 and 2, E. J. Jackman (HAS); 3, Mr. Akhurst (T); 4, C. Fennis (ST). R: 1, T. Woolley (SLG); 2, E. J. Jackman (HAS); 3, S. J. Barker (HAS); 4, C. Fennis (ST). S: 1, 2 and 3, D. and J. Wood (EL); 4, Bill Hastings (SE). T: 1, J. Edwards (T); 2, D. G. Swale (ED); 3, T. Ramshaw (BR); 4, P. Moye (SUD). U: 1 and 2, P. Mills (W); 3, S. M. Brown (EL); 4, A. Steeden (SE). V: 1 and 2, B. Beet (BD); 3, D. and P. Lambert (K); 4, T. Aquith (SE). W: 1, G. Owen (ORP); 2, 3 and 4, B. Beet and Woodward (BD). Xb-m: 1, P. Edwards (T); 2, Mr. Lester (SA); 3, G. Owen (ORP); 4, S. Webb (HAR). XOT: 1, J. Edwards (T); 2, G. Carpenter (M); 3, B. Barford (SA); 4, F. May (N). Y: 1, T. Slight (SE); 2, G. Steptoe (R); 3 and 4, M. Bourne (SE). Z: 1 and 4, B. Beet and Woodward (BD); 2, P. Mills (W); 3, E. and B. Lough (K). Best Catfish, J. Part; Best Coldwater, G. Owen; Best Fish in Show, Class K, I. R. Walker; Highest pointed junior, M. Bourne; Highest pointed Club, S.E.L.A.S.; Club Trophy, E.L.A.P.A.

DUE to the fact that Merthyr A.S. have been asked to organise an Open Show to celebrate the St. Tydfil Festival 1980 in 1980, there will not be an open show at Merthyr Tydfil on 6th October of this year.

Port Talbot A.S. were invited by the British Steel Company at Port Talbot to put on an exhibition at their Gala Day. Members brought along fish totalling approximately 200 making a fantastic display, including 20 tanks of Coldwater Fish and a display of Malawi Cichlids. The marquee provided also displayed furnished aquariums and potted plants to make it really attractive to the public who seemed eager to view the displays, and there was a non-stop flow of people for the five hours it was open. Approximately 10,000 attended the Gala Day.

CHANGE OF VENUE

Aylesbury A.S. now meets at the Hop Pole Hotel, Bicester Road, Aylesbury on alternate Tuesday evenings from 13th November—General Club Meeting; Table Show: Any Pairs; 27th November, Talk and Slide Show, "Killifish," by Mr. Ian Sainthouse; 11th December, Xmas Social Evening; 8th January, A.G.M. Visitors and new members welcome. For further details contact the Secretary, P. Wheeler, 141 Wendover Road, Stoke Mandeville, Bucks. (Tel: S.M. 2499).

CANCELLATION

The Eboracum Open Show which was to have been held in October has been cancelled. All trophies should be returned to Mr. M. Noblet, 6 Bellhouse Way, York.

CALENDAR

3rd October: Rothwell A.S. First Mini Open Show at Royds School, Pennington Lane, Rothwell, Nr. Leeds. Schedules from Mr. M. Linden, 9 Mill Hill, Pontefract, Yorks. (Phone: Pontefract 704457).

5th October: Scunthorpe & District A.S. bring and buy sale at the Brown Cow Hotel, High Street, Ashby, Nr. Scunthorpe.

6th October: The British Aquarists' Study Society annual general meeting, followed, at 2 p.m. in the Meeting Rooms of the Zoological Society of London, Regents Park, N.W.1 by the Annual Conference. Membership details from the Secretary, Michael Shadrack, 61 St. Barbara Road, Woodford Green, Essex.

7th October: Wolverhampton A.S. open show at the Oxley Community Centre, Marsh Lane, Wolverhampton. Benching 12.2 p.m.

7th October: Louth and District A.S. open show.

7th October: Newbury and District A.S. 7th open show at the Corn Exchange, Newbury. Details from Mrs. S. Canning, 6 South End, Thatcham, Berks. (Tel: Thatcham 64254).

7th October: Louth and D.A.S. Open Show at Cordaux High School, Louth, off A.16 "Lady of Shalott". Show Secretary: D. A. Parrish, 23 Home Farm, Withcall, Louth, Lincs. LN11 9RL.

12th October: East London Aquarists and Pondkeepers Association breeders open show.

14th October: Darwin A.S. second open show at the Darwin Library Theatre. Schedules available later from Show Secretary, Mr. B. Walsh, 9 Marsh Terrace, Darwin, Lancs.

14th October: South Leeds A.S. open show at Hunslet Boys' Club, Hillside Road, Leeds 10. Benching 12 noon to 2.00 p.m. Schedules from Mr. A. Aunwick, 151 Throstle Road, Middleton, Leeds LS10 4HH.

14th October: The Priory Aquarist Society are holding their annual open-show at St. Aiden Church Hall, Billy Tib Lane, North Shields.

14th October: South Park Aquatic (Study) Society Inter-Club Show for coldwater fish at Drake House, St. George's Road, Wimbeldon. Inquiries and schedules to L. B. Clapp, 16 Overhill Way, Beckenham, Kent (Tel: 01-650 6954). Also on same day, same venue, Open Show for plants, trophies and coldwater fish.

20th October: Ichiban Rancho Society open show at St. Paul's Hall, Woodford Bridge, Essex.

20th October: The Ichiban Rancho Society National Open Show to be held at St. Pauls Church Hall, Woodford Bridge, Essex. Schedules available from Mr. G. Lewis, 91 Bourne Avenue, Hayes, Middx. Phone: 01-573 1770. There will be seven classes, including a sales class and of course the new challenge shield entry announced earlier in this Magazine.

There will be trophy and plaque awards in every class except the sales class. This is a specialist show of lionhead goldfish only.

21st October: Doncaster & District A.S. open show. Don Valley High School, Jossey Lane, Scawthorpe, Nr. Doncaster. Details from show secretary, Mr. K. Lancashire, 20 Symes Gardens, Cantley, Doncaster.

29th October: Midland Aquarist League open show and inter-society show, incorporating 1st award winners classes, at Hill Street Youth Centre, Rugby. Schedules from F. Underwood, 10 Hyde Road, Kenilworth CV8 2PD (Tel: 59280).

4th November: Halifax A.S. open show. Details later.

4th November: Halifax A.S. Open Show at the Forest Cottage Community Centre, Cousins Lane, Ilkingsworth, Halifax. Schedules sent only on request with s.a.e. to D. Shields, Cobblestones, Gainest, King's Cross, Halifax or ring for details Halifax 60116.

11th November: Bradford and District A.S. open show at Textile Hall, Westgate, Bradford. Details from Show Secretary, Mr. R. Stanfield, Station House, Leeds Road, Shipley. (Tel: Bradford 595097).