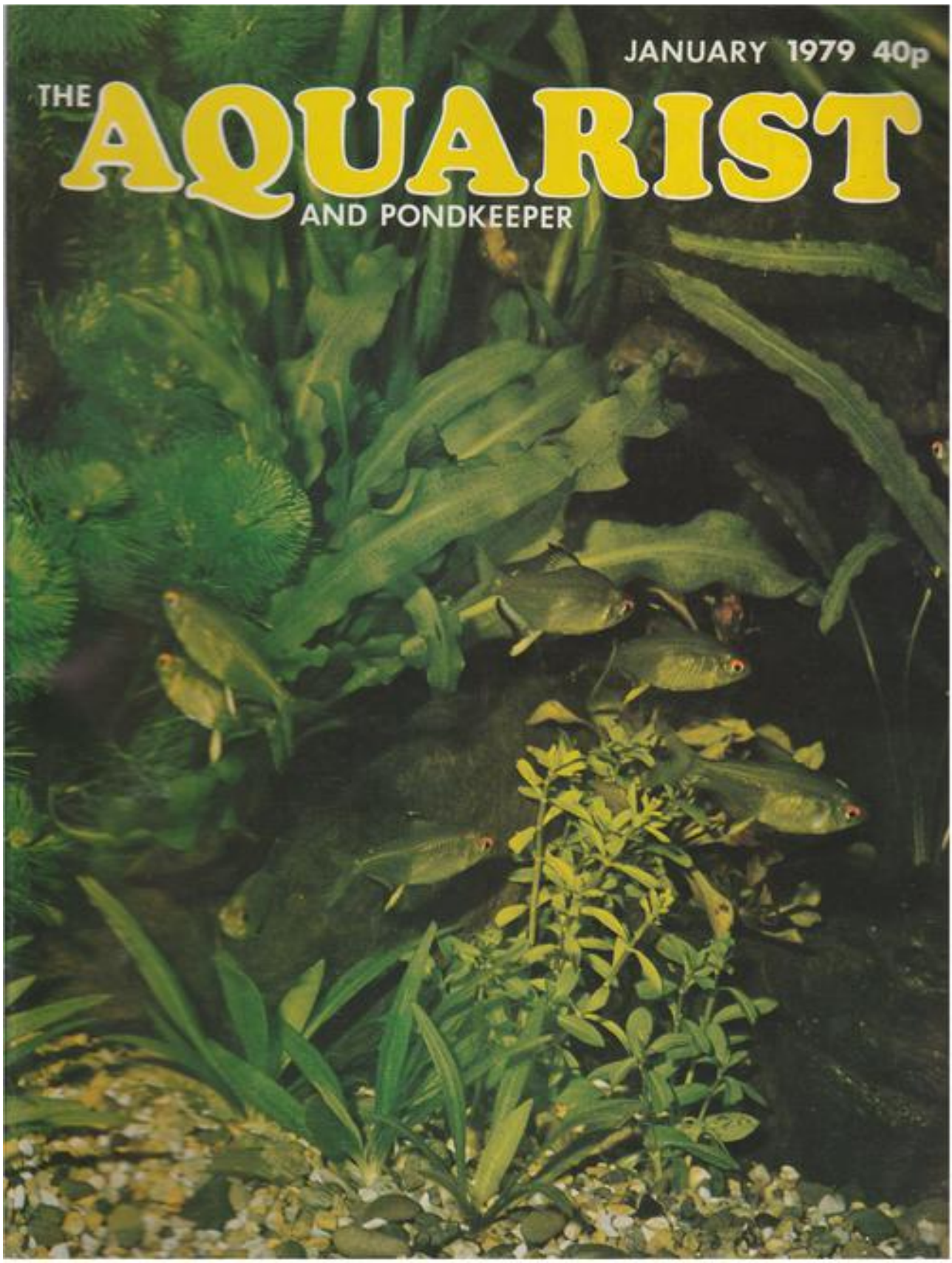

JANUARY 1979 40p
THE
AQUARIST
AND PONDKEEPER

THE AQUARIST AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

Published Monthly 40p

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

Subscription Rates:
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. XLIII No. 10, 1979

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

Contents

OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE
All queries MUST be accompanied by a stamped addressed envelope.

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

TROPICAL QUERIES

by Jack Hems

I bought a 10 in. snake fish the other day and cannot find anything about it in my aquarium books. Please can you help me with regard to its scientific name, its general requirements and behaviour in captivity?

The snake fish, or reed fish, is known to science as *Calamoichthys calabaricus*. It lives in the natural state in the delta of the river Niger and belongs to the family *Polypteridae*. It is the only representative of its genus. Ordinarily it moves in a serpentine manner, as you will have observed, like a snake or eel, in all levels of the water. Narrow strips of raw red meat, earthworms and surplus livebearer fry, among other things, are readily eaten. It is peaceable and is quite trustworthy in a community tank provided the other fishes are of an equally inoffensive disposition. In its native waters it can attain a length of about 3 ft. In the aquarium, however, it does not appear to grow much larger than about 18 in. It has no ventral fins and the dorsal fin is composed of a series of finlets. It has an accessory breathing organ which enables it to survive in wet mud when the waters go down.

Please tell me something about a livebearer called *Ameca splendens*.

A. splendens is a member of the family *Goodeidae* confined exclusively to Mexico. The male is characterised by a notched anal fin, the first six or so rays of which are bunched together and form a gonopodium or fertilizing organ. The female, after fertilization, produces just one batch of fry and not several in succession as is customary among the better known livebearers of the genus *Poecilia*. In short, then, the female *A. splendens* has to be fertilized afresh for every batch of young she delivers. *A. splendens* is a most attractively coloured little fish which attains a length of about 2½ in. It flourishes well at a temperature in the middle to upper seventies (°F) and is neither faddy about the water it is kept in (provided it is clean and well-aerated) nor its food. Plenty of plants, however, are necessary to afford shelter for new-born fry.

Cichlasoma facetum

I have been told that a local dealer has some albino *Cichlasoma facetum* **for sale. Is this fish a good mixer in a fairly spacious community tank?**

I do not think there is a true albino *C. facetum*. For a true albino fish, rat, rabbit or whatever is characterized by red-currant eyes. The white or pinkish white *C. facetum* I have seen have all had dark eyes. Be this as it may, the white or pinkish form of *C. facetum* is said to be quite mild mannered and suited to living in a community tank stocked with non-belligerent fishes of about its own size. *C. facetum* grows to about 4 in, takes almost any food, and breeds freely. The well-grown male develops longer and more pointed dorsal and anal fins than the female.

I should like some tips on the care of *Gyrinocheilus aymonieri*.

There is really very little to say about this sucker fish from Thailand. A temperature of about 75°F

(24°C) suits it well. It dines almost exclusively on mossy algae. It is not an ideal fish for a community tank because as it increases in size (it can exceed 7 in. in captivity) it can have boisterous moments which disturb shallow-rooting plants and churn up fine sediment. Worse. It sometimes clings to the sides of another fish. Too much of this clinging business usually results in sore places and the general deterioration of the health of the fish too frequently molested. Finally, the fish is not a true loach but merely a fish with a sucker mouth specially developed for clinging to stones and plants and rasping off green food.

Tetraodon palembangensis

I should be most grateful for some information on *Tetraodon palembangensis*.

This puffer fish from south-east Asia is found in salt, brackish and fresh waters. It is not recommended for a community tank, for it is a bit of a fin-nipper. For all that, it is prettily marked with dark spots on a ground of broken green and ivory-yellow and does well in a single species tank of slightly salted water maintained at a temperature of about 75°F (24°C). If the fish settles down well and its water is kept very clean, it can live for several years. Feed it on small water snails, guppy fry, or small pieces of raw lean meat or uncooked fresh haddock, cod, or similar white fish. The popular name for *T. palembangensis* is figure eight puffer.

What is the best set up for keeping and breeding *Apistogramma ramirezi*?

A tank filled with old and peaty acid water, plenty of plants, and an overturned flowerpot or two to serve as a breeding place. A temperature of about 75°F (24°C) is suitable for general care and maintenance. For breeding, however, a temperature of 78°F (26°C) is recommended.

Is rain water draining off a tarred-felt roof suitable for topping up my aquariums?

I advise against using this water. What I do advise, however, is that you tack a sheet of clean polythene (grade 500 or 1000) to the roof and see to it that rain water draining off the polythene—raised slightly off the felt on wooden battens—is collected in a clean plastic bucket.

I am interested in keeping and breeding species of *Aphyosemion*. Unfortunately dealers in my area seldom have any for sale. Can you suggest a good source of supply?

It is not difficult to raise many different species of *Aphyosemion* from eggs sent through the post. *Aphyosemion* eggs are advertised fairly frequently in our classified advertisements pages. You would benefit by joining the British Killifish Association.

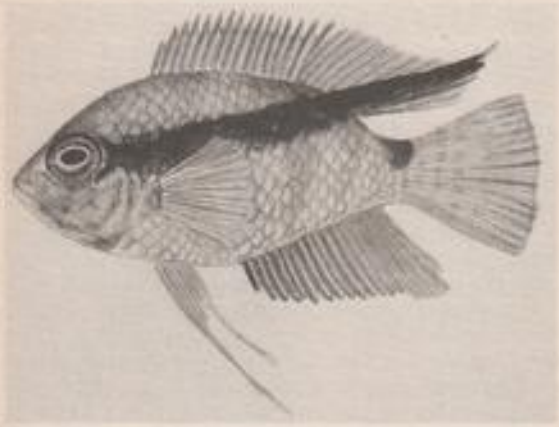
I am a beginner in fishkeeping and the behaviour of my two angel fish is puzzling me. Every so often the smaller of the two makes a sudden rush at its opposite number. This fish usually backs away or else stands its ground and twitches its ventral fins as though something is irritating it. Then the other angel fish extends its dorsal and anal fins and trembles with what seems like rage or excitement. Can you tell me what is wrong with the fish?

There is nothing wrong with your fish. You are merely witnessing a performance put on to (a) intimidate the rushed at fish and demonstrate who is boss, or (b) awaken the rushed at fish's sexual interest. Sometimes two fish of the same sex will go through with this performance but usually if you have a true pair (a male and a female) the above actions will be accompanied, a little later, by the cleaning of a sturdy leaf of a plant or a piece of stone. All this in preparation for egg-laying. If a female angel fish is ripe for spawning her abdominal region will look distended; that of the male will remain flat. When the two fish start fussing over a leaf or a stone observe their anal apertures. The male will extrude a slim and elongated tube; the female will extrude a short and fat tube. These tubes are used by the fish for depositing the eggs (in the female) and fertilizing them (the male). *Angel Fish—King of the Aquarium* is a booklet that should be in your possession. We can send you a copy for 60p. post paid.

I have a small plastic tank and, every so often, more especially at night or in a poor light, I have noticed tiny white worms gliding in every direction over the inside of the tank. I have plenty of gravel on the bottom and feed my mixed collection of fishes on dust-fine food (for the guppy fry) and larger flakes and tiny pieces of raw liver for the adults. Are these white worms dangerous and how can I get rid of them?

You are feeding your fishes too generously and rather rashly (raw liver disintegrates into bloody particles that can soon turn the water smelly and sour) and a lot of this food is reaching the interstices of the gravel where the fishes cannot reach it. Give the gravel a non-violent but thorough raking over with an old table fork and then siphon away the churned up cloud of muddy or grey particles of decaying matter. After a gallon or two of water has been drawn off, top up

with water that has been boiled first and then cooled down to aquarium temperature. The white worms you have noticed are natural scavengers called planarians or flat worms, which multiply rapidly on dirt in the initial process of decay. The less decaying matter the healthier your aquarium will be and the fewer the worms. There are always a few planarians in almost every aquarium. They do no harm to grown fishes but can damage fishes' eggs.



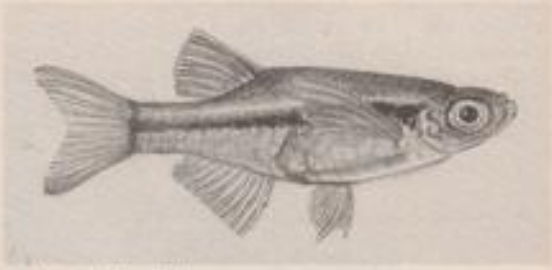
Cichlasoma festivum

I have two *Cichlasoma festivum* and two firemouth cichlids. Up to a week ago, these fish got on well together. But when I introduced some young convict fish (*Cichlasoma nigrofasciatium*), I soon observed that the other fishes were swimming about with a few scales missing and torn fins. What should I do?

Remove the convict fish to another tank. Sooner or later convict fish break out and attack one another—if there are several of the same species living together—or other fishes in the tank. They are, as they increase in size, compulsive bullies and fin-nippers.

Is there such a fish as a *houri*?

There is but I fail to see the connection between this characoid, with no colors to rhapsodize about and a mouth bristling with frightening-looking teeth always ready to sink into its prey (other fishes or other small creatures) and the patchouli-scented nymphs of some eastern paradise. Its other popular name of tiger fish is much more apt. In years gone by the *houri* or tiger fish was usually described under the technical name of *Hoplias malabaricus*. It grows to about 2 ft. in the wild and about a foot to 15 in. in captivity. It is widely distributed over almost all of South America north of Bolivia and the aquarist who buys one requires a sizable tank to keep it in, a stout glass cover to keep it jumping out, and a plentiful supply of raw meat, raw fish or freshly killed freshwater fishes for it to feed on. In up-to-date books the species is listed under the scientific name of *Macrodon traira*.



Laubuca dadiburjori

Will *Laubuca dadiburjori* make a trustworthy community fish?

L. dadiburjori from Bombay and its environs is a small (1¼ in.) cyprinid well suited to a community tank. It takes all dried, flesh and live foods readily and flourishes well in any ordinary mains water that has been left to mature. It is a gregarious fish that likes to swim with its own kind; so a small shoal is advised. It is a middle and surface swimmer and a great jumper. Hence its tank should be properly covered. It looks and mixes well with the general run of well-behaved fishes. *L. laubuca*, another species from India, grows to nearly twice the size but is equally at home in a community tank and is equally inoffensive.

I have just set up a tank for a pair of fancy guppies. How can I prevent the live babies being eaten?

What you need is a very thick growth of plants rising from the bottom and then spreading in ferny layers over most of the surface. The plant called Indian fern (*Ceraptoris thalictroides*) is a great baby saver. Mark you, a few of the newly born fry are almost certain to be snapped up by the alert adult fish, but the majority of every batch delivered will escape into the thicknesses of the underwater foliage and there grow too big to be eaten by cannibalistic parents and, later, by well-grown brothers and sisters. The few hours' old fry can always find microscopic live food among the water plants and these, supplemented by a merest dusting of a proprietary fry food, will bring them along to the stage where they will take any fine granulated food or crushed flake. Better still, Grindal worms or brine shrimp. I must remind you, however, that a few batches of guppies will soon be too much to grow on in a small tank. Therefore, at your earliest convenience, buy one or two small tanks for growing on the best of every bunch or one larger tank which can be divided into separate compartments with glass divisions.

COLDWATER QUERIES by Arthur Boarder

I have lost a few goldfish in an outdoor pond and the only damage I can find is that the anal fins appear to have been eaten away. What is the cause please?

It is rather unusual for the anal fins to be damaged and not other fins. If the fish were females I can understand this because when spawning takes place, the male fish knock at the vent and anal fins of the female fish and so could cause damage. Look at the rest of the fish and if any are seen with fungus disease, fin-rot or fin-congestion you should give such fish a bath in a sea salt solution at the rate of a tablespoonful to the gallon of water. Leave the fish in for a few hours each day until cured. I think that you have over-stocked your pond with fishes. Many pondkeepers think that they are not successful unless the pond is teeming with fishes. This is a great mistake as it is far easier to keep fishes in a healthy condition when they are not crowded together. Any pests or diseases which may affect a fish could be passed on to others quite easily. The healthiest fishes are usually those in ponds where they have plenty of swimming space.

I have a tank 30 × 15 × 12 inches and would like to house a pair of fancy goldfish with the idea of getting them to breed. How shall I plant up the tank and is there any other advice you can give me?

The tank needs to be well planted with oxygenating plants and Hornwort is a very good one as the thin abundant leaves are ideal for holding the eggs. I do not advise that you have any rocks in the tank as these could cause damage if the fish spawned vigorously. As a matter of fact for a tank of fancy goldfish I think that one can do without rocks altogether unless one is entering in an exhibition. The rocks soon get covered with Algae and so do not show up after some time. I do not think that it is as easy to breed goldfish in a tank as it is in a garden pond. In all the years I have kept fancy goldfish in tanks indoors, I have never found that any have bred. Whereas in the garden pond one would have a job to stop them.

However, I must admit that I used to put the young fish out into the pond when they were of a fair size and so adult fishes were not often in the tanks. With one pair of fish and good feeding you should be able to breed from the fish. See that the water is always very fresh and well oxygenated. In the warmer months it is advisable to remove a third of the water and fill up with fresh cold. This often excites the fish to spawn.

I intend to make a pond in my garden and will be glad if you can give me all the necessary information on its construction, stocking and maintenance.

I appreciate your wish to get as much information as possible before you start to make your pond, but there is so much to be said about the project that it is not possible to put all the instructions in a letter. A whole book would be necessary for the purpose and fortunately such a book has been written. It is entitled "Coldwater Fishkeeping" and can be obtained from the Aquarist & Pondkeeper at £1·50 including post and packing.

There are some strange creatures in my garden pond. They are about half an inch long or slightly over and a quarter of an inch wide. They appear to have a paddle each side of them with which they propel themselves through the water. What are they and are they harmful to goldfish?

Your creatures appear to be Water Boatmen, *Notonecta*. They progress through the water with the aid of the two long legs. They often float to the surface as they are covered with air bubles which they gather at the surface. They pierce the film on top of the water with their rear end and take in air. They feed on any living creature they can catch and will even attack a small fish. If handled carelessly they can give quite a nasty prick. The females lay their eggs in a slit of a water plant stem. These creatures are particulary dangerous in ponds where fishes are being bred as they can eat many fry. As they have to come to the surface to breathe they are not difficult to catch with a net. If you are quick you can snap them up with your fingers, but mind the beak. At night is the best time to catch them as they appear to be much longer at the surface and cannot seem to see the net as easily as during the daytime.

I have three goldfish in a tank and they have what appears to be a kind of white film round their mouths. It does not look like Fungus disease. They appear to be otherwise all right. What is the trouble please?

Your fish are suffering from Cotton Wool disease. This is contagious and is caused by a bacterium, *Chondrococous*. The fish can be cured by wiping the mouth with Chloromycetin. Hydrogen peroxide at 3% has also been used as a cure. You may have to repeat the treatment two or three times. Hold the fish carefully in a wet cloth whilst under treatment. Change the water and disinfect the tank.

I have a good sized tank well planted with various types of oxygenating plants. I also have a filter, but after a few months the water takes on a whitish powdery look which settles on the plants. What is this and how can I prevent it?

It appears that it is a limey or chalky deposit which comes from the fresh tap water you use when you clean out some of the water and refil with fresh. Try a small bag of peat at the back of the tank. This will tend to counter the effect of the alkaline matter in the water.

I have a garden pond 8 ft. × 5 ft., and 2 ft. deep. It has a liner in it and lately I have found that it is losing water and I have to top it up constantly. Is there anything I can treat the liner with to make it hold water?

If you had lined the pond with a good liner it should not leak. However, you stated that under it there was a quantity of clay in which some clinkers had been added to stiffen it. There may have been some punctures caused by the clinkers. You can get sealants for mending a liner from dealers who advertise in The Aquarist. If, however, the whole liner has become porous then you will have to get a new one as I cannot see much sense in trying to patch up one which may be weak all over. One or two obvious leaks can be mended but an overall leak is another matter.

I am thinking of converting my tropical tanks, both 48 × 18 in., to coldwater fishes. If I put them in my shed do you think that they will be all right during the winter?

Unless you have some form of heating in your shed the water in your tanks could freeze and the glass could crack. The fish would not mind the cold but you must provide something to keep out the frost even if only occasionally when this is predicted. If no electricity is available to work a couple of heaters, you might find that a small paraffin heater as is used in a garage would be enough to keep the water from freezing.

I want to keep fancy goldfish and when I have gained some experience I would like to breed them. However, I want to get some decent types to start with but my visits to pet shops have been of no use, as I have only found very poor quality fishes, many with poor shapes and diseases. Can you help at all?

I quite understand how you have been disappointed in your search for good quality fancy goldfish. You can hardly expect the average pet shop to stock a number of good types of fancy goldfish. They are usually expensive and one is only likely to find common goldfish in such shops and the owners may not have a lot of experience in obtaining or keeping good quality fancy goldfish. I am enclosing an address where you can get the fishes you require.

How old do goldfish have to be before they will breed?

If you mean goldfish which have been bred in a garden pond, then about three years old. However, so much can depend on other circumstances. The youngest goldfish I have ever bred from were just eight months old. However, these were raised under warm conditions and were as large as goldfish would have been in 3 years had they been pond bred and reared. The fish in question were fantails and had a body length of about two inches. The fish were from a late spawning in the pond, actually in September. As it was unlikely that the fry could have been raised without some warmth, the eggs were put in a greenhouse and a heater inserted in the tank, keeping the water temperature at just over 70°F. Warmth was continued and the fry were fed well throughout the winter. In May the following year they spawned and produced some fine youngsters. If the eggs had been left in the pond to hatch it is almost certain that no fry would have survived the winter as I have found that unless youngsters are about two inches long overall by the winter, they have little chance of surviving.

Can I keep tropical fishes in the same tank as coldwater ones?

Most tropical fishes require a water temperature of 75°-80°F., for their benefit. Coldwater ones can stand water temperatures of as low as 40°F. The usual temperature in coldwater tanks is in the lower sixties F. I do not suggest that many coldwater fishes, especially the fancy goldfish cannot stand a temperature of 75°F., or above but they appear to keep healthier at the lower one. One point to remember is that most tropical tanks need some form of aeration, this is because the warm water holds less oxygen than does cold. Therefore coldwater fishes may be kept in tanks with no aeration at all. Fancy goldfish kept at a high temperature will eat more food and grow more quickly, but they may not live as long as those kept at a lower temperature. My advice is to keep the types in separate tanks and you are more likely to obtain success.

Is it possible to keep Paradise fish in a coldwater tank?

The Paradise fish (*Macropodus opercularis*), can be kept in a coldwater tank. I used to keep and breed them in the same unheated tanks as fantail goldfish. I do not know if any coldwater types can be obtained today but any fish could be easily acclimatised to the required temperature. During the summer months there is no doubt that my tanks in which I kept these fish would get up to a fair temperature, especially with a lamp on for some hours a day over-head. If you obtain any Paradise fish in the summer it would be easy to get them used to a temperature of the lower

sixties F. I found that the fish I bred could stand a water temperature of 40°F., and they just seemed to become rather dormant but livened up immediately the water temperature rose. I do not suggest that the fish are subjected to this level, but I have quoted it to show just how hardy these fish are.

I have a tank, 24 × 15 × 12 inches containing 3 orandas, 1 fantail and 4 Japanese Medakas. The orandas appear to have difficulty in swimming and cannot keep near the bottom. This usually happens in day time but the fish seem all right during the evenings. I feed them on both dried and live foods but the trouble only seems to affect the fish after having eaten dried food. What can I do to improve matters?

The obvious thing to do is to feed with live foods only or soak all dried food before offering it to the fish. Orandas have a short body and so their internal organs are somewhat restricted. If they eat dried food, this swells up inside them and causes some pressure on the swim bladder. I think that you will find that soaked food will not have this effect.

I have a Minnow in a jar and it will not eat. What should I feed it on?

The Minnow will not live long in a jar. The surface area of water is much too small and the fish will not be able to get enough oxygen. The fish, if still alive, should be kept in a proper tank and can be fed on most foods, such as small live foods and flake food. Unless the fish is healthy it is not likely to feed. It is not easy to keep any British freshwater fish in a small container and any river fish, such as a Minnow, is more difficult to keep in good health than fishes from still waters.

I have been trying to obtain a pair of broadtail moors but cannot find any at any of the shops I have visited. Do you know where I can get such specimens?

These fish are usually referred to as veiltail moors as they should be the same shape as a veiltail goldfish but all black in colour and with telescopic eyes. It seems that there are more fantail moors about these days than veiltail ones. I am enclosing an address from which you should be able to get the pair of fish you need.

How efficient is a filter in a garden pond for keeping the water clear? I have in mind one working through gravel.

The efficiency of any filter depends entirely on several conditions. First the amount of water in relation to the volume of water in the pond, which passes through the filter in a certain time. Then the state of the water. If it is very thick with Algae and detritus, then the gravel would soon become clogged and the filter would lose much of its efficiency. Some pondkeepers will install a filter and expect it to function for ever without cleaning out the muck from the gravel. Your remarks about a water-fall performing the same service as a filter are not valid. A water-fall is excellent if it is used as an ornament or to help in reoxygenating the water. This it does by bringing quantities of the water in contact with the air. A fountain can do the same thing but neither will act as a filter.

Do Hydra do any harm to fishes in a garden pond?

Hydra are not likely to harm the fishes but they could kill very small fry. Adult fishes are not harmed by these creatures and some fishes can suck them from their hold and eat them.

Can you possibly supply me with the name of a dealer who can supply me with some of our native fishes, such as: Bleak, Minnows and Sticklebacks?

I do not know any dealer who stocks the fishes you require. The two latter species are usually obtained by boys who net them from streams etc. The Bleak might be obtained through the help of members of a local Angling Society. You could try one or two of the leading dealers who advertise in "The Aquarist".

I shall be grateful if you can tell me how many fish my small son can keep in a tank, 21 × 9½ × 11 inches?

If the tank is 11 inches wide then it will hold 9½ inches of body length of fish but only 8½ if the tank is 9½ inches wide. One should allow 24 square inches of surface area of water for each inch of body length of fish.

After keeping a small pond for some years I am making one 15 × 9 × 2 feet. I am wondering what actual purpose do water snails serve and could you please inform me of their good or bad points. If I include some, how many shall I put in?

I have never found that water snails serve any useful purpose. When very tiny they may be eaten by goldfish but are then not of much value in such small portions. Tench can suck large ones from their shells. Some pondkeepers think that they eat any rotting vegetation in the pond, but I have found that they can eat healthy plant growth as well. They will certainly eat any fish eggs they can find among the water plants. They will also eat any food given to the fishes. Soon after dried food is placed on the top of the water the snails will appear and start to eat it. What they do not eat they soon slime up and so make uneatable for the fishes. Once you introduce any water snails to your pond they may be almost impossible to clear out if you change your mind about them. My advice, do without them.

KOI QUERIES

by Hilda Allen

I have a pond shaped roughly like a figure eight from joining two ponds together with a channel. Overall it measures 60 square feet and is 2 feet deep and contains 12 Goldfish and 6 Golden Orfe. I would like to keep Koi but I am in doubt as to whether my pond is large or deep enough for Koi. I will be pleased if you will advise me on a suitable method of enlarging and deepening it without unduly disturbing the present inhabitants. I could build up the sides with concrete or bricks but am rather dubious about making a watertight seal between this and the Butyl liner. Will you please also advise on the necessity of filtration.

The size and shape of your pond indicate that it is not entirely suitable for Koi and as it is already holding 18 fish I think you would be well advised not to add any more. I think it would be impossible to enlarge and deepen it without first removing the fish to temporary quarters which is what you want to avoid. It is very dangerous to use cement near fish and new concrete must be well scrubbed and washed. Butyl can be successfully joined but this is best "heat-welded" by a specialist firm to make a watertight seal and I admit to not knowing how you could safely bond Butyl to concrete or brick without first removing the fish.

Filtration is usually advised to avoid pollution of relatively small amounts of water in which people can keep Koi in garden ponds. The heavy feeding required, thus producing large quantities of waste matter, can soon pollute a pond, especially during the warmer months and filtration, together with regular water changes, provides a healthy environment without which Koi cannot be expected to thrive and grow.

I have not so far bought any Koi for my new pond but I am puzzled as to what is meant by quarantine and what it entails, duration etc. and I would be grateful if you would explain this.

There are varied opinions on the value or otherwise of quarantine including those who consider it unnecessary but I believe that quarantine is always advisable. Disease is a real problem and epidemic diseases are transferred in water which can be a more certain medium than air in spreading disease organisms. Quarantine means a period of isolation during which Koi can be rested, fed well and treated if necessary; some may die in quarantine, this is inevitable, the cause may be shock or stress from the journey which can produce a number of problems not immediately apparent. The introduction of any exotic disease can be very dangerous and prevention is better than cure, it is easier too. Segregating new purchases makes good sense and has been proved to be worthwhile. Most Koi become very special to their owners and it is hard to lose favourites because of the careless introduction of problems. It is best to have a separate pond for quarantining purposes if possible as ideally a period of several months is necessary in my opinion. Both disease and parasitic infections can lie dormant during the colder months only to flare up as the water temperature rises in Spring and early Summer and any quarantine below about 50°F is of little value. Nets etc must always be kept separately as well.

I am making a Koi pond 24 feet × 11 feet, half of it to be 4 feet deep. I bought 4 Koi from a nursery and keep them in a large aquarium but one now has round, red marks and these seem to be getting worse. This fish is isolated but he looks healthy and is feeding. Can you tell me what the disease is and hour to cure it? I have one Koi book.

The marks may have been caused by parasites such as anchor-worm or fish lice which can cause raw wounds where they attach themselves to the fish. The marks can be dabbed with T.C.P. antiseptic or iodine in more severe cases of infection, it may be necessary to treat daily. The real danger to the fish is that these wounds open the way for the entry of secondary infections. The water temperature can be slowly increased to 70°-75°F and cooking salt added at the rate of ½ ounce per gallon of water. The fish can be kept in this concertration for one week. A variety of treatments are mentioned in books but some of the chemicals or drugs recommended are no longer freely available or even advisable in certain cases. The diagnosis and treatment of fish diseases is a complex and difficult subject.

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 recently began stocking my 36 in. × 15 in. × 12 in. marine tank which was completely matured in two weeks with the addition of coral sand from my old marine tank. I used 3 layers of substrate, crushed shell, fine gravel and sand and coral sand, and a good turn-over of water filtering the tank once every 15 minutes approximately (air operation).

Occupants so far (tank 100% matured):—
1 × Yellowtailed blue damsel 1½ in.
1 × Wrasse (unknown fish) 3 in.
1 × Hermit Crab (medium)
1 × Teak Clown 2 in./× Sebae Clown 1½ in.

Could you recommend an easily available hardy, eyecatching, active and sociable member to go with this community?

What is the capacity of fish and invertebrates allowed for this size tank?

Could I recommend to marine aquarists that they give their fish a wide variety of foods live and dry with a vitamin supplement. My Clowns love *Daphnia*.

An additional fish for your present community.

The nett water capacity (i.e. allowing for displacement by rocks, corals, filterbed, etc.), is probably of the order of 18 gallons. Since you refer to your "old marine tank" I am going to assume that you are not a beginner and may thus be safely advised to go straight to the maximum stocking ratio possible for an undergravel-filtered marine aquarium, i.e. 1 inch of fish to each 2 gallons of seawater. In your case this means that your maximum, sensible stocking limit is 18 gallons ÷ 2 gallons = 9 inches of fish.

You give your present fish stocking level as:

1 × Saffron-blue Damselfish (*Pomacentrus melanochis*) (blue/yellow)	1½ in.
1 × Wrasse (unknown species) (purple and reddy-orange)	3 in.
1 × Teak Clown (*Amp melanopus*) (brown/white)	2 in.
1 × Sebae Clownfish (*Amp. sebae*) (black/orange/white)	1½ in.
Total length of fish	8 in.

We can immediately see two things from the above as follows:

(i) You have only 1 in. of available fish stocking space left!

(ii) Out of all the bright, primary colours, you are noticeably deficient on reds.

I would thus suggest that you purchase a juvenile 1 in. long specimen of either the Fire Clownfish (*Amphiprion ephippium*) or the very beautiful Dwarf Fire Angelfish (*Centropyge loriculus*). Neither of these species will grow very much larger in a tank your size.

What is the ultimate fish/invertebrate carrying capacity of my tank?

With regard to coralfishes, your ultimate limit is 9 in. as stated above. Please note that you are perilously close to this limit already. Now, as far as invertebrates are concerned; provided that you avoid the very active, highly motile invertebrates such as *Octopus spp.*, most of the *Crustacea* (crabs, shrimps, prawns, lobsters etc.) and so on, which need just as much food, produce just as much excretion and deplete the system of just as much oxygen, (in other words, these highly-active, invertebrates constitute just as great a *biological* loading on a system's water management facilities as do fishes, as coralfishes do, then you can virtually ignore invertebrates when calculating any

Continued on page 421

BOOK REVIEW

Tropical Fish by Brian Ward. Macdonald Guidelines. £1.25.

Key to the Fishes of Northern Europe by Alwyne Wheeler. Frederick Warne. Cased Edition £6.95. Limp Edition £4.95.

Brian Ward's book, freely illustrated with good colour photographs and well-executed drawings in colour and line of some 100 different fishes, is certain to prove of great assistance to the beginner in tropical aquarium keeping—freshwater or marine. The author writes with all the confidence and authority of the trained biologist and experienced aquarist. 'If you get all the conditions right (and once you have grasped the general principles it is very easy to do so) your aquarium should look after itself with only the minimum of attention.' So we read in the first section of this book—there are 23 sections all told including a glossary and a 5-page index—and the author is adept in instructing his readers how to get conditions right. Choice of equipment, the art of planting, lighting, maintaining and generally caring for the warmwater aquarium (even during a power cut) and its inmates are among the sections the reader will return to time and time again. A few printer's errors are present. Fortunately they neither rob the text of its readability nor cloud the meaning. *Tropical Fish* is, indeed, a book that can be thoroughly recommended.

Now to something quite different. More than 350 species of freshwater and marine fishes of northern Europe are dealt with in Alwyne Wheeler's 380-page book. It aims to facilitate identification with the minimum of technicality. No-one can say this laudable aim has not been achieved.

The body of the text is arranged in four headings. **Distinguishing features** gives the salient characteristics of each species. **Coloration** gives in brief detail the usual colour, with notes on special colour changes brought about the background, emotional disturbance, ageing, death and so on. **Size** gives the maximum length, weight, width. **Remarks** tells us sufficient about usual haunts, temperature necessary to preserve life, feeding habits, spawning procedure and longevity to satisfy our curiosity or improve our understanding of fishes and their ways of life. The sexes of the different species are given in every case where external differences are plain to the eye. Postage stamp-sized outline maps drawn by F. Rodney Fraser are used to indicate in splashes or narrow ribbons of red the exact distribution of most of the species described. Full marks for the art work of Peter Stebbing. His line drawings of fishes rank among the best I have seen.

Jack Hems

B.K.K.S. NEWS

WHEN THE ANNUAL Pet Fish Show, normally held at the end of October was called off earlier this year, the BKKS Autumn Meeting, usually held in conjunction with this show, was put in jeopardy. Last-moment arrangements were therefore made to book the Small Hall at Conway Hall, Red Lion Square, London, instead. Every attempt was made to let members know of this change in plan and venue but publication date lines being what they are it was thought that quite a lot of people would not be able to make it and the Small Hall would be sufficiently large to accommodate those turning up. By 1.30, however, the hall was practically full and when 2 p.m. arrived extra chairs had to be brought in. So well done BKKS members. Among those I noticed in the audience having travelled a long way to the meeting were several members from Koi East Anglia including Harry Brundish and Kelly Groom, Mrs. Hilda Allen from Peterborough, Lorette and Peter Reynolds from Sutton Coldfield and, of course, our Chairman Roland Seal and his wife Pauline from Stockport.

A projector and screen had already been set up in the morning whilst London BKKS members held a committee meeting in the hall and London Section Chairman Ralph Johnson was first to kick off after Roland Seal had welcomed members and formally opened the meeting. Ralph is now the Society's official photographer and had two excellent colour films with soundtrack to show. The first film was in two parts, Part I a pictorial account of the London Section's summer visit to members of Koi East Anglia and Part II of the London Section's Open Koi Show at Ware this year. The second film was of "Koi '78"—the third National Open Koi Show held at Tatton Park this year.

Both films had been beautifully put together with some terrific close-ups of Koi and some candid shots of members taking part caused quite a bit of merriment in the audience. We all look forward to seeing more films of this quality and warmly congratulate Ralph on his initial efforts in this field.

Roland then gave an impromptu talk on "Koi-Keeping"—what he refers to as his "busking" act. Roland "busking" can be extremely entertaining and informative and it had to be pointed out that if a break wasn't taken soon the tea would be cold before members would temporarily let him go. After the always-welcome tea-break organised as usual by Mrs. Gray, Roland continued with his talk followed by animated questions from the audience. Again, this had to be forcibly brought to a halt so that another film could be shown, this time a mouth-watering collection of Japanese Koi taken in ponds and at shows in their native country, with a "live" commentary by Roland.

Altogether a very entertaining and worthwhile meeting which had to be finally wound-up when it was pointed out by the caretaker that we had seriously over-run our time.

Valerie Frost.

From a Naturalist's Notebook

by Eric Hardy

1978 WAS A good year for grass-snakes in south Cheshire, further refuting an erroneous claim of "an absence of recent records" in the Systematics Association's 1974 book on The Changing Fauna and Flora of Britain. As well as the Wybunbury Moss ones I mentioned, one of several garden visitors entered a friend's Church Minshull farmhouse in October. More interesting is the continued presence of the adder in Cheshire. Visiting the Birch Covert reserve on the edge of Carrington Moss beyond Sinderland Green, now in the Greater Manchester area, I was told by the warden of 2 or 3 sightings there recently.

London Natural History Society records the adder still at Coppett's Wood, Barnet, and grass-snakes at Potters Bar, Bookham Common and Sewardstonebury (Essex). They also note marsh-frogs by the Thames at Kew Gardens and all 3 newts, crested, palmated and smooth, at Bookham Common (Surrey). Equally interesting is their recording of rainbow-trout recently just below tidal Teddington Weir, at Tilbury Dock, West India Dock, by the Royal Naval College at Greenwich, Putney, Sunbury (Middlesex) and in highly saline estuarine water at Leigh-on-Sea creek and near Gravesend ferry. These probably originated from stocks in London area reservoirs; but their recordings downstream from Teddington Weir suggest, states the British Museum's curator Alwyne Wheeler, that "there must be a substantial number living in the river." By the way, NERC recently granted £18,203 over 3 years for an Aston University study of rainbow-trout reproduction.

Thames Crabs

Their report on invertebrates in the London area rivers includes recent records of Chinese mitten-crabs in the Thames at Teddington. Though caddis-fly larvae are numerous in the Thames, except its silty parts, only two "may fly" Ephemerids were found, *Caenis moesta* and the small *Cloeon dipterum*. In contrast, 12 species were found in the River Darent (Surrey). Pondsnails are most varied in the Rivers Cray and Wandle, and even the Grand Union Canal's Paddington Arm. Included in the latter is the American *Menetus dilatatus*, which is also in the canal at Brentford, the first record more than 32 km from where it was first found in Britain near Manchester in 1869.

Russian herpetologists, Darevsky and Shcherbak, recently described a new species of lizard, *Eremias andersoni*, from Persia. In more work on orientation or homing, Miami University biologists Taylor and Adler link the pineal body or degenerate "third eye" of the tiger-salamander with extraocular perception of sun-clues, while DeRosa and Taylor of the same university have shown a sun-compass orientation is used by the painted turtle. Perrill, Gerhardt and Daniel of Butler University, Indianapolis, found a curious "parasitism" of sex behaviour in green tree-frogs, which some other vertebrates use. Non-calling adult males associated with some 16% of the calling males in a pond, and intercepted and mated with females moving towards the calling males.

31 species of venomous snakes have been listed recently in South Africa, 11 of them vipers, 16 elapids and 4 colubrids. At Dallas Zoo, Texas, green tree-pythons have been observed to use their tails to lure prey. M. Peaker of Britain's Agricultural Research Council has described a probable salt-gland in terrestrial tortoises as *Testudo carbonaria* excretes potassium from its orbital region. Salt-glands are usually nasal and found in sea-going turtles, snakes and birds.

Several birds have been observed killing frogs, from herons to small ones taken on occasion by a blackbird; but a Danish ornithologist observed the reverse when a very small bird, a goldcrest, was killed by an edible frog.

Pup Fish

In 1970 I mentioned the Tecopa pupfish of Death Valley, California being placed on the endangered list. The last 200, isolated for 20,000 years in small salty pools and hotsprings in limestone caverns were threatened by a bathhouse built 30 years ago, drawing off their water, making the flow swifter than they were adapted to tolerate. Predatory fish were also introduced. Since then, biologists have failed to find any left, or any of the Shoshone pupfish either. The irony is that the bathhouse went bankrupt years ago and is deserted, reports the American Audubon Society, a conservation body of which I am a member. Twelve varieties of pupfish exist in the U.S.A.

At this autumn's salmon-spawning on the North Wales Dee, only a few fish had the ulcerative dermal necrosis disease, but nothing like so widespread as gained public attention from many rivers a few years

ago. In America, wild duck have recently been proved to transmit whirling disease of trout and other salmonids. I recently received from the Ministry a new 3-page Fishery Notice No 60, *Bacterial Kidney Disease (BKD) of Fish*, by D. Bucke from the Fish Diseases Lab. at Weymouth. This infects salmons and trouts fatally, often causing swollen eyes and abdomen, occasionally small ulcers with small red or white spots or blisters; but the causes of infection are unknown. It is a notifiable disease. Notice No 59, *Disinfectants in Fish Farming* (7 pages), by J. Finlay of the same lab, covers the use of chlorine, sodium hydroxide, iodophors, ammonium compounds and calcium oxide (where whirling disease has occurred) all disinfectants for a range of things, like salmon and trout eggs, some being toxic to fish yet not their eggs, others corroding aluminium.

Dragonflies

A colour-photograph of the distinctive, slate blue, flat-bodied declining southern dragonfly *Libellula depressa*, which a friend took to confirm his observation of a pair at a Wirral, west Cheshire, pond last summer, was interesting because Curwen's recent work on British dragonflies maps this broad-bodied, brightly blue aquatic insect no nearer than the Midlands and an old record above Chester. It has been a good year for aquatic plants too. Even in Greater Manchester I was interested in water-violet (which isn't a violet) growing in the far pond in Brookheys Farm Covert, near Sinderland Green. In my annual week of field-studies among the Norfolk Broads at the end of September, I was pleased to see so much bladderwort flowering yellow in the dyke on Barton Broad, reached from the public staithe below Fennside, Catfield. On land, small-flowered catchfly by the way was growing behind Walsey Hill at Cley, and creeping ladies' tresses at Edgefield Heath.

The manufacturing trade may well deny the pollution of Norfolk Broads; but it is not borne out by scientific surveys. 11 out of 28 broads have lost all their specially interesting vegetation; a further 11 have only water-lilies of note. As the higher aquatic flora deteriorates, algae bloom, to cloud the water and invertebrates disappear. Barton Broad, once a clear water reserve is a pea-soup ecologically poor home of biting midges. This eutrification is due to the increased dumping of waste nitrogen and phosphorus by mainly houseboats, stimulating the algae to outpace all other plants. An industrial challenge to my statement the other year, of providing evidence of a firm's researches making an astonishing scientific breakthrough proving no pollution or oxygen-depletion, just has not arranged a single date when I can interview the lab or "scientists" claiming house-boat toilets do no harm. That wasn't why Oxford University got a £2,908 grant to study conservation of Cothill Fen's declining vegetation.

Which brings me to the final point, of how much the state is paying for serious research. The National Environmental Research Council recently granted £15,056 for a 3½ years' study of the feeding behaviour of pike by Dr P. J. B. Hart of Leicester University; £6,865 for Dr I. G. Priede of Aberdeen University to track basking sharks by satellite and £8,372 for a 2 years study at the same university of the feeding, growth and reproduction of the octopus; £5,519 for a year's study at Liverpool University of pollution-recovery by canal waterweeds; £4,044 for a population study of Aldabra's giant tortoise and £11,717 for a 3 years' study of crayfish by a Durham University biologist. Crayfish were common this autumn in tributaries of the Lakeland Eden at Ormeside by the way.

£5,260 went to a year's study of a new variety of *Daphnia magna* at Imperial College, London and £5,399 for a Bangor University study of algae in 2 Snowdonian lakes later to be developed by the CEGB. Meanwhile, amateurs in serious investigations seldom have access to funds and their work, so often exploited by professionals, is limited by their heavy expenses. One Scottish university researcher receiving over £10,000 research grant wrote recently to me for a life's work information on the same subject, without even enclosing a s.a.e.

Hermit Crab

COLDWATER MARINE AQUARIUM

By Ian Fry

IF YOU ARE considering setting up a marine aquarium, why not think about trying coldwater marine, instead of tropical? I've been keeping a wide variety of fish and invertebrates from British waters and the longer I study them the more interesting they become.

The sheer variety of suitable specimens is far greater than can be found in shops selling tropical marines, and of course one look at the price of stocks gives one good reason for setting up a coldwater tank. Of course, one may say that the tropicals are far more colourful than the specimens found round our coasts, but I've found that there are many beautifully coloured if more obscure coldwater species suitable for the fish tank. The fearsome looking blue and red Squat Lobster (*Aalathea strigosa*) makes a colourful addition to the tank. I feed one which I have on winkles and other shellfish, which I collect on the beach and store in the freezer. Unfortunately, it likes to hide under rocks, but can be kept in view by building a cave for it against the front of the tank. The specimen in the photograph has lived in the tank for 8 months and during this time has shed its shell twice. When this occurs it leaves behind a perfect replica of itself, antennae and all—leading one to think that the creature has died.

One fish which has an almost tropical look, is unbelievably hardy and will eat anything is the *Ballan wrasse* (*Labrus bergylta*). This thick set fish is found on rocky shores and at a small size (15 cm.) they are suitable for the aquarium, although they rapidly become too large and destructive. One which I found stranded in a rockpool was particularly colourful with a greeny brown body spangled with blue, and a blue and red striped head. Ballan wrasse will not fight with other fish, but cannot be trusted with any crustaceans or molluscs. They are relatively intelligent as far as fish go, and if they know that a small crab has been introduced to the tank, will not rest until it has been rooted out and eaten. I once put a dozen or so large prawns and a crab into the tank, thinking that would eat the odd one when it got hungry. The next morning

revealed that the wrasse had spent a busy night overturning rocks which weighed up to 4 kilos and heaping gravel into the corners in its successful efforts to eat every prawn. I eventually returned it after a year to the sea, when it weighed almost half a kilo. It has been replaced by two smaller and less destructive Rock wrasse (*Ctenolabrus rupestris*), which only make half hearted attacks on tubeworms, etc., unless they aren't fed properly.

Sea anemones have a great diversity of colours, and most of the common varieties are easy to keep—a lump of fish or meat every two days suffices. Commonest are the red or green, blue spotted Beadlet Anemone (*Actinia equina*) which grows to around 7 cm. across. Much larger is the red and pale pink Dahlia Anemone (*Tealia felina*) which grows to the size of a dinner plate. Unfortunately, they spend a good deal of their life half closed, showing their warty bodies.

Some anemones when introduced to a new environment, seem keen on wandering around the tank, a habit which sounds hilarious for such an inactive looking object. The medusa-like Snakelock Anemone (*Anemonia sulcata*) is especially restless, and it is annoying to find that when you look at the tank in the morning, one is sitting on top of the filter outlet, or perhaps stuck conspicuously on the glass in the front. This wandering can also lead to a sort of territorial war between different species. I've seen one snakelock anemone moving unknowingly towards a Beadlet, which swelled itself to an unbelievable size to ward off the intruder. The Snakelock also has a tendancy to split itself in half, forming ever increasing numbers, when it is well fed.

A very interesting anemone which I was lucky enough to obtain is the Cloak Anemone. This beautiful species has a cream coloured body with blue spots, and white tentacles. It grows only on the shell of a hermit crab, but can be abandoned when the crab outgrows its home. It has the quickest feeding actions of any anemone, no doubt due to its evolution with the quick moving Hermit crab, where it needs instant reflexes to snatch morsels of food the crab has missed. Hermit crabs themselves are easy to keep as long as the water holds no trace of nitrites. They are useful active scavengers, cleaning up any scraps left by the fish. A

Ballan wrasse

Sea mouse (*Aphrodite aculeata*)

good feed of shellfish should be given, though, every few days. They also need a supply of empty snail shells, to change to as they outgrow their own.

The small, green or Purple tipped urchin (*Psammechinus miliaris*) found under stones in rockpools, make a colourful addition to the tank. If only two or three are included they keep down the masses of filamentous algae, without too much damage. Once a week, some red sea weed, or even cabbage and small pieces of raw fish will keep them healthy.

Of the starfish, only Brittle stars and the small inactive Cushion stars, should be kept unless you wish to see your shellfish vanishing swiftly. Brittle stars display a wide variety of colours from velvet-black to white and also orange, reddish and brown forms are common. They like to lie behind rocks with their arms exposed waiting for food. Their actions are remarkably fast compared to other starfish, and when food is within reach will crawl sinuously out, snatch it up and roll their arms around the prize swiftly stuffing it into the mouth.

An interesting mollusc which scavenges in the tank is the porcelain like Cowry (*Trivia monacha*). It is found at low tide feeding on sea squirts, though will eat meat in captivity. Usually it covers the glossy shell with its striped mantle, which seems to be poisonous—none of the other aquarium inhabitants have ever attempted to eat it.

One of the oddest and most gorgeously coloured invertebrates is the Sea mouse (*Aphrodite aculeata*). It is very occasionally found on the low tide mark in muddy sand. The mouse shaped body has a pelt of brownish fur on the back, while the sides are covered with long iridescent hairs which gleam in metallic gold, green, yellow and blue. However mouse like the animal may look, it is in fact a member of the generally insignificant looking Scaleworms.

The specimen in my aquarium is kept mainly for interest's sake as it burrows into the gravel and is never seen unless I dig it up, as I had to do to take the photograph.

These are just a few examples of the more colourful

Continued on page 418

WHAT IS A SPECIES?

by C. Storey & J. Rogers

IN ANY EDITION of the 'Aquarist' one continually comes across references to many different species such as *Poecilia reticulata*, the guppy; *Symphysodon aequifasciata*, discus; *Balistoides niger*, the clown triggerfish; *Amphiprion percula*, the common clownfish to name but a few. But have you ever given thought to what it means when a group of animals is designated a species, and is given a specific name?

Naming a Species

The process of naming a species is a fairly simple one. The name itself is made up of two words. The first is the generic name, the name of the genus to which the animal belongs, and the second is the specific name. Taking *Cichlasoma meeki*, the Firemouth cichlid, as an example, *Cichlasoma* is the generic name and *meeki* is the specific name. Since there can be many species within one genus they will all share the same generic name. However, the combination of the generic and specific name, known as the binomial epithet, is unique—no two species share the same name.

When a taxonomist is describing a new species he may decide that it belongs to an existing genus and so the new species takes the name of that genus but it is provided with its own specific name. The taxonomist is at liberty to call the species by any name he wishes provided that the name has not been used before and that it is latinised. This also applies to the creation of a new generic name when a new animal is discovered that does not belong to an existing genus.

Usually the name chosen is descriptive of the animal. *Symphysodon discus* is the Latin name of the Heckel discus and Heckel gave the fish the specific name of *discus* because of its shape. The generic name, however, is a composite of two words, symphysis meaning a joint or growing together of parts, and odus meaning tooth. *Symphysodon* therefore refers to the fact that the fish have teeth on the symphysis of the lower jaw.

Occasionally a taxonomist names a species in honour of a person. An example of this probably known to most is that of *Cheirodon axelrodi*, the Cardinal tetra named, of course, in honour of Dr Herbert Axelrod.

The name of an animal consists then of a generic name and a specific name, and to be strictly correct it should be followed by the name of the authority who described the species and the year in which the description was made, e.g. *Symphysodon discus* Heckel 1840.

Name Changes—The History of the Guppy

One aspect of naming a species that produces confusion is when the name of a species is changed. Although such changes may seem unnecessary to the lay person there is usually a good scientific reason behind the alterations.

In 1859 the German ichthyologist, Wilhelm Peters, described a new species of fish from Venezuela. He considered the fish belonged to the genus *Poecilia* and he named it *Poecilia reticulata*. Then in 1861 de Filippi described some fish from Barbados. In his opinion they were distantly related to other members of the *Poecilia* genus so he created the new genus of *Lebistes* and called the fish *Lebistes poeciloides*. Five years later in 1866 Albert Guenther described yet another new species of fish and called it *Giradinus guppyi* (or *ii*). Finally, in 1913 C. Tate Regan of the British Museum made a study of the sub-family *Poecilinae* and decided, principally on gonopodium structure, that *Poecilia reticulata*, *Lebistes poeciloides* and *Giradinus guppyi* were all one species. At the time the fish was known to most English and German aquarists as *Giradinus*

guppyi and the common name of guppy has persisted to this day. However, Regan was bound by the international rules of nomoculture to choose the first name under which the species was described i.e. *Poecilia reticulata*. But Regan agreed with de Filippi that this species was not closely related to the genus *Poecilia* and so it would be wrong to place the fish in this genus. Therefore the genus of *Lebistes*, created by de Filippi, was used and the fish became known as *Lebistes reticulatus*. The change from *reticulata* to *reticulatus* was made on grounds of gender.

This was the situation up until 1963 when Rosen and Bailey made a further study of the poeciliid fishes. They decided that the guppy did bear quite a close relationship to other members of the *Poecilia* genus and so it was placed back into its original genus. This is as far as the story goes and today the guppy is *Poecilia reticulata* Peters 1859.

What is a Species?

Although the naming of a species is a fairly simple matter, deciding whether a group of animals belongs to an existing species or constitutes a new species is no easy affair and brings us back to the original question of what is a species?

The original idea of a species, upheld by Linnaeus and derived from the philosophies of Plato and Aristotle, is what is now called the morphological species concept. In this, a species is a group of animals that is morphologically distinct from other groups of animals or, as C. Tate Regan put it in 1926, 'a species is a community or number of related communities where distinctive morphological characters are, in the opinion of a competent systematist, sufficiently definite to entitle it or them to a specific name.' That is to say, a species is defined on its degree of morphological distinctiveness. Typical morphological characters used for fish are the number and type of fin rays, the number of scales, body colour, body shape and so on. In fact, any body character can be and probably has been used to separate one species from another.

Intuitively this may seem to be a good basis on which to distinguish a species but when this idea is applied several anomalous situations become apparent. These include situations where there is:—

(a) morphological difference between the sexes.
(b) polymorphism and geographical variation.
(c) differences in life history stages.

(a) Morphological difference between the sexes

This is known as sexual dimorphism and is exhibited by many species. Aquarists will well be aware of the large degree of sexual dimorphism shown by the livebearers, especially the guppy and swordtail. If the morphological species concept is strictly applied then one encounters the ridiculous situation where males and females would be considered separate species. Clearly this is wrong, but this mistake has occurred in the past. Mallard ducks show a large degree of sexual dimorphism and when originally described by Linnaeus the female was named *Anas platyrhynchus* and the male *Anas boschas*. It is evident that he was unaware he was dealing with the male and female of one species.

(b) Polymorphism and geographical variation

The problem mentioned above also arises when there is polymorphism and geographical variation. Polymorphism is the occurrence of different forms of the same species in the same area. A simple example of this is eye colour in humans—blue eyed, brown eyed, grey eyed people all occur in the same area.

Geographical variation is the occurrence of different forms of the same species in different areas and an example of this can be found in the May edition of the 'Aquarist' 1978 where Valli Bookless describes the geographical variation of *Tropheus moorei* in Lake Tanganyika.

The guppy is a very variable species showing both polymorphism and geographical variation in body colour, and this probably goes a long way to explain why it was described as a new species on at least three different occasions.

(c) Differences in life history stages

Differences in life history stages have also proved a source of confusion. Many crustacea have larval stages which are very different from the adult form. Krill, that well-known food of whales now tinned for feeding marine fish, have several stages in their life history. The ninety or so species of krill belong to the order *Euphausiacea* and they hatch from an egg to a nauplius larva. This stage moults to the more developed metanauplius which is followed by the Calyptopis, Furcilia and Cyrtopia stages before becoming an adult. When originally discovered the Calyptopis, Furcilia and Cyrtopia stages were not thought to be larval stages but species in their own right. It was only when the full life history became known that the mistake was discovered and the names are now only retained to describe the different larval stages. This was a frequent occurrence in many of the crustacean groups before life histories were studied.

The point to be emphasised is that morphological differences that can occur between members of the same species are often sufficient, on the basis of the morphological species concept, for more than one species to be named.

Sibling species

The other side of the coin to there being large variation within one species is the lack of variation sometimes found between two species—in fact there are species which are morphologically identical. Such species are termed sibling species, and they have been found to occur in all groups of animals being fre-

Continued on page 420

Squat Lobster *(Aalathea strigosa)*

continued from page 415

inhabitants which should interest the budding marine aquarist. Except where I've stated, all the animals mentioned will live peacefully together. Over a few years, I've learned by trial and error—with a few unfortunate results, which creatures will live together. Of course, some cases are obvious—it would be foolish to keep a large starfish with a tank of bivalves, or a coelenterate-eating sea slug with anemones. If you feel experienced enough to keep offshore species such as cod or Norway lobsters, the best way to obtain these is to find your nearest marine research station where they have marine life for sale. Most of their livestock is priced-listed for sale to universities, etc, so don't expect to come away with armloads of free, rare animals.

If you plan to build your own tank from scratch, as I did, make an all glass one, glued together with silicone adhesive. This is immensely strong, non toxic or corrosive. My tank was built from 6 mm glass (sides) and 10 mm for the base. A 5 cm. wide strengthening strip runs round the top, inside. It is 130 cm. long with a 120 litre capacity. The only filtration comes from an undergravel system powered by two large diaphragm pumps. This give a very fast turnover rate, needs no maintenance and keeps the water crystal clear. The lighting comes from a three foot, cold colour fluorescent tube. Originally I made up seawater from bags of marine salt bought from a pet shop. Now I change the water using fresh seawater from the local beach. In spite of dire warnings against this practice, no ill results have occurred, though I wouldn't advise it for filling a new tank. When a tank is set up, have the filters running for most of the day for a week. Then add a small weed-covered stone to the tank to seed the gravel with bacteria and algae. Fish, etc., can be added soon after this, but remember that the undergravel filter works by using a vast population of bacteria to break down poisonous animal waste. It takes more than a month for the bacteria to build up sufficiently, and until this occurs *never* overfeed or leave dead animals in the water for more than an hour.

continued from page 417
quent among fish and amphibia. For example the leopard frog, originally thought to be the one species *Rana pipiens* has, upon detailed investigation, turned out to be a complex of sibling species. Another example, to be found in the insect world, is that of the mosquitoes belonging to the genus *Anopheles*. Originally it was thought there was only one species but now it is known there are six. They have been separated on their behaviour, ecology and chromosome arrangement.

The important feature of sibling species is that they are not discernible using morphological characters and so once again the morphological species concept proves inadequate.

Biological species

What criteria can be used then if morphological differences are not valid ? This leads us to the biological species concept which started life in the first quarter of this century and has been gaining ground ever since. In this a species is a group of animals that is reproductively isolated from other groups of animals. A more formal defination, based upon this concept by Ernst Mayr, is 'Groups of actually or potentially interbreeding natural populations which are reproductively isolated from other such groups'. The important phrase is reproductive isolation. Members of one species, under natural conditions, do not breed with members of other species, that is to say, they are isolated from each other reproductively. Reproductive isolation is ensured by various methods termed isolating mechanisms. These can be conveniently split up into six categories.

(i) The members of two species do not meet and so do not have an opportunity to mate. This could be due to living in different habitats or the two species may be active at different times of the year. Activity at different times of the day is also important. A nocturnal animal would not meet a diurnal animal and so they would be unlikely to mate.

(ii) The members of two species meet but do not mate. Mating is prevented due to differences in the behaviour patterns of each of the two species. This isolating mechanism is thought to be the most important of all and explains why so many species have elaborate courtship rituals.

(iii) The genitalia of the two species are not compatible and this results in mechanical isolation. This is commonly called the lock and key mechanism and is only important in species which have internal fertilisation. The female genitalia form the lock and the male genitalia form the key and for successful copulation to occur the male and female genitalia must be compatible.

This mechanism does not apply to egg laying species of fish but it is important in the live bearing species.

(iv) If two species do mate then the gametes, i.e. eggs and sperm, may be incompatible and in such cases the sperm dies before the eggs are fertilised.

(v) If fertilisation of the egg does occur then the embryo may die.

(vi) Should the embryo survive then the offspring may be of reduced viability or sterile or both.

The best way of looking at isolating mechanisms is to think of them as a series of barriers where if barrier (i) is overcome then barrier (ii) will come into play and so on.

Not all species have the isolating mechanisms mentioned. For example, egglaying fish do not have mechanical isolation (iii). The sterility barrier (vi) was originally thought to be very important but it is now known that many species can interbreed and produce viable, fertile offspring when the other isolating mechanisms have broken down due to unnatural conditions. For example, offspring from a mating between *Symphysodon discus* and *Symphysodon aquefasciata* are fully viable and fertile and are therefore able to breed.

Hybridisation

Methods to ensure isolation are varied and far reaching so why then do aquarists report, albeit infrequently, hybridisation between two species ? The cross breeding of the two discus species mentioned above is an example of this. Offspring have also been produced from crosses between *Xiphophorus helleri*, the swordtail, and *X. maculatus*, the Platy and, more rarely, from *Poecilia reticulata*, the guppy, and *P. sphenops*. Successful matings have also been reported between *Aequidens portalegrensis*, the black acara and *A. latifrons*, and *Cichlasoma nigrofasciatum* and *C. meeki*.

In such cases the isolating mechanism which has broken down is usually the behavioural one. This is because although aquarists keep their fishes in the best conditions possible, and often go to great lengths to duplicate conditions found in the wild, the tank situation is nevertheless very unnatural and the ecology of the fish becomes altered. Tank bred fishes are often raised by artificial means, away from their parents and it is common practice when rearing live bearers to raise the sexes separately. The effect this can have on reproductive behaviour is illustrated by the raising of male guppies in isolation and then placing them with females of their own and other species. Such males will court females of some of the other species more vigorously than they will their own. In this situation the behavioural isolating mechanism is clearly on the way to breakdown although in time the males do learn to court only the female guppies since it is from them alone that they receive the correct sexual response.

Fishes are often kept in community tanks and it is not uncommon for a fish to have no mate of its own species with which to breed. In such circumstances the fish may resort to breeding with a closely related

species and even in the wild this would be the optimum behaviour for the lonely fish.

Usually hybridisation only occurs between two very closely related species as these often share a proportion of the behavioural sequences which are performed prior to spawning or copulation. The chromosome and gene arrangements are also more compatible in closely related species. Most reports of hybridisation are between members of the same genus although intrageneric matings are known to occur. For example, a cross between *Cichlasoma nigrofasciatum* and *Geophagus brasiliensis* was reported in 'What Is Your Opinion', Feb. 1977.

If we survey the occurrence of hybridisation in the wild we find it is a very rare event although it is more common in fish and amphibia than in the rest of the vertebrates. When it does occur it is often the result of changes in the natural habitat of the species. Such changes are usually brought about by man and they induce changes in the ecology of the species. This is somewhat analogous to the tank situation where animals are placed in unnatural environments.

Although we have diverged somewhat from the original question the discussion of isolating mechanisms and their breakdown should make the biological species concept easier to understand. But we cannot discard the use of morphological characters since they still form the basis for the description of a species and are used in keys for identification. However, it is the biological species concept which is used to decide whether a group of animals constitutes a species. The occurrence of sibling species validates the use of this concept since such species cannot be detected using morphological features. They are only recognisable on ecological and/or behavioural differences. It must be emphasised that sibling species are no different from other species, they merely represent one end of the spectrum of the degree of morphological difference between two species.

Charles Darwin, as surely everyone knows, wrote the 'Origin of Species' and yet even he did not have a clear idea of the nature of a species as his definition so obviously shows 'the term species . . . is . . . one arbitrarily given for the sake of convenience to a set of individuals closely resembling each other'. As you can see we have come a long way since then.

MARINE QUERIES *continued from page 409*

given tank's maximum stocking capacity. The only critical factor then becomes the available volumetric space within the system. Thus, if you buy only anemones, living corals, hydroid polpys, alcyonarians, ascidians, tunicates, starfishes, sea-urchins, feather-stars (=Crinoids), tubeworms, gorgonians and so on, you can, within reason, accommodate as many of these sessile and semi-sessile organisms within the system as you have shelves, caves, ledges etc., to place them on.

Regarding your fish-stocking, I have dealt with this above.

Live-foods. I am quite certain that you are sincere in the recommendation you have given concerning *Daphnia*, etc. However, I feel that equally sincerely I must stress to all readers that the only live-foods which have *never* transmitted pathogenic organisms and ecto/endoparasites to my aquaria (marine and otherwise) are clean, fresh, red earthworms and hygienically-cultivated whiteworms. I ascribe this occurrence to the fact that being the only non-aquatic organisms commonly used as livefood by fish-keepers, they neither harbour nor transmit aquatic pathogens and parasites.

Lectures for Aquarists' Societies

SLIDE ILLUSTRATED

1. Catfish . . . to include Corydoras.
2. Botias, Loaches and Eels.
3. Fishkeeping for the beginner.
4. Fishkeeping for the advanced aquarist . . . to include Discus keeping.
5. Rift Valley Cichlids . . . Malawi and Tanganyikan.
6. Cichlids of the World . . . except Rift Valley.
7. Characins of the World.
8. Aquatic Quiz . . . a fishy quiz using slides for questions.
9. Fish photography from the basics.
10. Construction of an Economic Fish House.
11. Judging in the British Isles and America.
12. Aquarium Shows in England and America.

DEMONSTRATIVE TALK; (No slides to date).

1. Diseases of Tropical Fish.
2. Aquarium Water Chemistry . . . from the hobbyists standpoint.
3. Foods and Feeding.

Societies interested in inviting the given of the above lectures should contact Dr. P. A. Lewis, Milesgarth, Cawcliffe Road, Brighouse, West Yorkshire. HF6 2HP. Tel. 0484-711383.

Breeding
Lamprologus brichardi

by Jørgen Hanson

LAKE TANGANYIKA IS something of a paradise where cichlids are concerned. One of the most well-known is *Lamprologus brichardi* which has thrived in European tanks for at least a decade.

The *Lamprologus* genus with its more than 50 species is the largest genus of cichlids in Lake Tanganyika, but is, as opposed to e.g. *Julidochromis*, not endemic to this lake. No cases of mouthbrooding have as yet been reported in *Lamprologus*; the small species often spawn in snail shells.

Lamprologus brichardi was described as relatively late as 1952 by Poll and Trewavas and was, until 1974, regarded as a subspecies of *Lamprologus savoryi* under the name of *L. savoryi elongatus*. The fish has a somewhat elongate body form and attains a maximal length of 10 cm. The body colouring is a light beige with a spot in the centre of each scale varying in colour through grey and yellow to reddish. A black band runs from the eye to the gill lid which has itself a black spot on top of which is a slightly smaller yellow spot. Beneath the eye on a paler background there is a very delicate patterning in yellow and iridescent blue. The uppermost and nethermost rays of the caudal fin are extended and white in colour. The posterior rays of both the dorsal and anal fin are likewise extended and the outer edge of these fins together with the anterior edge of the ventral fins are coloured white.

Continued on page 424

Lamprologus brichardi showing white edged fins fully spread.

continued from page 422

I have kept *Lamprologus brichardi* on two occasions, as the first time was not a success. I bought four adult specimens and placed them in an especially arranged tank and a couple of months later there were none left due to the unfortunate fact that we had placed four *Julidochromis ornatus* in the same tank, one of which either worried all the other fish in the tank to death, or forced them to leap out of the tank.

On the second occasion I acquired nine young *Lamprologus brichardi* about 3 cm in length from a friend who lacked tank space in which to feed them up. I placed these together with a brood of about 50 young *Pseudotropheus auratus* 2 cm. in length; nonetheless, after the course of two months the *P. auratus* young measured 6 cm. while the *L. brichardi* measured 5 cm.

At this stage I reckoned that the time was right to attempt to find a compatible breeding pair, so I transferred the nine *L. brichardi* to a 50-litre tank with a system of caves built up close to the front glass by means of slate and with some alternative nooks and crannies along the back glass. The rest of the tank was filled with a dense mass of *Vallisneria spiralis*.

I fed the fish alternately with living food (brine shrimp, mosquito larvae, *Cyclops*) and dry food. In the course of a very few days it was evident that a pecking—order had been established. The largest of the fish had occupied the caval system while each of the others had its own small hollow elsewhere in the tank. I was obliged to remove the smallest of the fish due to its persecution by all the others and no sooner had I done this than another fish was made the scapegoat.

A month after transfer to the new tank, an amount of gravel could be seen to have been dug up at the front of the tank, and another fish was allowed into the territory of the dominant fish. Two days later the fish were in full swing with a spawning, an ovipositor being evident in the larger fish which we thus deemed to be the female. I noted the following:

25.12.77 75 eggs spawned on the lower side of the slate forming the roof of the cave system. The eggs are yellowish-white and sticky and about 2 mm in diameter. Both male and female attend to the eggs.

27.12.77 Two of the eggs fungused and the rest have two dark points in the middle.

28.12.77 As the eggs hatch, the female carefully plucks the young from the roof and spits them into a narrow crack between two bits of slate. The crack is so narrow that the female can only enter halfway and then only by swimming sideways.

20.12.77 Eye pigmentation developed. There is a golden ring around the dark pupil. The two remaining fish in the tank are now allowed free access to the cave.

2.1.78 The young are now all down at the bottom of the cave, where they lie so close to the gravel that they are almost impossible to perceive. They are apparently not as yet free-swimming.

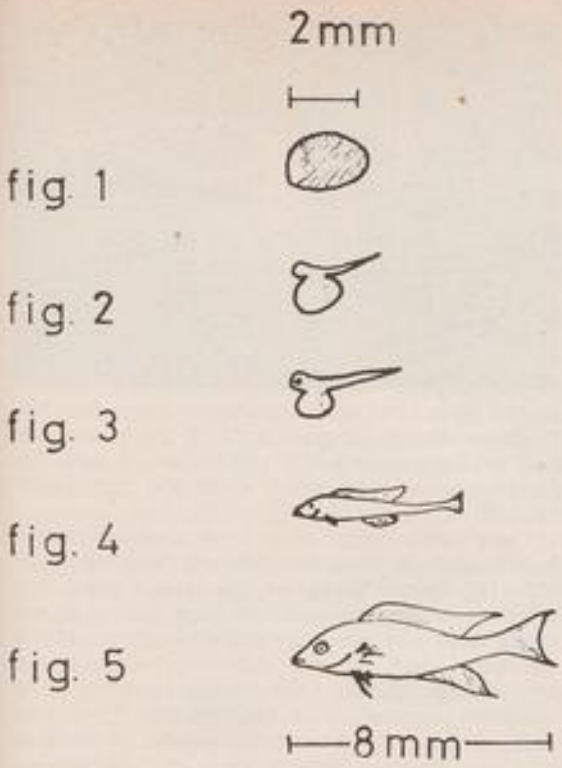


Fig. 1 The egg on the first day. Fig. 2 On the third day the egg hatches and head and tail are discernible. Fig. 3 On the fifth day eye pigmentation develops. Fig. 4 On the ninth day the fry is free-swimming and measures about 5 mm. Fig. 5 A week after the free-swimming stage, the fry measures about 8 mm.

3.1.78 The fry swim freely just beside the cave opening. Both the parental fish and the fry accept brine shrimp avidly. The fry are about 5 mm in size and completely light coloured. They keep closely to the bottom as opposed to *Julidochromis* fry which swim with belly pressed toward the cave roof.

10.1.78 The fry are now swimming farther away from the cave, and accept dry food.

6.2.78 A new spawning within the cave. The first brood are still cared for by the adult fish; every time a shadow falls over the tank the fry hide at the bottom.

22.2.78 A new spawning.

L. brichardi is found in nature in large flocks of from 50-100,000 individuals by rocky coasts, where they when threatened seek shelter in the innumerable caves. The *L. brichardi* tank should therefore contain as many caves as possible. *L. brichardi* will only dig in the tank in order to improve the cave system and does not touch plants.

The water in our *L. brichardi* tank was taken straight from the tap (pH 7, DH 14). The water temperature was 27°C. and the tank was constantly illuminated by a Philips fluorescent tube colour 32. There was constant filtration by a slow driving filter.

One can usually ascertain when a spawning is imminent as the female's girth is more extensive than usual and some gravel is generally removed from the cave.

BOOK REVIEW

Key to British Freshwater Planktonic Rotifera. By Rosalin M. Pontin. (Freshwater Biological Association, £3.50).

This 178 page, illustrated key to 199 of more than 800 very variable British rotifers is essential for anyone who has not access to Hudson and Gosse's famous old work on these tiny, transparent animals, whose heads whirl with wheel-like rings of mobile, hairlike cilia and for all the world remind one of the end of a modern electric shaver. These mostly female wheel-animalculae, reproducing parthenogenetically, inhabit local ponds where they attach to pondweed, occupy roof-gutters and ditches, and are used by aquarists who breed tropicals to feed young tank-fish between their *infusoria* and *Daphnia* stages. Without a good key like this, it is difficult to identify them. Apart from amusing amateur microscopists before TV was invented, they usefully browse and reduce green algae in aquaria or lake. The book lacks all the synonyms or pond species, e.g. live-bearing *Rotifer vulgaris* of pre-war literature presumably not included in plankton species. Nor do I find the commoner, egg-laying *Proales wernechii*. Mrs Pontin has, however, produced the usual high standard of this well-known series. Limited, of course, by space to those in the freshwater plankton, and thus not with everyone the pond-dipper admires, like tube-building *Melicerta*, trumpet-shaped Fluscules, etc., the key covers only those drawn in a fine-mesh plankton net rather than those found only on pondweeds and at the bottom. The smaller, simpler male rotifers are also described. The beginner should, however, first read a popular introduction to microscopic waterlife, or the overwhelming detail to be scrutinized in this section alone could be rather off-putting.

Eric Hardy.

The Three Rivers Fishkeeping Exhibition

THE THIRD ANNUAL Three Rivers Fishkeeping Exhibition, was held this year on the 7th, 8th and 9th July, in the sports complex of the Eldon Square shopping complex, in Newcastle upon Tyne. Sponsored by Aquarian fishfoods the planning and layout was expansive and very well attended.

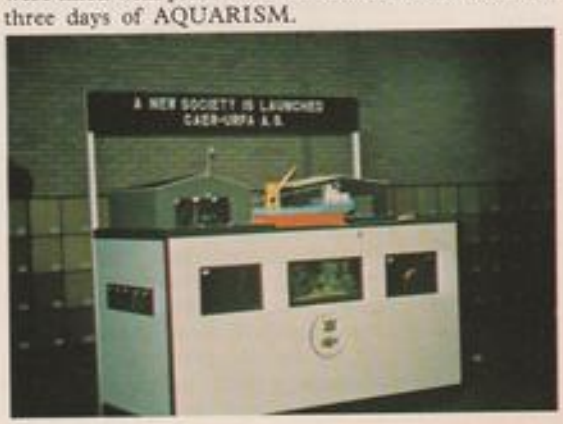
The premises was open to entries from Monday, 3rd July and many societies took full advantage of the early opportunity to erect and test their stands and tableauxs. A very interesting assortment of ideas on exhibiting themes was very soon apparent, for a very varied amount of piles of sections and fishkeeping paraphenalia began to appear all around the exhibition area. By the time Tuesday evening had expired the sections had taken form and tanks were being filled and electrics hooked into the system.

So the show took shape and the response from Tyne and Tees societies was very encouraging indeed, many members giving a lending hand to members of other societies who were arriving at a later period. Quite a few of the hardy types had given up a week's holiday to administer day and night, each working hard without complaining.

At last Friday arrived, our day of opening, and the judges began their allotted tasks, selecting the class winners and places from a selection of very high grade fish. The tableaux and stands were then judged in a most competant manner by the management of the Eldon Square shopping complex, who were in their own rights experts on presentation and layout. No one could argue with the results. First place in tableaux went to a large Hovercraft by Billingham Half Moon society; second went to South Shields moon base; third to a new society, Caer Urfa A.S., of South Shields with a launching scene, and fourth to Novos of Newcastle with a Hadrian's Wall theme. The best stand was won by Stanley A.S., a well known stand that has boasted many first places. The Caer Urfa tableaux carried the 'Best Fish in Show', won by Peter Wright with a superb *Crenopoma kingsleyi*, which has since become a father to a sizeable brood of young, and so he missed Belle Vue on materimonial grounds. Mr. R. Burns staged his great hunk o' cat in the Big, Bad or Ugly competition and walked it with his *Phractocephalus hemiliopterus*, which was very highly pointed.

There were many other notable achievements: Jack English of Throckley A.S. got 'best exhibitor' and Half Moon, Billingham the 'best society', but the most notable achievements went unseen to the novice's eye and they were the achievements of the managerial staff of the exhibition, especially of Mr. George Liddle, the Show Manager. The exhibition is staged each year by the Tyne Tees Area of the F.B.A.S., but is open to all societies who wish to enter and our show in 1979 will see entries from many societies from other areas of the nation. Will you be there to share our success?

Sunday was the heaviest attended day and the public kept up a steady flow until presentation time and then it was the time when all good things come to an end. Down came the stands, out went the fish and water and only the few who were there all the time were left to tidy up and wearily make their ways home to beds, some that had not been used for days. Yes, they were weary, but their hearts were filled with pride for their endeavours and a great three days of AQUARISM.



WHAT IS YOUR OPINION?

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

Photographs by the Author

BEST WISHES for the New Year: I hope it will bring peace, health happiness and prosperity to you and yours. At this time one tends to think of relatives and friends who live in other parts of the world—and this gives me an opportunity to introduce a reader who lives a long way from the U.K. She is Miss Loretta Kelley, whose letter reached me from the Department of Anatomy, School of Medicine, The Center for the Health Sciences, University of California, Los Angeles, California 90024, U.S.A. I envy Miss Kelley the warm weather associated with California—particularly today when we, in this part of the world, experienced our first black ice of the autumn/winter.

Miss Kelley makes the following remarks in her interesting letter:

"I have just received the September issue of your magazine. Since it travels by surface mail, I'm always a couple of months behind the times. Anyway, since in that issue you said you were just out of Java moss and that you were expecting a supply later, probably by now your supply has been replenished and you would be able to send me some. I am enclosing a plastic bag and two International Reply Coupons. I hope they are sufficient to purchase air mail postage. If not, I would appreciate you informing me as to exactly how much they are worth because I have done this sort of thing before and have absolutely no idea of the value of these coupons with respect to air mail postage.

"I would like to contribute to your column; you asked about experiences with peat moss as a plant-growing medium under the gravel. A friend of mine who is very successful with plants recommended the following: place ½ to 1 inch of common house plant peat moss on the bottom of the aquarium. Then obtain some common white clay used for ceramics, roll it out with a rolling pin into thin sheets about ¼ in thick, and cover the peat moss with the clay. As well as providing extra nourishment the clay prevents the peat moss from being scattered around. Finally, cover the clay with about 2 inches of sand. I set up my 29 gallon show aquarium in this manner, and planted it with *Cryptocoryne nevilli* and *affinis* in the foreground and with *Hygrophila*, water wisteria, *Rotala* and *Ambulia* in the background. I have had it set up for six months and have had one problem which might possibly be attributed to the peat moss since it occurs in none of my other tanks—blue-green alga. It started appearing about 3 months ago, and since then I have been picking it off the plants and rocks every 2 weeks and siphoning it out. Various books I have consulted have attributed it to an accumulation of organic matter, alkaline pH, and a host of other things, and most have recommended changing the lighting, pH or temperature and keeping the tank clean. I have been feeding my fish more sparingly than ever, I have several *Corydoras* to keep detritus from settling on the bottom, and also have been reducing the light; but this hasn't had any apparent effect. Lately I have tried increasing the light, and there may be some possible improvement. I sincerely hope so because I don't want to risk damaging my plants with an algacide, and it's extremely tedious going over all the leaves to remove the stuff. If any of your readers can shed light on this problem, I would like to hear about it.

"As to how my plants have been doing: the *Cryptocoryne affinis* are doing wonderfully, sending out runners everywhere and starting to form a carpet. The *nevilli* have put out many new leaves but only one runner, but I think they are naturally slower-growing. The *Ambulia* and *Hygrophila* have only been put in recently, and I don't know how they'll do in the long run. The water wisteria and *Rotala* are only fair, but I think they may have been damaged by the blue-green alga cutting off the light to the leaves.

"In Karel Rataj's book, *Aquarium Plants*, he recommends using an undergravel filter and no fertilizer except for the droppings from the fish; for best results the aquarium should be an old, well-established one. Mr Robert Gasser, a well-known grower of rare aquarium plants in Florida, is against undergravel filters, but he is also in favour of natural fertilization only, except in a few special cases. Because of their advice I have just taken one of my well-established tanks with no peat moss or undergravel filter, but rich in detritus, and set it up with Amazon swords, *Rotala* and water wisteria (again), pygmy chain swords and *Vallisneria*. I will be able to compare these two tanks as the water and light are about the same for each. By the way, the tap water in Los Angeles is about 25° DH and 8·5 pH, but I dilute it half-and-half with distilled water for the benefit of the plants. I use fluorescent lights, on for about 14 hours a day, supplemented with a few hours of indirect sunlight.

"I am deeply interested in growing good plants and read everything I can on the subject. I think that so far the best information I have found has been in Mr Robert Gasser's monthly articles published in *Freshwater and Marine Aquarium*, a new (since last January) U.S. publication. I heartily recommend them.

"I hope this letter has been of interest to you, and that you will be able to send me some of your Java moss."

I forwarded a sample of the requested plant to Miss Kelley together with some of my own findings on growing aquatic plants (her water is much harder and more alkaline than that in my area). I hope the plant will thrive for her as it has for the many other people who received samples earlier last year—and those who received them included readers in America and Central America. I have yet to discover the value of International Reply Coupons—if any—when applied to air mail postage. My local post office doesn't seem to stretch to such esoteric items and I have yet to find time to visit the main post office—despite having gathered quite a collection of such coupons from America. To date I have just paid American readers' air mail postage out of my own pocket.

Photograph 1 shows one of my *Cabomba* plants in the process of flowering. Notice the difference between the floating leaves and the ordinary leaves. I include the print for the benefit of Mr. D. Allford, of 69 Sheppard Road, Basingstoke, Hants. He sent me the following letter during what passed for last summer. "I read your column every month and over the years have noticed a great number of people who are unable to grow plants in their tropical aquariums. I find this most surprising as recently I set up a tank of tropicals and all my plants are flourishing. I have used no fertilizers; just a layer of coarse gravel. I have two 15 watt bulbs that are on for about fourteen hours daily—from eight in the morning until ten at night. The fish are a mixture of guppies and tetras and I use a box filter with carbon and filter wool. The only plants I've got are *Cabomba caroliniana*, *Elodea*, and a plant that greatly resembles *Ludwigia natans* but hasn't got purple under the leaves. I am not really sure why my plants do so well The water is very hard and I always thought that soft water was best. However, the tank does receive a certain amount of natural light because it is positioned near a window.

"I wonder if you or any of your readers could identify the plant I mentioned earlier. It grows well out of the water and if such pieces are broken off and placed in the gravel they root quite easily. Also, I wonder if anyone amongst your readers has had *Cabomba* flower because I wonder what the chances are of my getting my sturdy specimens to do so. I have read that the flowers resemble small waterlily flowers." (It's difficult to identify a plant without seeing a specimen but yours sound like a species of *Hygrophila*, Mr. Allport.)

Master Richard Howe was 14½ when he wrote the following letter from his home at 46 Norton Road, Daventry, Northampton. "I thought that you might like to know about my *Ancistrus multispinis*. I purchased them in late 1977. After about six months of hard studying I gave up trying to find out if I had

a male and a female, two males, or two females. I have a 48 in. all-glass aquarium, where they are housed. They are with other different fish as it is a community tank. The aquarium is not planted densely as I have many decorations and a large piece of petrified wood in it.

"The larger of the two fish began to go into a roughly shaped castle. It was in there day and night. This was very strange because they both used to be out and about all day and most of the night. I was out most of the day and time was very short. I had time only to siphon and feed my fish so breeding was out of the question.

"One morning when I went down to feed my fish the larger fish was out, and over the next few days it began to go back to its general routine. Now was my chance to see what was going on. I took a look in the castle and saw about a dozen young fish. After the fifth day the little fish were left to fend for themselves. As they were in a community tank I thought it would be best to move them. A friend who used to keep tropical fish gave me advice—which I took—and I spent a week going through a book and found out that the larger fish was the male. Has anyone else had this type of fish breed in a community tank. If so I should like to hear from him or her. I have been keeping fish for over three years and find them very interesting."

Mr. Terry Flood's letter is undated, hence the information it contains may be dated. Mr. Flood, who lives at 18 Booth Close, Thamesmead, London, S.E.28, wrote the following: "Some time ago you asked about public aquariums visited by readers. Recently I paid about £70·00 for a camera with which to photograph my fish and fish in various public aquariums—so far London Zoo Aquarium and Margate Aquarium. I consider these two to be very bad although I cannot say how bad because I have not been to any other public aquariums with which to compare them. The main faults at London were as follows: a good selection of coldwater and freshwater tropical fishes but the marine side, apart from turtles etc., consisted of a solitary tank with an anemone or two and some clown fish; the condition of almost every fish seemed to be very poor—especially the coldwater bream; and some of the tanks, e.g. the carp tank, seemed grossly overcrowded.

"If you happen to be passing Margate Public Aquarium it is certainly worth popping in; however, it is not worth travelling too far if you are really only interested in the aquarium. I travelled from London to Margate on the train for the sole purpose of photographing the fish. The main fault in my eyes was the size of most of the tanks—which were not much larger than normal household tanks. In fact most of the tanks were operated using ordinary heaters and U/G filters available from pet shops anywhere. The marine side was again poorly represented although there was a marked improvement over London Zoo Aquarium. Margate Aquarium had about four marine tanks. One contained sea-horses, pipefish and a few shrimps etc.; another housed a large anemone and a few small ones, various invertebrates, a tomato clown, an angel, one mandarin dragonette and another fish that was either a neon goby or a cleaner wrasse; the other sported some scats, a mono and a few other, to me, unknown fish. I cannot remember whether or not there was another marine tank. Without hesitation I will say that the fish in Margate Aquarium were all in the peak of condition—probably due to the understocked tanks. The water in each tank was crystal-clear.

"Again, if you are going that way pop in and look around; there are a few seats if you're feeling tired; but I wouldn't travel too far for the aquarium alone. I was fairly lucky in that the aquarium shop staff let me take some photographs in there—and there were fish in there that weren't in the public aquarium.

"I wonder if any readers know if there's a firm that markets a battery-operated pump that switches itself on if the electricity should fail. I now keep marine fish and am a little worried about any power-cuts lasting any length of time—which we are bound to have this winter because we get them every winter, don't we? Also, does anyone know of other easy-to-get-to-from-London public aquariums apart from the two I've mentioned? I will be going to Brighton Aquarium in the next few weeks and I hope I will be more satisfied with it than with the others.

"Isn't it about time we had a *British* marine aquarium magazine on the market? One marine aquarium magazine on sale in England is ridiculously priced, consists of very few pages and is printed in the U.S.A.; hence all the advertisements are for American products, most of which are unavailable in the U.K. Couldn't *The Aquarist* run a sister magazine? I should think coldwater enthusiasts would like the same kind of thing for their side of the hobby. And, finally, how about an *Aquarist Annual*? Why not have an opinion poll on my last few points to see how many people would buy each one?" (Well, those are Mr. Flood's opinions. Would you like to see other specialist aquarium magazines on the market? My opinion is that the U.K. isn't big enough or rich enough to provide enough readers to make such specialist magazines profitable propositions—even if we include readers who live overseas. After all, even though we tend to grumble about the prices of tanks, equipment, fishes, plants, foods etc. our hobby is a relatively inexpensive one that is within the means of children and lower-paid workers, as well as the rich. Indeed, I suspect that the majority of aquarists are not rich people. Once a tank is set up, a few pence per week will pay for fish foods; and one can still purchase many interesting fishes for pence rather than pounds. Other hobbies—such as photography or hi-fi—can support a much larger number of magazines but such hobbies are very much more expensive, e.g. a reasonably-good camera will

cost about £65·00 plus and a decent cassette deck will cost £100·00 plus. What is your opinion?)

No. 9 Wyndham Close, Birch Glen, Colchester, Essex, heads the following letter I received from Mr. R. G. Farrow. He wrote: "I read with great interest Ernest Boughton's article on half-beaks (*Dermogenys pusillus*) in the November, 1978 edition of *The Aquarist*. I was left with the impression that the author did not care for these fish very much and I should like, through your column, to try to redress the balance a little. I have kept half-beaks for some time now and have two adult males and one female. I never experienced any feeding problems as they all readily accepted flake foods, liver, hard-boiled egg yolk and cod roe. I also gave them live *Daphnia* and either *Tubifex* or grindal worms two or three times per week.

"Half-beaks are an unusual species and mine are a talking point when friends and fellow aquarists see them. They are a relatively-inexpensive way of filling the upper third of a tank and give some balance to a community tank. Under Gro-Lux lighting the males are splendid fish with their blue-tipped, orange fins. They are inoffensive to other tank inmates and once you have a pair you will never be short of a half-beak or two. Since I first purchased my fish about six months ago my one female has produced over fifty fry, most of which survived and are growing well.

"Mr. Boughton said he covered three-quarters of the water surface with *Riccia*. I found that my fish settled down with only a few floating plants. The fish in this situation showed no desire to hide although there was sufficient cover in which to do so. The fry are in a tank with no floating plants at all apart from a few blades of *Vallisneria* that have extended to and lie on the surface.

"I have found half-beaks a very interesting addition to a peaceful community tank and to those people who are looking for something a little out of the ordinary, and at the same time easy to breed, I can thoroughly recommend a few of these fish."

Master Paul Filby doesn't give his age but because I spend much of my time reading young people's writing I should say he's in the 11-13 age group. Paul, who lives at 126 Gainsborough Green, Abingdon, Oxon., has the following to say: "I would be grateful if you could put this somewhere in your magazine. I have to swop three medium-sized *Cichlasoma meeki* (firemouths) and one medium-sized *Belontia signata* (combtail). I would be especially interested in *Badis badis* or any *Corydoras* species. I think an exchange and wanted column would be a great idea and I'm sure it would work very well.

"I have been told that the *Jenysia* (?) species have not appeared in pet shops in England as yet; so if anyone has brought any over from another country when moving would he or she be kind enough to send me a line, please. Master James Petticrew wrote in about his *Cichlasoma cyanoguttatum* (Texas cichlid) and he appeared to be very lucky with his because mine attacked and killed one male Siamese fighter, removed the eye from a bronze *Corydoras* and ate two platies!

"I also kept a 2 in. green pufferfish. It ate *Tubifex* cubes, flake foods, *Daphnia*, one platy and two half-beaks. He once caught hold of one of my fingers with his teeth and didn't let got for about five seconds, even when taken out of the water. The most expensive fish that I own is an Arawana. It cost £8·50 and eats worms, beetles when available, and some live fish."

Post Office Stores, Tittleshall, Kings Lynn, Norfolk, is the address that appears on the next letter—written by Mr. Ken Smith. "I read with interest the remarks of Mr. M. Cooper and Mr. R. E. Browning (October, 1978 edition) on the subject of their experiences with the raising of gouramies' fry. I have also tried with

dwarf, giant and opaline without any great success. Inducing the adults to do their part is no problem; but when it comes to raising the resulting fry it's a different kettle of fish. I once managed to raise seventy-five; and on another occasion thirty-six; but my usual score is likely to be around a dozen. I have tried with large and small tanks, also with varying depths of water, lots of plants and just a few, plus varying temperatures, but still the results are disappointing.

"On reflection, however, I have had similar results with many of the other species—with the exception of kribensis where the results of my pair became an embarrassment as they always presented me with over a hundred every month. It seems to me that the fittest shall survive at the expense of the weak.

"At the moment I am trying to breed some pear gouramies; who knows, perhaps I shall have more success with these. It's funny how we still keep on trying, knowing the odds against us. If only we could train our fish to look after their own fry I am sure they would be able to make a better job of it." (I suppose we all tend to forget that in the wild a very tiny proportion of baby fish born to any given mother ever reaches maturity. If it were otherwise it would not be long before lakes, rivers, streams and seas were filled with rotting corpses.)

Photograph 2 is of a green sailfin molly. Please send me details of your experiences with the breeding of this beautiful species.

Mr. Alan G. Barnes resides at 4 Mountbatten Grove, Gedling, Notts., and his subject is aquarium shows. He says: "I was interested in your description of 'AQUA '78' (October, 1978 issue) held in Belfast. I thought you might like to hear about my visit to the 27th British Aquarists' Festival, held at Belle Vue on 21st-22nd October, 1978. I organized a trip with my club, Queen of the Midlands A.S. of Nottingham.

"There were fifteen of us on the trip and we arrived at Belle Vue at 11.00 a.m. on the Saturday morning. By 1.30 p.m. everyone had seen everything, eaten lunch in the restaurant and even had a few pints in one of the three bars. Although the quality of the tableaux was very high, in my opinion the quantity was somewhat lacking. In the large billing in *The A. & P.* the B.A.F .was called 'Europe's Biggest and Best Aquarists' Show'. There were about ten tableaux and only the same number of trade stands. On behalf of Queen of the Midlands A.S. I should like to say how disappointed we were to have travelled such a distance for such a poor turn-out. I'm sorry for the F.N.A.S. but the Yorkshire Aquarist Societies' Festival at Doncaster was far bigger and better. Better luck next year, though!"

Master Adam Locke's handwriting suggests that he is also in the 11-13 age group. His home is at Newtown Lodge, Minstead, Lyndhurst, Hants., and he has the following remarks to make: "The thing that provoked this letter was the reference to finrot in your column of August, 1978. Mr. T. Buckley's methods of curing finrot, although effective, is quite barbaric. I discovered a much more humane method about six months ago. I had a red-tailed black shark that I had had since I began fishkeeping and I was quite attached to it. I had trained it to feed from my fingers and it loved its tummy being tickled. Anyway, back to the point. My shark had a bad attack of finrot: its tail and most of its fins had disappeared. My father suggested I use acriflavine. This is a green chemical that can be obtained from any chemist without prescription. You use it in the proportion 0·01%. Your water will go a fluorescent green but the colour will disappear after about three days. This kills the bacteria or virus that cause or causes the rotting—and it doesn't affect plants. The fins grow back within two weeks."

I've been having more problems with diseased and/or dying fishes. Some weeks ago I bought some more fishes—from a different shop—and placed specific species in three different, inhabited tanks. The fishes in one tank have remained perfectly healthy; those in a second tank continued to look perfectly healthy but last week, on separate days, I lost three beautiful gouramies; each looked perfectly healthy one day and was dead—for no visible reason—on the following day. The four neons that I added to the third tank developed white spot the day after I purchased them. I raised the temperature in the tank and added a white spot cure. The spots began to disappear—but a couple of days later the four neons developed velvet disease! I visited a couple of local pet shops and finally unearthed a cure for velvet. I added the first of the prescribed doses of the cure to the tank. One neon died—but the other three quickly recovered so I did not add any further doses of the cure because they seemed unnecessary. None of the other fishes in the tank was affected either by the white spot or the velvet disease—nor did either of the cures affect the other fishes or the plants. A couple of feedings with white worms soon had the small neons looking plump and healthy. Incidentally, the velvet cure was a Petcraft product and I can recommend it. I should say it was a solution of acriflavine judging by its colour in the aquarium—a fluorescent green. I suspended filtration when using the treatment even though I do not use activated carbon in my outside filters. Incidentally, it's much safer to buy branded cures from an aquarium shop rather than to buy 'raw' chemicals from a chemist and risk the possibility of giving the incorrect dosage. Branded cures give specific instructions for dosages and most labels remind one to allow for water displaced by rocks, gravel etc. in a tank. One would think that I should have learned, after keeping fishes for well over a quarter of a century, to quarantine new stock before introducing them into inhabited tanks. Even after so many years I still don't have a spare tank in which to quarantine new fishes. I may yet learn!

Mr. D. A. Collishaw's home is at 89 Westgate,

Sleaford, Lincs., and he writes: "With regards to your query on the breeding of *Corydoras*, may I relate my success—albeit limited, but nevertheless, success—with my short-bodied catfish, *Brochis coeruleus*, which is in the same family of *Callichthuidae* as the *Corydoras* genus? My introduction to the hobby began with the gift of a tank full of fish and for a long time I hoped that the two catfish I had would be induced to breed; but it wasn't until the death of one of them that I realized that my pair were, in fact, two females. The sole remaining female was without a partner for some two to three months until a suitable replacement was found; but within two weeks of providing her with a mate I was rewarded by finding about 100 to 150 eggs stuck to the side of my community tank. Not knowing whether or not to take the eggs out I left them where they were—only to find them covered in fungus within three days. Fortunately I had another chance when my catfish obliged with some more eggs three or four weeks later. This time I removed the fertilized eggs, which were slightly darker, and floated them in a container to which a few drops of methylene blue had been added. From the twenty or so eggs removed from the tank I am now the proud owner of one young fish which is about one centimetre long. The water in the tank is quite alkaline and kept at 76°F. I hope to be more successful when I set up a separate breeding tank—but I am very pleased with my results to date.

"I have been successful with wisteria and Amazon sword plants but have failed miserably with *Vallisneria spiralis* and *torta* in the same tank. I use an external filter on my tank but am thinking of fitting the less demanding U/G filters when I set up some more tanks. How do I get a good growth of plants using U/G filters?" (A good depth of gravel might help—but there is no sure method. Were I you, I would stick to outside filters; but there are many aquarists who use U/G filters and grow good plants. Chance plays a large part in the growing of good plants unless one carefully adjusts the various facets of the aquatic environment that affect plant growth.) Mr. Collishaw ends his letter by saying: "If anyone in the Sleaford/Lincoln area would like a shoal of red delta guppies (male) would he or she please send a note to the above address and I shall be pleased to oblige." (*N.B.* Mr. Collishaw wrote his letter in August of last year so the offer of guppies may no longer apply. I receive so many letters for this feature that I cannot include them all; nor can I guarantee that I'll be able to include a given for-sale-or-exchange item in a particular issue of the magazine. Short, neatly-written letters usually have a better chance of appearing in print—as do typed letters. Please send me details of your sale-or-exchange items, together with your name, address and telephone number, printed clearly on a postcard rather than in the body of a letter. Please note the date on any communications sent to me for inclusion in this feature. Please *don't* send me queries that require a personal reply because I just do not have time to write replies—and I know how annoying it can be to send a query to a magazine or advertiser and not receive a reply. Queries should be sent to Messrs. Boarder & Hems and they should be accompanied by a s.a.e. for a reply. I'm always happy to include queries in this feature—as long as you're prepared to wait several months to see readers' replies in print.)

I am pleased to learn that my friend Dick Mills, editor of the Bulletin produced by the F.B.A.S., and a regular contributor to *W.Y.O.*, has just published his first book. *Aquaria*, by Dick Mills, has been produced in collaboration with the Federation of British Aquatic Societies and is published by E.P. Publishing Ltd., Bradford Road, East Ardsley, Wakefield, West Yorkshire. *Aquaria* is an interesting addition to the K.T.G. (Know The Game) series, best known for its plethora of titles dealing with sports and games—from Archery and Association Football to Wrestling and Yoga.

Dick's book retails at only 60p and contains a wealth of sensible and practical information from the pen of a keen, practising aquarist. It is well illustrated with a selection of photographs and drawings and covers just about everything the beginner needs to know—from a brief history of the hobby to the benefits of membership of a society. I doubt if you'll find a better introduction to the hobby for little more than the price of a packet of cigarettes.

For next month please send me your opinions on the following: (a) insulating tropical tanks; (b) cultivating white worms; (c) breeding white cloud mountain minnows; (d) feeding marines; (e) is it necessary to change part of the water in an aquarium at regular intervals? Once again, Happy New Year! Drop me a line—if you get time.

Wholesale and retail aquatic service in Nottinghamshire

EXTENSIVE new premises have recently been opened in Sutton in Ashfield, by Exotic Sealife & Tropical Aquariums. Maurice and Janet Williams, the proprietors, offer selection from 250 tanks of Marine Fish, Invertebrates, Tropical and Coldwater Fish, together with a wide variety of plants.

They also have a complete range of dry goods from all the leading manufacturers, offering good discounts which give traders the added advantage of being able to buy everything they require from one place. All their fish are sold with a twenty-four hour guarantee, and a van delivery service is available if required.

Further expansion is planned, as a large warehouse is being purchased to cope with the demands of customers. A large number of aquatic traders are already taking advantage of the Exotic Sealife service, and their aim is to achieve countrywide distribution.

News 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.

THERE were 650 entries for the **Doncaster & D. A.S.** Show. Best Fish in Show: A.O.V. Cat. owned by T. Stansfield (Ind.). Other results: Guppies: 1, Mr. and Mrs. Kirk (Sth. Humberside); 2, Mr. Harrison (Grimsby and Cleethorpes); 3, Mr. and Mrs. Kirk (Sth. Humberside). Platies: 1, Mr. and Mrs. Hill (Barnsley); 2, Mr. and Mrs. Jarman (Ind.); 3, S. Price (Castleford). Mollies: 1, J. and W. Jordan (Sth. Humberside); 2, Mr. and Mrs. England (Barnsley); 3, Mr. and Mrs. Riley (Leeds P.O.). Swordtails: 1, Mr. Bottomley (Doncaster); 2 and 3, Mr. Draper (Alferton). A.O.V. Livebearer: 1, T. Busfield (Barnsley); 2, Mrs. D. Cruickshank (Ealing); 3, Mr. and Mrs. Flint (Doncaster). Breeders Live: A and B: 1, Mr. Thorpe (Doncaster); 2, Mr. and Mrs. Hopkinson (Darfield); 3, G. Andrew (Hull). Breeders Live, C and D: 1, B. Banks (Thorne); 2, T. Busfield (Barnsley); 3, Mr. and Mrs. Hill (Barnsley). Breeders Egg A and B: 1 and 2, D. Barrett (Thorne); 3, Mr. Gover (Ind.). Breeders Egg C and D: 1, Mr. and Mrs. Copley (Doncaster); 2, B. Banks (Thorne); 3, Mr. Fisher (Sherwood). Dwarf Cichlids: 1, S. Price (Castleford); 2, Mrs. Gray (Wyke); 3, L. Price (Castleford). Angels: 1 and 2, Mr. and Mrs. Jarman (Ind.); 3, A. and P. Barker (York and Dist.). Large Cichlids: 1, Mr. Jackson (Sherwood); 2, Mr. and Mrs. Lambie (Louth); 3, B. Sleight (Mexboro). Rift Valley: 1, M. A. Hollingworth (Sherwood); 2, Mr. and Mrs. Sellars (Ind.); 3, I. Bellard (Hull). Small Barbs: 1, Mr. and Mrs. Hopkinson (Darfield); 2, Mr. and Mrs. Waller (Chesterfield); 3, M. Price (Castleford). Large Barbs: 1, B. Sleight (Mexboro); 2, Mr. and Mrs. Ellerker (Scarboro); 3, Master D. Hull (Doncaster). Goldfish and Comets: 1 and 2, E. & J. Morton (Hull); 3, K. Chapman (Mexboro). A.O.V. Coldwater: 1, K. and M. Wood (Bridlington); 2, Mr. and Mrs. Roberts (Doncaster); 3, Mr. and Mrs. Tindall (York and Dist.). Fancy Goldfish and Shubunkins: 1, M. and K. Woods (Bridlington); 2, K. Wilkinson (Halifax); 3, Mr. Derbyshire (Hull). Novice, Live: 1, E. Whalley (Barnsley); 2, Miss D. Lees (Doncaster); 3, J. Stroud (Skegness). Novice, Egg: 1, Mr. Simmonite (Doncaster); 2, S. Hancock (Retford); 3, Mr. and Mrs. Hodson (Immingham). Junior, Live: 1 and 2, Master P. Busfield (Barnsley); 3, Miss D. Hopkinson (Darfield). Junior, Egg: 1, Master Jackson (Sherwood); 2, Miss D. Hopkinson (Darfield); 3, Master J. Chadwick (Castleford). A.O.V. Tropical, Small: 1, Mr. and Mrs. Petty (Ind.); 2, Mr. A. Cook (Retford); 3, Mr. and Mrs. Riley (Leeds P.O.). A.O.V. Trop., Large: 1, Mr. and Mrs. Caldow (Scunthorpe Mus.); 2, Mr. and Mrs. Snowden (York and Dist.); 3, Mr. and Mrs. Kemp (Sheaf Valley). A.V. Marine: 1, Mr. Jackson (Sherwood); 2, Mr. and Mrs. Wright (Barnsley); 3, Mr. Brakes (Peterboro). Corydoras: 1 and 2, T. Cruickshank (Ealing); 3, Mr. and Mrs. Campbell (Ashby). A.O.V. Cats: 1, T. Stansfield (Ind.); 2, Mr. and Mrs. Honnor (Doncaster); 3, Mr. Fisher (Sherwood). Loaches: 1, Mr. and Mrs. Hooley (Bassetlaw); 2, S. Hancock (Retford); 3, Mr. and Mrs. Littler (Sheffield). Aphosehion: 1, B. Sleight (Mexboro); 2 and 3, B. Banks (Thorne). A.O.V. Toothcarps: 1, Mr. N. Carr (Doncaster); 2, B. Banks (Thorne) 3, B. Sleight (Mexboro). Ladies, Live: 1, Mrs. Hopkinson (Darfield); 2, Mrs. Ellerker (Scarboro); 3, Mrs. Sellars (Ind.). Ladies, Egg: 1, Mrs. G. Cook (Retford); 2, Mrs. Anderson (Wyke); 3, Mrs. Jackson (Sherwood). Fighters, True: 1, Mr. and Mrs. Riley (Leeds P.O.); 2, Mrs. Gray (Wyke); 3, T. Walker (Hull). Fighters, Multi: 1, Mrs. Anderson (Wyke); 2, Mr. and Mrs. Jarman (Ind.); 3, Mr. Draper (Alferton). Small Anabantids: 1, Mr. and Mrs. Lake (Sth. Humberside); 2, Mr. and Mrs. Slee (York and Dist.); 3, Mr. and Mrs. Riley (Leeds P.O.). Large Anabantids: 1, Mr. and Mrs. Clark (Nth. Staffs.); 2, K. Lancashire (Doncaster); 3, Mr. and Mrs. Copley (Doncaster). Pairs, Live: 1, B. Banks (Thorne); 2 and 3, T. Busfield (Barnsley). Pairs Egg: 1, L. Price (Castleford); 2, Mr. and Mrs. Kirk (Sth. Humberside); 3, M. Price (Castleford). Plants: 1, Mr. and Mrs. Roberts (Doncaster). Furnished Jars: 1 and 2, Mrs. Lee (Chesterfield). Small Characins: 1, Mr. and Mrs. Lake (Sth. Humberside); 2, Mr. and Mrs. Richardson (Scarboro); 3, Mr. and Mrs. Vernon (Idle). Large Characins: 1, Mr. and Mrs. Chadwick (Castleford); 2, Mr. and Mrs. Ellerker (Scarboro); 3, M. Price (Castleford). Sharks and Foxes: 1, H. Thorpe (Doncaster); 2, T. A. Cruickshank (Ealing); 3, Mr. Draper (Alferton). Rasbora: 1 and 2, A. Simpson (Barnsley); 3, N. Gow (Scunthorpe Mus.). Minnows: 1, Master Jackson (Sherwood); 2, K. and M. Wood (Bridlington); 3, Mr. and Mrs. Ellerker (Scarboro). Danios: 1, Mr. I. Duncan (Hull); 2, Mr. and Mrs. Richardson (Scarboro); 3, T. Walker (Hull).

* * *

THE SECOND **Irish Aquarists Festival** took place in the Star and Crescent Recreation Centre, Drogheda, and once again the Drogheda Tropical Fish Society and the Dublin Society of Aquarists combined to stage this event.

Results: Class A: 1, G. Smith; 2, E. Flanagan; 3, S. Carter; 4, G. Forrest. AG: 1, G. Smith; 2, P. Corrigan; 3, S. O'Toole; 4, A. Sallis. AF: 1, C. Smith; 2, S. Carter. BA: 1 and 2, M. Carlisle. BZ: 1, R. Hoare; 2, J. Lyttle; 3, G. Smith; 4, K. Martin. CA: 1, A. Bride; 2, D. Hughes; 3, R. Hoare; 4, D. Bryans. CZ: 1, R. Hoare; 2, D. Jamison; 3, D. Bryans; 4, T. Sherlock. DA: 1, G. Smith; 2 and 4, J. Fitzsimons; 3, U. Pollock. DB: 1 and 4, W. Bride; 2, D. Bryans; 3, P. Corrigan. DZ: 1, E. Flanagan; 2, T. Sherlock; 3, M. Meegan; 4, B. Easton. EA: 1 and 3, K. Norton; 2, G. Smith; 4, M. Heeney. EZ: 1, S. O'Toole; 2, J. Lyttle; 3, G. Smith; 4, G. Forrest. F: 1 and 3, T. Sherlock; 2, G. Smith; 4, P. Smith. G: 1, W. Bride; 2, A. Bride; 3, J. Mucreedy; 4, J. Mahony. H: 1, S. O'Toole; 2, K. Martin; 3, D. Hughes; 4, D. McLaughlin. J: 1, E. Flanagan; 2, A. Bride; 3, J. Lyttle; 4, J. Donohoe. CB: 1 and 3, N. Scully; 2, K. Martin; 4, J. Macreedy. DC: 1, 3 and 4, R. Callaghan; 2, G. Forrest. K: 1 and 3, R. Thompson; 2, R. Bogue; 4, P. Corrigan. L: 1, 2 and 4, D. Tate; 3, W. Bride. M: 1, G. Smith; 2, R. Hoare; 3 and 4, K. Martin. N: 1, R. Hoare; 2 and 4, N. Scully; 3, J. Floody. O: 1, A. Sallis; 2, R. Hoare; 3, P. Norton; 4, N. Byrne. P: 1 and 2, Fancy Guppies Assn.; 3, N. Scully; 4, E. McGoldrick. Q: 1, B. Easton; 2, D. Bryans; 3, U. Pollock; 4, M. O'Brien. R: 1, S. Tully; 2, E. Flanagan; 3, D. Jamison; 4, K. Norton. S: 1 and 3, E. McGoldrick; 2, P. Corrigan; 4, R. Hoare. U: 1, 2, 3 and 4, D. Tate. V: 1 and 2, C. Smith; 3 and 4, E. McGoldrick. W: 1, 2 and 3, D. Tate; 4, C. Smith. XBM: 1, N. Scully; 2, B. Easton; 3 and 4, D. Tate. XOT: 1, G. Smith; 2, J. Lyttle; 3, P. Smith; 4, P. Corrigan. ZA: 1 and 3, S. Cooke; 2, D. Bryans; 4, K. Martin. ZB: 1, J. Lyttle. T: 1, G. Smith; 4, R. Thompson. Best Fish in Show: G. Smith. Runner-up to Best Fish in Show: E. Flanagan. Best Furnished Aquarium: C. Smith. Best Egglayer: G. Smith. Best Livebearer: G. Smith. Best Competitor: G. Smith. Best Coldwater Fish: D. Tate. Best Breeders' Team: N. Scully. Best Miniature Aquarium: G. Smith. Best Barb: R. Hoare. Best Characin: R. Hoare. Best Cichlid: G. Smith. Best Labrynth: S. O'Tocle. Best Catfish: W. Bride. Best Plant: J. Lyttle. Best

Mr. Gordon Smith, accepting the "Best Fish in Show" award for his Discus from the Mayor of Drogheda at the recent Irish Aquarists Festival.

A.O.S. Egglayer: G. Smith. Best A.O.S. Livebearer: G. Smith. North Kent Aquarists Shield for Best Angel Fish: J. Fitzsimons.

* * *

THERE were 18 Societies showing a total of 487 entries at the First Open Show of the **Darwen A.S.** Results—Section A Guppies: 1, K. Corbett (Merseyside); 2 & 3, T. Carney (Bridgewater). Platies: 1, M. Allinson (Sandgrounders); 2, D. Garstang (Longridge); 3, A. Unsworth (St Helens). Swordtails: 1, M. & J. Bradshaw (Longridge); 2, Mr & Mrs Williamson (Leigh); 3, B. Frost (Blackpool & Fylde). Mollies: 1, Mr & Mrs Aspinal (Sandgrounders); 2, K. Ludlow (Independent); 3, Mr & Mrs Iddon (Sandgrounders). AOV Livebearers: 1, Mr & Mrs B. Walsh (Blackburn); 2, T. & J. Selby (Wythenshaw); 3, P. Kenyon (Sandgrounders). Section Winner: Mr & Mrs B. Walsh (Blackburn). Section B Anabantids (small): 1 & 3, A. Lyons (Longridge); 2, Mr & Mrs Underwood (Southport). Anabantids (large): 1, Mr & Mrs Iddon (Sandgrounders); 2, Mr & Mrs B. Walsh (Blackburn); 3, A. Lyons (Longridge). Section Winner: Mr & Mrs Iddon (Sandgrounders). Section C Fighters: 1, J. Haley (Darwen); 2, W. Chapman (Bridgewater); 3, D. Garstang (Longridge). Section Winner: J. Haley (Darwen). Section D Small Cichlids: 1, P. & H. Batchelor (Loyne); 2, J. Corbett (Merseyside); 3, B. W. Carter (St Helens). Large Cichlids: 1, B. Gudgeon (Darwen); 2, Mr & Mrs Underwood (Southport); 3, Mr & Mrs Aspinal (Sandgrounders). Angels: 1, K. Buckley (Bridgewater); 2, D. Garstang (Longridge); 3, S. Martin (Skelmersdale). Rift Valley: 1, G. Mosley (Blackpool); 2, B. Wilson (Skelmersdale); 3, Mr & Mrs Iddon (Sandgrounders). Section Winner: G. Mosley (Blackpool). Section E Small Barbs: 1, P. Batchelor (Loyne); 2 & 3, A. Hopwood (Blackburn). Large Barbs: 1, R. Hodge (Southport); 2, T. & J. Selby (Wythenshaw); 3, A. Norse (Darwen). Section Winner: P. Batchelor (Loyne). Section F Small Characins: 1, Mr & Mrs Underwood (Southport); 2, F. S. & A. Hopwood (Blackburn); 3, K. Buckley (Bridgewater). Large Characins: 1 & 2, Mr & Mrs B. Walsh (Blackburn); 3, Mr & Mrs Underwood (Southport). Section Winners: Mr & Mrs B. Walsh (Blackburn). Section G Toothcarps: F. S. & A. Hopwood (Blackburn); 2, M. Allinson (Sandgrounders); 3, K. Buckley (Bridgewater). Section Winner: F. S. & A. Hopwood (Blackburn). Section H Danios: 1, J. Doody (Darwen); 2, J. Haley (Darwen); 3, Mr & Mrs Aspinal (Sandgrounders). Rasboras: 1, T. & J. Selby (Wythenshaw); 2, Mr & Mrs Underwood (Southport); 3, T. Hinsley (Bridgewater). Minnows: 1 & 2, Mr & Mrs Baldwin (Sandgrounders); 3, P. Kenyon (Sandgrounders). Section I Corydoras: 1, J. Tinsley (Sandgrounders); 2, J. Corbett (Merseyside); 3, R. Hodge (Southport). AOV Cats: 1, Mr & Mrs Baldwin (Sandgrounders); 2, P. J. Harwood (Darwen); 3, H. Burgoyne (Bridgewater). Section Winner: J. Tinsley (Sandgrounders). Section J Loaches: 1, Mr & Mrs Underwood (Southport); 2, Mr & Mrs Baldwin (Sandgrounders); 3, R. Bell (Nelson). Section Winner: Mr & Mrs Underwood (Southport). Section K Sharks: 1, B. Frost (Blackpool & Fylde); 2, V. Baldwin (Nelson); 3, E. Haley (Darwen). Foxes: 1 & 2, R. Bell (Nelson); 3, A. Rimmer (Skelmersdale). Section Winner: R. Bell (Nelson). Section L Breeders Egglayers (11-20): 1, Mr & Mrs Iddon (Sandgrounders); 2, F. Summers (Skelmersdale); 3, R. Free (Bridgewater). Breeders Egglayers (1-10): 1, F. Summers (Skelmersdale); 2, A. Baldwin (Nelson); 3, K. Brand (Darwen). Breeders Livebearers: 1, I. McCarthney (Skelmersdale); 2, A. Unsworth (St Helens); 3, Mr & Mrs B. Walsh (Blackburn). Section Winner: Mr & Mrs Iddon (Sandgrounders). Section M Pairs—Egglayers: 1, C. & M. Wadman (Darwen); 2, Mr & Mrs B. Walsh (Blackburn); 3, Mr & Mrs Hughes (Accrington). Pairs—Livebearers: 1, D. Matthews (Longridge); 2, Mr & Mrs Aspinal (Sandgrounders); 3, J. Corbett (Merseyside). Section Winner: C. & M. Wadman (Darwen). Section N AOV Tropical: 1, Mr & Mrs Millership (Bridgewater); 2, B. Gudgeon (Darwen); 3, P. Yates (Blackburn). Section Winner: Mr & Mrs Millership (Bridgewater). Section O Juniors—Livebearers: 1, D. Garstang (Longridge); 2, K. Corbett (Merseyside); 3, P. & I. Iddon (Sandgrounders). Juniors—Egglayers: 1, J. Tinsley (Sandgrounders); 2, P. & I. Iddon (Sandgrounders); 3, G. Lawless (Leigh). Section Winner: J. Tinsley (Sandgrounders). Section P Single Tail Coldwater: 1 & 3, Mr Downie (Sandgrounders); 2, B. Frost (Blackpool & Fylde). Twintail Coldwater: 1, Mr & Mrs Harvey (Sandgrounders); 2 & 3, Mr & Mrs Aspinal (Sandgrounders). AOV Coldwater: C. Wallbank (Accrington). AOV Coldwater: 1, Mr & Mrs Aspinal (Sandgrounders); 2, C. Wallbank (Accrington); 3, D. Harvey (Sandgrounders). Section Winner: Mr & Mrs Harvey (Sandgrounders). Section Q A.V. Marines: 1, G. Douglas (Darwen). Section Winner (G. Douglas, Darwen). The Aquarist and Poolkeeper Gold Pin for Best Fish in Show went to Mr J. Tinsley (Sandgrounders) for his corydoras.

* * *

AT the October meeting of the **Breckland Aquarist Club** Mr David Lauchlin, of Waveney Fish Farm, spoke to the 50 members on Coldwater Fish and Aquascape. He also brought a slide show of some of the garden pools and coldwater fish he was discussing. Meetings of the Breckland Aquarist Club are held on the second Monday of every month at 8 p.m. at the Gemini Public House (Lounge), Sandy Lane, Dereham, Norfolk, and new members are always welcome. (Inquiries concerning the Club, please contact Mr Adrian Head, Tel: Gressenhall 648.)

* * *

THE annual interclub match between the Isle of Wight and **South Park Aquatic (Study) Society** took place on 12th November at Drake Hall, Wimbledon, a coach full of I.o.W. members arrived, and while judging took place members arrived, and while judging took place the visiting party visited Sea Aquarium. The result was that S.P.A.S.S. retained the cup. Best Fish in Show was a Blue Gill Bass. Results—Native and Foreign: 1, Blue Gill Bass (80 pts), M. Dudley (S.P.A.S.S.); 2, Crucian Carp (78), R. Tring (S.P.A.S.S.); 3, Green Tench (76), J. Pollard (S.P.A.S.S.); 4, Bitterling (74), S. Stevens (I.o.W.). Twintails: 1, Fantail (71 pts), L. Clapp (S.P.A.S.S.); 2, Ironhead (70), J. Pollard (S.P.A.S.S.); 3, Pearlscale (67), M. Dudley (S.P.A.S.S.); 4, Fantail (65), B. McHugh (I.o.W.). Singletails: 1 & 3, Goldfish (76 pts), B. McHugh (I.o.W.); 2 & 4, Goldfish (73), G. Herring (S.P.A.S.S.). The judges were Mr D. Hickman, F.B.A.S. and Mr P. Biernacki, G.S.G.B.

* * *

AS from December there will be two meetings of the **Thanet A.S.** on the 1st and 3rd Tuesdays. The meetings to be held at the Club Rooms, Thanet Aquarium, Palm Bay, Margate, Kent at 8 p.m. All new members welcome.

* * *

AS 1978 draws to a close, members of the **Koi East Anglia** section of the B.K.K.S. look back to the highlights of the year, among them being the visit by the London Section in which they visited several members' pools in the area, filming each in turn, and finished up with a buffet meal on the lawn of the Waveney Fish Farm. Considering that this was a wonderful day weather wise, this gave members of the host and guest sections a couple of hours to bask in the summer sun and have a good natter on Koi matters. Then there was the visit to the Northern Section, this meant climbing aboard a coach at 4 a.m. on a Sunday morning for the long trip to the Manchester area, where they were escorted by members of the Northern Section to pools in the Bury, Oldham and Manchester areas and saw a wonderful selection of top class Koi. They finished up at the pool of the National Chairman, Roland Seal, where they gazed in awe at his marvellous collection of Koi, before being regaled with a delicious meal that must have given Mrs Pauline Seal and her band of helpers many hours of hard work to prepare. The section's own highlight was their own Open Show, held at Waveney Fish Farm, Diss, Norfolk, despite the bad weather this was their most successful show yet, and they hope this annual event will go from strength to strength, as, with the number of Koi keepers increasing yearly, the need for a really good annual show in East Anglia, so far removed from the recognised centres of Koi keeping of Birmingham and the North East, becomes increasingly urgent. Next year they hope to have a trophy to cover all 13 show classes of Koi, this year's trophies were won by the following: Best Koi in Show, a fine Doitsu Taisho Sanke owned by Mr Burton, of the London section. This fish also won the Best Sanke Trophy. Best Koi owned by a member of Koi East Anglia, a Sanke owned by MacBrister; Best Ohgon, Mr Ray Talbot; Best Shusui, Mr K. Groom; Best Kohaku, Mr Williams; Best Doitsu, a Hariwake owned by Harry Brundish; London Cup for Best Hikari Mono, Mr Brundish (this cup was presented by the London Section in appreciation of their visit to the Club); Best Kawari Mono, a Shiro Utsuri owned by Mr Swain. The first prize in the raffle, a beautiful Hariwake presented by Mr David Laughlin, and valued at £75, was won by a visitor from Cheshire. Plans are now being made to make 1979 even more enjoyable and instructive, if possible, than this year. Anyone reading this wishing to learn more about their Koi keeping hobby should contact Mr David Laughlin, at Waveney Fish Farm, Diss, Mr C. Bruter at 91 Cromwell Rd, Norwich or K. Groom (Hon. Sec.) at 24 Hunter Rd, Norwich.

* * *

CHELTENHAM Tropical Fish Club were welcome visitors at **Evesham Fishkeepers' Society's** November meeting for a six-a-side contest. Evesham's chairman (B. R. Gell), was question master for the quiz. Cheltenham were good natured losers in both sections with results 54 to 61 (quiz) and 781½ to 892 (fish show). The first three individual placings for which cards were awarded as follows—Egg layers: 1, N. Wing (Eve.); 2, Mrs J. Hessel (Eve.); 3, S. Biddle (Eve.). Livebearers: 1, Mrs Hawkins (Chelt.); 2, Mrs J. Hessel (Eve.); 3, Mrs J. Hessel (Eve.). Mr N. Wing (Eve.) won trophy for Best in Show. A return match is to be arranged in the near future. The Society meets on the first Wednesday of every month at 8 p.m. at the Hampton Scout Hut, Pershore Road, Evesham, Worcs. Visitors and new members welcomed. Club Secretary Mr M. Pattison, 22 Dudley Road, Honeybourne, Evesham, Worcs.

* * *

AT the November meeting of the **Mid-Sussex A.S.** held at the Fox and Hounds, Haywards Heath, Mr N. Short (Chairman) opened with the monthly auction. Mr Short went on to thank members for their fund raising efforts but pointed out that more would have to be done in this field, if the club was to beat rising costs. Invitations were put out to members for their children to attend the Clubs Annual Childrens Party which will be held at the Ascension Hall, Haywards Heath, on 16th December. Mr Short then welcomed an old friend of the society, Mr R. Muggeridge of the Sussex River Authority, who over the past few years has been giving a series of interesting lectures on various aspects of the Water Industry. The subject of discussion this month was "Biologists in the Water Industry".

The monthly table show was judged by Mr T. Ramshaw of Brighton and Southern A.S., who awarded the cards as follows—Fish of the Year: 1 & 2, J. Smith; 3, E. & T. Tester; 4, P. Levine. Novices: 1 & 3, P. Levine; 2, G. Lamb; 4, J. Birch. Breeders Egglayers: 1 & 2, B. Perrin. Breeders Livebearers: 1, L. Pinney.

The next meeting will be the Home Leg of the Over the Downs Interclub against Brighton and Southern A.S. which was postponed earlier in the year. It will be held on Thursday 14th December at the Fox and Hounds, Haywards Heath. Further details may be obtained from the Secretary, Mr W. Slade (Hay. Heath 53747).

* * *

THE **Loughborough & District A.S.** held its Annual Furnished Aquaria Competition during the Loughborough Fair which ran for three days. It was held as usual in aid of the John Storer House Foundation. A raffle raised in excess of £150. The award winners were as follows—1, and Graham Brewin Shield, Mrs N. Richardson; 2, Mr G. Howe; 3, Mr I. Purdy; 4, Mr A. Young. The awards were presented by Dr David Ford of the Animal Studies Centre, Waltham on the Wolds.

AT the Annual General Meeting of the **East London Aquarists & Pondkeepers Association** the following officers where elected—President, Mr P. Campilin; Vice-Presidents, Mr A. Field, Mr Petto, Mr R. Dodkin, Mr Taylor; Chairman, Mr J. Boss; Vice-Chairman, Mr. K. Wrightson; Secretary, Mrs P. Harris; Treasurer, Mr A. Harris; Programme Sec., Mr J. London; Show Sec., Mr T. Waller; Show Organiser, Mr K. Palmer; Editor, Mr R. Campion; Equipment Officer, Mr K. Baker; Press Officer, Mr D. Flack; Social Sec., Mrs N. Boss; Librarian, Mr G. Lyne; Lay Members, Mrs D. Lyne, Mr S. Bray. The Annual Show will be held on the 13th October.

* * *

OFFICERS elected at the recent Annual General Meeting of the **Kingsclere and District A.S.F.B.A.S.** were as follows—Chairman, P. Birtwistle; Show Secretary, A. Step; Treasurer, M. Cook; Club Shop, M. Shore; Secretary, Mrs M. R. Birtwistle, 16 Normanton Road, Basingstoke, Hants. (Tel: Bas. 50581). Meetings held alternate Tuesdays at the Council Offices, Kingsclere, at 8 p.m. New members welcomed.

* * *

AT the A.G.M. of the **Middlesbrough A.S.** the following officers were elected—Chairman, Mr D. Roddam; Treasurer, R. Paxton, 15 Wheraside, Marton, Middlesbrough (Tel: 319493); Show Secretary, A. Stevens; Secretary, S. Cook, 19 Berner Street, Middlesbrough (Tel: 826938). Meeting every Wednesday, "Dormans Museum" at 7.30 p.m. New members welcomed.

* * *

THERE were 426 entries for the **Northallerton & District Aquarist Society** Open Show. Results—Best in Show: Synodontis Eupterus, Mr M. Lister (Independent); Barbs (large): 1, Mr & Mrs Orton (South Shields); 2, L. Gray (Billingham); 3, N. McQuade (Redcar). Barbs (small): 1, B. Frost (Stockton); 2, Master W. Smith (Redcar); 3, Mr & Mrs Johnson (Scarborough). Characins (small): 1, Mr I. Cure (Independent); 2, Mr D. Russel (Stanley); 3, Messrs R. & D. Lunn (Redcar). Characins (large): 1, L. Gray (Billingham); 2, Messrs R. & D. Lunn (Redcar); 3, Mr & Mrs Richardson (Scarborough). Cichlids (angels): 1, Mr & Mrs James (Northallerton); 2, Mr House (Scarborough); 3, Mr & Mrs Embleton (NOVO) Cichlids (small): 1, Mr W. Sowersby (Scarborough); 2, Mr & Mrs Hopkinson (South Shields); 3, M. Lister (Independent). Haplochromis Derivates: 1, Mr & Mrs Orton (South Shields); 2, C. A. Enright (South Shields); 3, H. Garthwaite (Hartlepool). Cichlids: 1, H. Garthwaite (Hartlepool); 2, Mr Redman (Hartlepool); 3, Mr & Mrs Summerscales (Northallerton). Labyrinth (Fighter's): 1, Mrs Anderson (Wyke); 2, Mr & Mrs Riley (Leeds); 3, Mr & Mrs Embleton (NOVO). Labyrinth (AOV): 1, Mr Leighton (Half Moon); 2, Mr D. Russel (Stanley); 3, Mr Geldart (Billingham). E.L.T.C.: 1, Mr Geldart (Billingham); 2, P. Wright (Caerurfa); 3, Mr P. Riley (Stockton). Tropical Catfish: 1, Mr M. Lister (Independent); 2, Mr & Mrs Hopkinson (South Shields); 3, Mr Bunn (Half Moon). Corydoras & Brochis: 1, Mr & Mrs K. Welch (York); 2, P. Fry (Caerurfa); 3, Mr & Mrs Embleton (NOVO). Rasbora: 1, L. Gray (Billingham); 2, Mr W. Sowersby (Scarborough); 3, Mr & Mrs Copley (Doncaster). Danio & W.C.M.M.: 1, R. O. Sullivan (Middlesbrough); 2, Mr & Mrs Richardson (Scarborough); 3, L. Gray (Billingham). Loach & Botias: 1, Mr & Mrs Daines (Doncaster); 2, Mr & Mrs Orton (South Shields); 3, Mr J. King (Redcar). Labeo & Foxes: 1 & 2, Mr L. Burnett (Northallerton); 3, Mrs Anderson (Wyke). AOS Tropical: 1, Mr & Mrs Summerscales (Northallerton); 2, B. Frost (Stockton); 3, S. D. Smith (Hartlepool). Pairs—Egglayer: 1, Mr & Mrs Richardson (Scarborough); 2, Mrs & Mr Embleton (NOVO); 3, Mr & Mrs Copley (Doncaster). Pairs—Livebearer: 1, R. & D. Lunn (Redcar); 2, Mr & Mrs Ralph (Half Moon); 3, Mr D. Russel (Stanley). Guppy—Male: 1, Miss J. E. Short (Scarborough); 2, Mr J. N. Short (Scarborough); 3, Mr & Mrs Riley (Leeds). Guppy—Female: 1 & 2, Mr Banks (Thorne); 3, Mr & Mrs Elliker (Scarborough). Xiphophorus Helleri: 1 & 2, Mr R. Gledhill (Redcar); 3, Mr & Mrs Ralph (Half Moon). Platy: 1 & 2, Mr & Mrs Daines (Doncaster); 3, P. Wright (Caerurfa). Molly: 1, Mr S. D. Smith (Hartlepool); 2, N. McQuade (Redcar); 3, P. Wright (Caerurfa). AOS Livebearer: 1, Mr & Mrs Copley (Doncaster); 2, Mr L. Hunt (Half Moon); 3, Mr Bunn (Half Moon). Singletail Goldfish: 1, Mr Hope (Independent); 2, Mr N. McQuade (Redcar). Twintail goldfish: 1, Mr & Mrs Summerscales (Northallerton); 2, Master W. Smith (Redcar). AOS Coldwater: 1, Mr & Mrs Riley (Leeds); 2, Mr & Mrs Summerscales (Northallerton); 3, Master W. Smith (Redcar). Breeders—Livebearers: 1 & 3, Mr B. Banks (Thorne); 2, Mr Dodd (Independent). Breeders—Egglayer: 1, Mr Geldart (Billingham); 2, Mr Riley (Stockton); 3, Mr & Mrs Richardson (Scarborough). Juniors: 1, Lynne Embleton (NOVO); 2, P. Metcalfe (Scarborough); 3, S. D. Smith (Hartlepool).

* * *

AT the November meeting of the **Northern Goldfish and Pondkeepers Society** Mr Leslie Baxter gave an extremely interesting talk on goldfish genetics. Mr Baxter also told a little of the experiments and research work which he hopes to complete in 1979. The members were then told of the progress made by the show committee for the 1979 show, which is to be held in Bolton at the Silverwell Street Sports Centre in August. After refreshments members discussed fish diseases and which methods prove to be the best to cure them.

The Secretary reported that he had had many inquiries from people wishing to know more about the society for the purpose of joining. Many fish keepers it is felt are unaware that their membership covers such a wide area. Members travel from Bradford, Halifax, Leeds, Liverpool, Southport, Preston, Bolton and the Manchester area to attend the meetings which are held on the second Sunday of every month at 2 p.m. at the Baptist Church Hall, Beaver Road, Didsbury, Manchester 20.

The Northern Goldfish Society was formed in 1959, and is the second largest goldfish society in the country, and are always happy to welcome new members. Anyone wishing to know more details should write to the Secretary, Mr David Lord, 40 Hospital Road, Bromley Cross, Bolton, Lancashire. The society also publish a quarterly Journal which is sent free of charge to all postal members.

* * *

THERE was a total of 484 entries from 29 Societies at the **Halifax Open Show.** Results—Best Fish in Show, Mr R. Scoltock, Toothcarp (79 points). Guppy A.V.: 1, J. E. Short (63), Scarborough; 2, N. & M. Rimmer (62), Sandgrounders; 3, Mr & Mrs Hewitt (60), Osram. Maculatus and Variatus (Platy): 1, P. Kenyon (71), Sandgrounders; 2, A. Hunsworth (68), St Helens; 3, B. W. Carter (66), St Helens. (Molly) Latipinna Veilifera Sphenops: 1, Mr & Mrs J. Riley (65), Leeds; 2, N. & M. Rimmer (64), Sandgrounders; 3, Mr & Mrs Iddon (63), Sandgrounders. Swordtail A.V.: 1, Mr & Mrs Stevenson (68), Osram; 2, D. Smith (67), Aireborough; 3, K. Wright (65), Sandgrounders. Alfaro Brachyrhaphis Carl Hubbsis: 1, L. Hattersley (72), Sheaf Valley; 2, D. Hanns (71), Nelson. Gambusia Girhrdinus Glaridicath: 1, D. Hanns (70), Nelson; 2, J. Corbett (69), Merseyside; 3, E. Jones (68), Leigh. Goodea Lermichthys Limnaeus: 1, J. & J. Selby (72), Wydenshaw; 2, P. S. & A. Hopwood (69), Blackburn; 3, Mr & Mrs Hopkinson (67), Darfield. Heterandria Ilyodon Jenynsia: 1, K. Corbett (71), Merseyside; 2, R. Boardman (68), Leigh; 3, N. & M. Rimmer (65), Sandgrounders. Phallichthys Phallocerus: 1, Mr & Mrs Hopkinson (73), Darfield. Poecilia Poeciliopsis: 1, Mr & Mrs Hopkinson (72), Darfield; 2, C. Wood (70), Halifax; 3, G. Lawless (69), Leigh. Characins (small up to 7.5 cms): 1, Mr & Mrs Richardson (75), Scarborough; 2, Mr & Mrs Underwood (73), Southport; 3, P. S. & A. Hopwood (72), Blackburn. Characins (large over 7.5 cms): 1, Mr & Mrs Underwood (72), Southport; 2, Mr & Mrs Underwood (71), Southport; 3, Mr & Mrs Underwood (70), Southport. Barbs (small up to 7.5 cms): 1, Mr & Mrs Hopkinson (73), Darfield; 2, Mr & Mrs Underwood (72), Southport; 3, R. Boardman (71), Leigh. Barbs (large over 7.5 cms): 1, Mr & Mrs Snowden (71), York; 2, R. Boardman (70), Leigh; 3, S. Stevenson (69), Keighley. Rasboras Danios (Minnows): Mr & Mrs Stevenson (73), Osram; 2, Mr & Mrs K. Welsh (72), York; 3, Mr & Mrs Underwood (71), Southport. Sharks and Flying Foxes: 1, Mr & Mrs Stevenson (72), Osram; 2, Mr & Mrs Underwood (71), Southport; 3, R. & L. Bell (70), Nelson. Fighters: 1, Mrs Jackson (74), Sherwood; 2, Mrs Anderson (71), Wyke; 3, W. Chapman (70), Bridgewater. Anabantids (small up to to 8 cms): 1, Mr & Mrs Baldwin (70), Sandgrounders; 2, Mr & Mrs Underwood (69), Southport; 3, Mrs Anderson (66), Wyke. Anabantids (large over 8 cms): 1, Mr & Mrs Iddon (75), Sandgrounders; 2, Mr & Mrs Baldwin (72), Sandgrounders; 3, Mr & Mrs Iddon (71), Sandgrounders. Corydoras: 1, J. Corbett (78), Merseyside; 2, B. W. Carter (74), St Helens; 3, A. Baldwin (73), Nelson. Catfish A.O.V.: 1, E. Jones (73), Leigh; 2, Mr & Mrs Baldwin (72), Sandgrounders; 3, Mr & Mrs Underwood (71), Southport. Loach and Botias: 1, Mr & Mrs Underwood (77), Southport; 2, Mr & Mrs Baldwin (72), Sandgrounders; 3, Mr & Mrs Dobson (71), Keighley. A.O.V. Cichlids (up to 10 cms): 1, M. A. Hollinsworth (69), Sherwood; 2, Mr Lyden (61), Keighley; 3, A. Hopwood (60), Blackburn. Large Cichlids (over 10 cms): Mr & Mrs Underwood (72), Southport; 2, Mr Jackson (68), Sherwood; 3, Mr & Mrs Underwood (66), Southport. Angels: 1, M. Clayton (53), Halifax; 2, Mr & Mrs Stevenson (52), Osram; 3, D. Statham (51), Sheaf Valley. Rift Valley Cichlids: M. A. Hollingworth (78), Sherwood; 2, Mr & Mrs Iddon (73), Sandgrounders; 3, G. Moseley (70), Blackpool. Toothcarps (bottom spawners) :1, Mr R. Scoltock (79), BKA and Osram; 2, R. Brown (73), Morley; 3, M. Allinson (69), Sandgrounders. Toothcarps (top spawners): Mr R. Scoltock (77), BKA and Osram; 2, F. S. & A. Hopwood (74), Blackburn; 3, E. Jones (71), Leigh. A.O.V. Tropical: 1, P. G. Yates (75), Blackburn; 2, J. Sykes (73), David Browns; 3, Mr & Mrs Riley (70), Leeds. Breeders (Egglayers 1-10): 1, R. Brook (70), Huddersfield 2, E. Jones (68), Leigh; 3, J. Shackleton (66), Halifax. Breeders (Egglayers 11-20): 1, Mr & Mrs Iddon (69), Sandgrounders. Breeders (Livebearers 1-10): 1, A. Hunsworth (57), St Helens; 2, E. Jones (56), Leigh; 3, Mr & Mrs Hopkinson (55), Darfield. Pairs (Egglayers): 1, Mr & Mrs Richardson (70), Scarborough; 2, B. W. Carter (63), St Helens; 3, B. W. Carter (62), St Helens. Pairs (Livebearers): 1, N. & M. Rimmer (67), Sandgrounders; 2, Mr & Mrs Aspinall (66), Sandgrounders; 3, J. Corbett (61), Merseyside. Common Goldfish: 1, Mr & Mrs Waller (64), Chesterfield; 2, Mr & Mrs Waller (63), Chesterfield; 3, Mr & Mrs Haigh (61), Blackpool. Shubunkins: 1, Mr Downey (63), Sandgrounders; 2, Mr Downey (62), Sandgrounders; 3, Mr & Mrs Swales (60), Halifax. Veiltails: 1, P. Johnson (57), Northern Goldfish; 2, Mr & Mrs Hewett (53), Osram. Fantails: 1, Mr & Mrs Hewitt (70), Osram; 2, Mr & Mrs K. Wilkinson (65), Halifax; 3, Mr & Mrs K. Wilkinson (64), Halifax. Lionheads: 1, P. Johnson (67), Northern Goldfish; 2, S. Stevenson (66), Keighley; 3, Mr & Mrs Harvey (65), Sandgrounders. Orandas: 1, Mr & Mrs K. Wilkinson (63), Halifax; 2, Mr & Mrs Hewitt (57), Osram; 3, Mr D. Shields (54), Halifax. A.O.V. of Fancy Goldfish: 1, Mr & Mrs Snowden (62), York; 2, D. Harvey (60), Sandgrounders; 3, Mr & Mrs Hewitt (58), Osram. A.O.V. Native Coldwater: 1, Mr & Mrs Stevenson (60), Osram; 2, L. Redman (58), Halifax; 3, Mr & Mrs Dixon (56), Blackpool. Furnished Jard (4 in by 4 in): 1, Mr & Mrs Stevenson (74), Osram; 2, Mr & Mrs Stevenson (72), Osram; 3, Mr & Mrs Stevenson (71), Osram. Aquarium Plants: 1, D. Shields (74), Halifax; 2, Mr & Mrs Swales (62), Halifax; 3, D. Shields (61), Halifax. A.V. Marine Fish: 1, P. Robinson (72), Keighley; 2, Mr Jackson (70), Sherwood. Junior Livebearers: 1, K. Corbett (77), Merseyside; 2, Miss T. Hopkinson (71), Darfield; 3, D. Selby (70), Wydenshaw. Junior Egglayers: 1, P. & T. Iddon (74), Sandgrounders; 2, L. Groves (71), Southport; 3, R. Jackson (70), Sherwood. Ladies A.O.V.: Mrs Baldwin (73), Sandgrounders; 2, Greenway Family (72), Bradford; 3, Mrs Jackson (71), Sherwood. A.O.V.

Novice: 1, L. Yates (69), Blackburn; 2, L. Yates (67), Blackburn; 3, Mr Mottershead (66), Bradford.

Mr G. W. Ramsay, Sales and Marketing Manager of Thomas Halifax, presented the awards.

* * *

THE **Swindon A.S.** held two very successful meetings in October. The first was an open meeting when the main item of the evening was a talk illustrated with 130 slides by one of their own members Mr C. E. Curtis. The subjects were "Fish I have kept" and "Fish Photography". He concluded with a few slides of his marine tank, which proved very interesting. The second meeting was an F.B.A.S. slide-cassette on "Corydoras". This also proved very interesting. The Society holds it meetings on the 2nd and 4th Wednesday each month at 8 p.m. at the Mechanics Institute, Emlyn Square, Swindon. Anyone interested in fish-keeping is welcome to attend. The Secretary is Mrs Q. Curtis, 80 Beech Ave, Swindon, Wilts. Tel: 32920. She will be pleased to supply details of membership of the Society on request.

* * *

AT the recent A.G.M. of the **Tyne-Tees** Area Association of the F.B.A.S. there were a few changes of officers. The T.T.A.A. Council now consists of the following: Chairman, Mr K. Low; Vice-chairman, Mr C. Liddle; Secretary, Mr C. A. Enright, 27 Longacre, Houghton-le-Spring, Tyne Wear; Treasurer, Mr D. Horsfield; Council members, Mr F. Askew (Trophy Sec.), Mr A. Embleton, Mr J. English, Mr R. Gledhill, Mr J. King, Mr B. H. Risbridger (P.R.O.).

* * *

AT the Annual General Meeting of **Darwen A.S.** the following Committee was chosen: President, Mr B. Farran; Chairman, Mr K. Brand, 33 Anyon Street, Darwen (Tel: 74546); Secretary, Mr D. Gow, 95 Greenway Street, Darwen; Treasurer, Mr J. Farnhill, 43 Hollins Grove Street, Darwen; Show Secretary, Mrs S. Brand, 33 Anyon Street, Darwen (Tel: 74546).

* * *

RESULTS of the Fourth Inter-Society Show at the **Midland Aquarist League** at Newbold Village Hall, Rugby, held on October 29th. Hosts: Rugby Fishkeepers. A.O.V. Tropical—1, Mr & Mrs Salisbury (Nuneaton A.S.); 2, J. Booth (Loughborough & D.A.S.); 3, D. M. Hoskins (Leamington & D.A.S.); 4, Mr & Mrs Nesbit (Nuneaton A.S.). A.V. Characin (B)—1, D. Callow (Best-in-Show) (Coventry Pool & A.S.); 2, S.M.I.N. (Nuneaton A.S.); 3, Mr & Mrs Nesbit (Nuneaton A.S.); 4, R. Cleaver (Coventry Pool & A.S.). A.V. Killiefish—1, Mr & Mrs Cox (Nuneaton A.S.); 2-3, J. Lamb (Nuneaton A.S.) 4, F. Hurst (Coventry Pool & A.S.). Single Tailed Goldfish—1, D. M. Hoskins (Leamington & D.A.S.); 2, I. Purdy (Loughborough & D.A.S.); 3, Mrs N. Richardson (Loughborough & D.A.S.); 4, R. Cleaver (Coventry Pool & A.S.). 1st Award Winners—1 & 4, Mr & Mrs Salisbury (Trophy) (Nuneaton A.S.); 2, D. Callow (Coventry Pool & A.S.); 3, D. M. Hoskins (Leamington & D.A.S.).

Positions and final placings for 1978—1, Nuneaton A.S. (1st Show) 19, (2nd Show) 36, (3rd Show) 26, (4th Show) 40, (Total 121) (Trophy); 2, Leamington & D.A.S. 27, 21, 25, 24, 97 (Trophy); 3, Coventry Pool & A.S. 18, 22, 22, 27, 89; 4, Unit "59" 30, 24, 18, 16, 88; 5, Loughborough & D.A.S. 27, 16, 21, 17, 81; 6, Rugby Fishkeepers 8, 17, 14, 12, 51.

Individual placings—Mr & Mrs Underwood (Unit 59) 24 (Trophy); Mr & Mrs Salisbury (Nuneaton) 19; J. Booth (Loughborough) 18; S.M.I.N. (Nuneaton) 13; Mr & Mrs Nesbit (Nuneaton) 11; Mr & Mrs Chamberlain (Leamington) 10; D. M. Hoskins (Leamington) 8; D. Callow (Coventry) 8; R. Cleaver (Coventry) 6; Mr & Mrs Cox (Nuneaton) 6; O. L. Brine (Nuneaton) 5; A. & B. Lane (Rugby) 5; T. Viner (Leamington) 5; J. Lamb (Nuneaton) 5; F. Hurst (Coventry) 5; T.S.F.N. (Coventry) 4; B. Chittenden (Leamington) 4; G. Howe (Loughborough) 3; B. Fyfe (Leamington) 3; A. Maxfield (Leamington) 3; I. Purdy (Loughborough) 3; Robin Rice (Coventry) 2; Mrs N. Richardson (Loughborough) 2; Mr Stwynham (Rugby) 1; Mr & Mrs Rule (Rugby) 1; M. Burridge (Leamington) 1.

THE **Grangemouth A.S.**, who meet in the Youth and Community Centre on the second and last Thursday each month, held their second A.G.M. on 30th November. Although "remote" in the fish keeping world, President J. Makin felt it had been a successful year, thanks to the lecturers available locally and talks by the society's own members, plus a varied programme of tape and slide shows. Dr. D. M. Ford, of Aquarian Foods, is speaking on 12th April, when anyone interested is invited to contact Secretary, Mrs. J. Wardlaw, 15 Portal Road, Grangemouth, Stirlingshire (tel: Grangemouth 6047), as larger premises will be required for that evening. The Shield for the highest points gained in the Table Show was won by George Aitkenhead, while the Junior award went to Peter Bridges. J. Makin took the Furnished Aquaria Trophy, while Ian McLauchlin was the junior winner.

* * *

THE **Stockton-on-Tees A.S.** held their club meeting on 27th November for the Champion of Champions Trophy. Results: 1, Mr. Thackery (Cardinal Tetra); 2, Mr. L. Collins (Merry Widow); 3, Mr. and Mrs. Knibbs (Corydoras reticulatus); 4, Mr. and and Mrs. Wilson (Coolie Loach). Also the Insurance Trophy for any fish that has NOT won a card in the last six months: 1, Mr. L. Collins (Ruby Shark); 2, Mr. and Mrs. Knibbs (Flying Fox); 3, Mr. and Mrs. Knibbs (Blackline Rasbora); 4, Mr. and Mrs. Knibbs (Red Sword).

The Points Shield was presented for the highest points over the last six months (including points for 1st, 2nd, 3rd, 4th and 1 point for every fish benched, and for every fish winning a card 1st, 2nd, 3rd or 4th at any open show): 1, Mr. and Mrs. Knibb (125 pts.); 2, Mr. and Mrs. Wilson (72); 3, Mr. P. Riley (54); 4, Mr. Thackery (43). All fish judge by Mr. C. Buck, 'A' Class, F.B.A.S.

* * *

LEW EMERY, speaking to **Bristol A.S.**, emphasised the need for space to ensure the rapid growth of fish. Answering a question on pond construction, he offered the opinion that Snowcem, applied before drying out, could act as a sealant. He urged all pond constructors to test their efforts out with inexpensive fish before committing valuable stock.

* * *

AT THE November meeting of the **Goldfish Society of Great Britain**, Mr. J. Amos, who is both a member of the G.S.G.B. and M.A.P.S., talked on his many years of experience in keeping and breeding Bristol Shubunkins. He told members of his early days of fish keeping and how through careful selection he had produced the prize winning strain of Bristol Shubunkins that he has today. Jim's talk was supplemented by some 150 coloured slides showing his fish house, fish and the way he constructed the many ponds he has built in his garden.

During the break for tea, the last of the table shows for the 1978/79 Morris Cluse Breeders' Trophy was judged by Mr. J. Bundell and Mr. G. King. Class winners are as follows: Veiltails, Mr. B. Cook; Lionheads and Pom pons, Mr. J. Parker; Oranda, Mr. A. Lawman; Moors, Mr. G. Kendrew; Pearl Scales, Mr. A. Lesurf; London Shubunkins, Mrs. P. Wiettington; Bristol Shubunkins, Mr. B. Cook.

* * *

VENUE CHANGE

Ellesmere Port Aquarium Keepers Society will in future meet fortnightly at 7.30 p.m. on Wenesdays, at the Grosvenor Hotel, Dock Street, Ellesmere Port, Cheshire.

* * *

SECRETARY CHANGES

Federation of Scottish Aquarist Societies: Mrs. Jenn Bennett, 15 Coulter Avenue, Wishaw, Lanarkshire ML2 8SZ. (Tel: Wishaw 72264).

Tower Aquarist Society: J. Carter, 82 Woodedge Avenue, Huddersfield MD5 9UX, W. Yorks. (Tel: Hudd 33886).

* * *

NEW SOCIETY

A new society has been formed under the name of the **David Brown Pisces Club**, Leigh. They are a tropical and coldwater society and meet at the Leigh Harriers Club in Leigh.

Throckley A.S. meets at The Grange, Throckley, Newcastle. Officers: Chairman, Mr J. English; Vice-Chairman, Mr A. Flowers; Treasurer, Mr T. N. Gray; Secretary, Mrs M. Gray.

At the annual general meeting, members of the **Marlow and District A.S.** voted to change the name of the club to **Wycombe Marsh A.S.** The secretary is Mike Fox, 24 Kelvin Close, High Wycombe, Bucks. (Tel: HW 38823).

* * *

A new area group of the **British Killifish Association** has been formed in N. Ireland, to be called the Northern Ireland Area Killie Group (B.K.A.). Anyone wishing to further their interest in and knowledge of killifish will be welcome, but it will be expected that anyone joining the area group will also join the B.K.A. Those interested should contact Desi Bryans, BKA 490, 35 Knocknagoney Drive, Belfast, 4, N. Ireland.

* * *

GREETINGS

WE WERE delighted to receive a Christmas card from Mrs. Peggy Hammond, now living in New South Wales, Australia. She says that the *Aquarist* keeps her in touch and brings happy memories of the years she helped with the B.A.F.

* * *

CALENDAR

8th January: Marlow and District A.S. Dick Mills.

20th January: David Brown A.S. auction of fish, plants, equipment, etc., at Paddock Village Hall, Paddock, Huddersfield, at 2 p.m. Details from M. Morrison, 18 Lower Oldfield, Honley, Huddersfield. (Tel: Huddersfield 663401).

30th January: Barnsley Tropical Fish Society Open Mini-Show and Auction at Hoyle Mill W.M.C., Elm Row, Hoyle Mill, Barnsley. Further details from T. Bunfield, 31 Coniston Road, Barnsley (Tel: Barnsley 45436). The Annual Open Show will be held on 16th September at Ardsley Oaks Youth Centre, Doncaster Road, Ardsley, Barnsley.

6th February: Peterborough Fishkeepers' Association will meet at 7.30 p.m. at the 'Royal Oak', Lincoln Road, Walton, Peterborough for an illustrated talk on 'Keeping Koi and Pond Construction' given by Eric and Hilda Allen. Visitors welcome.

11th February: Sheaf Valley A.S. 6th Open Show at the Dormer Twist Drill Ltd., Cemetry Road, Sheffield, Yorks. Benching 12 noon to 2 p.m. Details from Mrs D. Golland, 70 Glenview Road, Greenhill, Sheffield, S8 7SG.

19th February: Marlow and District A.S.: Ron Fordee on plants.

4th March: Keighley A.S. Open Show at the Victoria Hall, Keighley. Please write for schedules from Mrs B. Pickles, 11 Lawcliffe Crescent, Lees Lane, Haworth, BD22 8RD.

31st March: Croydon A.S. open show. Schedules from Mr. Trevor Skeet, 64 Sumner Road, West Croydon (tel: 01-661 7861) or Mr. Les Derrick, 5 Glenthorne Avenue, Croydon (tel: 01-654 0984).

1st April: Reading and District A.S. Open Show at St Peter's School, Church Road, Earley, Nr. Reading. Ample car parking; 5 mins from M4. Schedules from P. C. Rushbrooke, 34 Melrose Gardens, Arborfield Cross, Berks. (Tel: A/C 760303).

8th April: Halifax A.S. open show. Details ater.

8th April: Malvern & District A.S. open show at St. Joseph's Hall, Newton Road, Malvern. Schedules from J. V. Walton, 1 Beaver Close, Lower Wick, Worcester WR2 4EG (tel: 422002).

15th April: Hyde A.S. annual open show.

15th April: Stockton-on-Tees A.S. 14th open show at Kiora Community Centre, Roseworth Estate, Stockton. Schedules from Mr. D. Knibbs, 15 Gray Street, Norton, Stockton, Cleveland.

16th April: Marlow and District A.S. Dr. Ford of Aquarian.