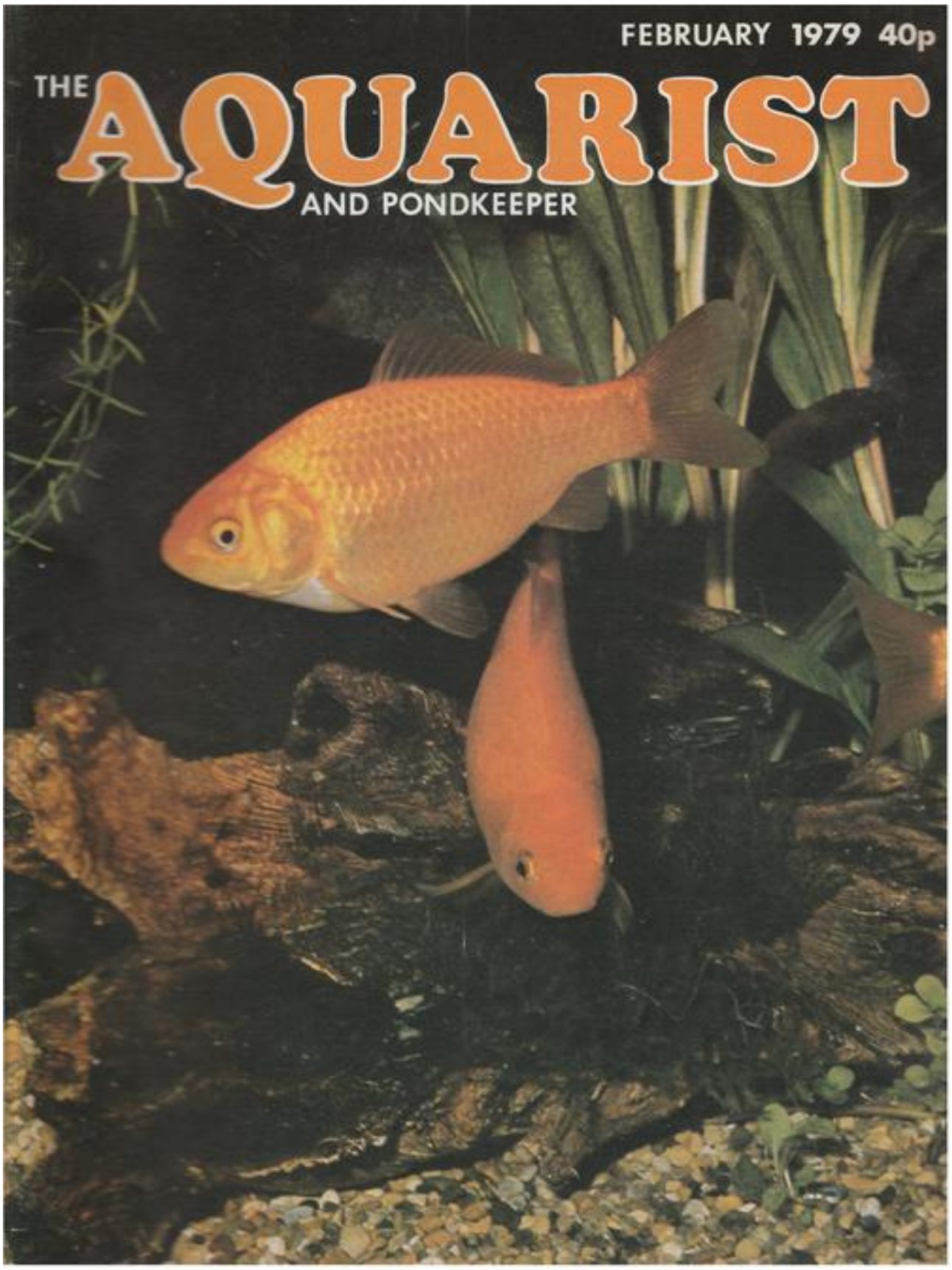
FEBRUARY 1979 40p

THE AQUARIST AND PONDKEEPER



THE AQUARIST AND PONDKEEPER

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Contents

Our Cover:
Common Goldfish

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EDITORIAL COMMENT

In this rapidly changing world there is little that is spared in the mounting disarray of a myriad facets of life which were once considered as stable norms. While some changes are motivated just for the sake of change, others are consequent upon a change of interlocking events and communication, in all its forms, is one of these.

The written word, which for so long formed the broad base of mass dissemination of news and information, has been partially surmounted, first by sound radio and then by television and 'potted' tapes. The need for printed matter still plays an important role, however, and not least in the field of the arts and sciences; so while news may be more easily conveyed by sound and vision radio waves, we still need our magazines to satisfy the readership of participants in leisure pursuits for both sporting and hobbyist adherents.

To assess the number of readers reached by any specific publication is an almost impossible endeavour and never more difficult than when both individuals and groups are concerned as in the case when associations and societies involved in the magazine's activity coverage are served.

When broadcasting information it is always useful to know how many are on the receiving end of the enterprise whether they form the number comprising an audience at a lecture in the village hall, family circles clustered around television sets or individuals perusing the pages of a newspaper or magazine.

Members of an audience attending a lecture can be counted and the television companies have an esoteric system of assessing their audiences, the mechanics of which have as yet eluded the writer.

With magazines the outmoded yardstick has ever been "circulation", a nebulous criteria which devolves upon the number of copies printed and circulated among the newsagents and bookstalls. More to the point is the readership which constitutes the number of individuals who open the magazine and assimilate its contents.

Aquarists, renowned for their thrift, include many keen members of our many national aquarium societies where a single copy of the *Aquarist and Pondkeeper* may pass from hand to hand achieving, en route to its dog-eared demise, a readership of some dozens contributing to a sum total of readers far in excess of the original circulation figures.

READER'S LETTER

Mystery Snails

I have recently started to keep tropical fish again after an enforced lapse of ten years. Not, let me hasten to add, as a guest of H.M.P.

You can well imagine the changes I have noticed in the last decade, surprisingly most breeds of fish are not as expensive as I thought they would have been.

The thing that struck me most was the price and the quantity of live foods! What a joke! A tiny plastic bag of coloured water containing dead, dying and, if one is lucky, a few live ones. A recent purchase of bloodworms worked out at 1p per worm; rather an expensive diet I think.

But back to the reason for my writing to you. As I have said I used to keep fish before and in my tanks also kept some large snails, I think they were called mystery snails; they were quite large about one inch in diameter. I have tried without success to obtain some of these; they did an excellent job in removing algae and were of great interest to observe. I would be grateful if you could advise me of a source of supply. At the same time could you please tell me if you know of anywhere I could purchase a worm-shredder; they were used to shred earth worms for fish feeding.

I thank you in anticipation and look forward to your reply.

Yours sincerely,
ROY HAYTHORNTHWAITE,
283 Southfield Street,
Nelson

Can any reader help Mr. Haythornthwaite in his quest? (Ed.)

ADVANCE NOTICE

EARLIER THIS YEAR!

28th

BRITISH AQUARISTS FESTIVAL

at

BELLE VUE ZOOLOGICAL GARDENS, MANCHESTER.

on

SEPTEMBER 1st and 2nd 1979.

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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

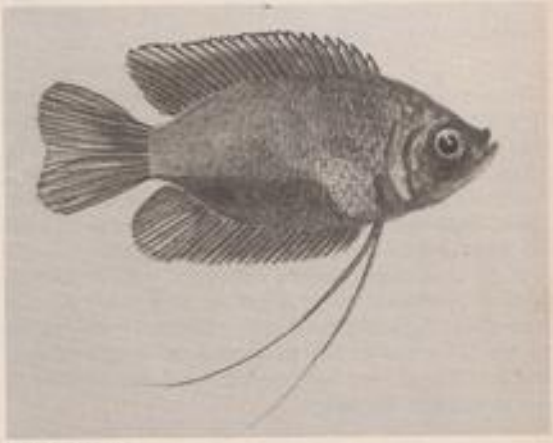
by Jack Hems

Can you tell me how best to keep a catfish called *Acanthodoras spinossimus*?

Give this fish thickets of strong-rooting plants to hide in or some flat stones (non-calcareous) to burrow under or lie against. *A. spinossimus* is not, if ever, noticeably active during the daytime. It does, however, move over the bottom in clumsy shuffles in search of food at night. It flourishes well on tiny pieces of raw red meat, small or chopped earthworms, whiteworms, baby woodlice and small freshwater shrimps. The temperature of the aquarium should be kept in the middle to upper seventies (°F) and any other fishes sharing the tank will not be molested if they are of a size too large to swallow.

Tell me, please, whether the introduction of two *Ctenobrycon spilurus* **into my community tank will result in any outbreaks of fin-tearing and similar damage in the not-so-distant future?**

Small (young) *C. spilurus* get on well with fishes of about 1½ to 2 in. Troublesome times may arise when the silver tetras increase in size; for this species is not long in attaining a length about 3 in. and, at this body length (and quite tall from back to belly), its sudden bursts of great activity usually send smaller fishes rushing for shelter. Furthermore, large *C. spilurus* do indulge in some chasing and rapid nipping of sluggish or timid fishes. It is best, then, to place *C. spilurus* in the company of fishes too large to be chased around or frightened. Among fishes well-suited to sharing a tank with *C. spilurus* are the giant danio, the elegant rasbora, the keyhole cichild, the clown barb, the spanner barb, and the like. *C. spilurus* lives for upwards of five years and in its larger sizes is apt to bite the tips off plants or tear at lacey foliage. In a thickly planted tank this sort of damage usually escapes notice. *C. spilurus* has a range of temperature from about the upper sixties to the middle eighties (°F).



Colisa chuna

I should appreciate some information on the furnishing of a tank, best temperature and food for the honey gourami?

The honey gourami or *Colisa chuna* is a species that flourishes well in a thickly planted tank maintained at a temperature of about 75°F (24°C). It will not starve if given such things as gnat larvae, Grindal or ordinary whiteworms, minute shreds of raw red meat and powdered flake food. It this species is placed in a tank with other fishes, make certain that its companions are very mild-mannered.

I am a novice fishkeeper and would like all the information you can give me regarding the proper care and breeding procedure of the angel fish (*Pterophyllum*).

I am sorry to say that I cannot help you much in the space of a letter or a few hundred words in this magazine, so I suggest that you send 60p. to this

office for a copy of *Angel Fish* (*the King of the aquarium*) by Dr. F. Ghadially. Dr. Ghadially bred thousands of angel fish annually before he left this country to take up an important appointment abroad. His well-illustrated and well-written booklet gives all the information you will require about keeping and breeding the several varieties of the scalare.

Pseudocrenilabrus multicolor

Please tell me how many weeks I must wait before a female Egyptian mouthbrooder (*Pseudocrenilabrus multicolor*) **will release fry which, I feel certain, she is carrying in her mouth. I observed her picking up eggs from a stone about a week ago and now she will not accept food and her mouth has become much enlarged.**

About a fortnight elapses before the well-developed fry are released. Bear in mind that any passing shadow or sudden vibration in the water will cause the fry to return to the protection of their mother's mouth. There they will remain until they feel it is safe to venture out again.

Can you tell me if I will have any trouble in my community tank now that I have added four small red-bellied piranhas to it? Up to now they are not bothering the other fishes which average about 6 in. long.

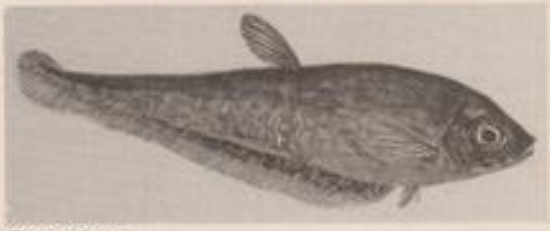
Baby piranha fish are often well-behaved but as they increase in size their bloodthirsty and aggressive traits surface and then you will be sorry you ever introduced them into a mixed species' tank. True piranha, that is the strictly flesh-eating species, should be given a tank to themselves. In a large tank a few may leave one another alone, but in a restricted space quarrels are almost certain to break out and it is very worrying to see fish with tails a bloody mess—and even worse damage. A richly coloured red-bellied piranha is best kept and always looks most attractive on its own.

Could I keep and breed *Heterandria formosa* **in a 16 in. × 8 in. × 8 in. tank?**

Very easily indeed provided the tank is well-furnished with plants to afford shelter for the small and rather infrequent batches of minute fry. Good growths of *Vesicularia dubyana* or *Eleocharis acicularis* reaching to the top of the water are recommended. The fry will find safe hiding places from cannibalistic parent fish there. A temperature in the lower to middle seventies (°F) is suitable for breeding. Adult fish will suffer no harm if the temperature sinks to the sixties (°F) very gradually and for not very prolonged periods.

Please tell me something about *Labeo weeksi*?

L. weeksi is from the middle and upper Congo. It reaches 8 in. or more in the aquarium (always more in the natural state) and does require plenty of swimming space. It is omnivorous in the truest sense of the word and does well on a mixed diet of dried food, flesh and living creatures (of swallowable size). It also browses on certain types of algae. With increasing size it becomes very territorially-minded and a great bully. Therefore it is best kept with its own kind or with other fishes too well-built and too assertive themselves to be intimidated by its threatening attitudes and buffeting around.

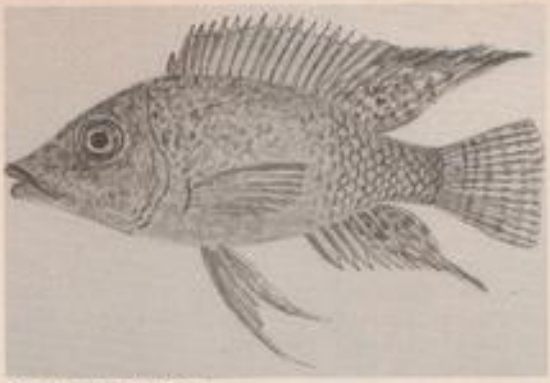


Colisa chuna

I should appreciate some advice on the temperature requirements and general care of *Notopterus chitala*. **And one more question, please? Where does this fish live in the wild?**

N. chitala is found in the natural state in Thailand, Burma and the Malay Archipelago. In its native waters it is said to attain a length of about 2 ft. It has the ability of swimming backwards or forwards with equal ease. It is light-shy and spends a lot of its time near to dense growths of water plants or hidden in the water plants themselves. A temperature in the middle to upper seventies (°F) is the most suitable for this species. *N. chitala* is active in a dim light or after dark. Recommended foods are small or chopped earthworms, whiteworms, tiny pieces of raw red meat or white fish such as cod, fresh haddock or whiting. Small specimens are all right in a largish community tank but large specimens are decidedly predacious and must not be trusted with fishes much smaller than themselves.

Can you recommend a few species of smaller cichlids (up to about 5 in.) that will live at peace with one another in a planted and rock-strewn



Geophagus acuticeps

aquarium 48 in. × 15 in. × 12 in. maintained at a temperature of about 72°F (22°C) to 75°F (24°C)?

Choose any of the foregoing species for your tank but remember that all cichlids, when thinking about and raising young, become very territorial-minded and drive intruders away from the spawning site. *Geophagus jurupari, G. balzani, G. acuticeps, Cichlasoma festivum, Cichlasoma meeki, Aequidens maronii, Nannacara anomala.* Your tank should support about seven or eight fish without overcrowding and allowing for normal growth.

I have just installed a 3 ft. tropical fish tank in my sitting room and wonder whether you would be good enough to let me know the names of some fishes which will live amicably with one another and give plenty of colour into the bargain?

You can hardly go wrong if you stock your tank with a mixture of the following fishes: black neon tetra, ordinary neon tetra, platinum tetra, harlequin fish, Schubert's barb, the albino *Corydoras aeneus* catfish, red or yellow platies, and a well-shaped and well-coloured red-finned shark. Do not introduce more than about 24 fishes into your tank. Introduce at least four each of the tetras and harlequin fish because they will move about in groups of their own kind.

I have consulted all my tropical fish books and magazines and cannot find any information about a fish called the apollo shark. Please can you help me?

The apollo shark is a popular name bestowed for some reason not apparent to this writer on species of cyprinid of the genus *Luciosoma*. These fishes appear to be distributed over Thailand and what was once rather loosely known as Indo-China and thence across to Borneo. Species of *Luciosoma* swim in the upper levels of the water and are elongated in shape, with well-developed lobes to the caudal fin and rather spikey-looking ventral fins. Lovely satiny sheens of lavender, pink, pearl and the rest are reflected from the sides. There are barbels on the mouth. All species known to the aquarist attain a fair length. That is to say about 10 in. or thereabouts. They make spectacular occupants for a community tank provided the other fishes present are not too small to be looked upon as live food. For in the wild state apollo sharks cruise near or at the surface and whip up small fry, insects falling onto the water, and aquatic larvae ascending to the surface. In the aquarium they should be given unwanted livebearer fry, gnat larvae, stunned flies, whiteworms dispensed from a perforated worm-feeder just touching the water, flake food, tiny moths and so on and so on.

How can I reduce the pH value of my aquarium without adding citric or tartaric acid as I have been advised by a fellow aquarium keeper? At the present time my aquarium water is slightly alkaline but not unreasonably hard.

Procure an internal box-type filter and fill it almost to the slatted top with previously soaked best quality moss peat (not a blended peat or a peat with any additives). Cover the peat with well-washed lime-free chippings to keep it in place (peat, unless really waterlogged, is very buoyant). Then connect the filter to an air-line and sink it to the bottom of the aquarium. After the pump has been switched on the passage of water through the peat will very gradually acidify the water. A sudden change of a pH value can be detrimental to the health of fish. Change the peat every so often until a test shows that the water is about 6.5 to 6.8.

Some weeks' ago I bought two 6 in. oscars that turned out to be a true pair. They spawned on a stone but as they behaved badly towards each other I separated them and the eggs soon turned white and grew a fluffy fungus. I cleaned up the stone and placed the fish together again. They are spending most of the time battering away at each other and locking jaws. What should I do to prevent serious injury?

I'm afraid the courtship of the oscar is more often than not a rough and tumble affair, but it is best to let the couple involved get on with it (if they are near enough the same size) and then, after eggs have been laid, sit back and watch developments. Maybe they will quieten down after they have eggs to watch over. If one parent refuses to co-operate in raising a family and persists in attacking his or her partner, then the best thing to do is to separate the fish. If one parent appears to be keen on looking after eggs and young, leave it to do the best it can. Most, if not all, cichlids are temperamental fishes and it is best to observe the behaviour of individual pairs and pander to their idiosyncracies.

COLDWATER QUERIES by Arthur Boarder

I bought two Comet goldfish and soon after I had them some greyish/white patches appeared on the ends of their tails. I treated them with salt and there was an improvement but it does not seem to have resulted in a permanent recovery. The fish are having no trouble in eating and other fins are held erect. What do you suggest as a cure?

As the disease is confined to the tail only it can be dabbed with neat T.C.P. once a day or, better still, make a very strong solution, say half to half of water and swish the tail in it once a day for a week or until cured. The solution need not reach the rest of the fish.

I have some good scaled fantails which are a good red but a few white patches have appeared on them. Do these white markings count against a fish in a show and will they disappear?

I doubt very much if the white markings will disappear. I have found that it is more likely that they will increase in size as the years go by, rather than fade out. Some judges will down point a fish with such markings but nowadays there are so many differing colours found in fancy goldfish that it is unlikely that the judge would take much notice. However, if you are intending to breed more fantails, I suggest that you do not use any fish with white markings if it can be avoided. I had the same trouble in early years of breeding red-scaled fantails and found that the fault can be bred out in time by never using white marked fish as breeders.

I bought some fantail goldfish and have three left. They have turned out to be all males in breeding condition. If there is no female present in the tank and they do not eject the milt, will it do them any harm and should I add a female fish now?

It will not harm the fish if they do not lose the milt. It will remain dormant in the fish until next season. I do not advise adding a female so late in the season as if it was not ready to spawn it could be distressed by the active males. It will be better to wait until the spring and even then three males to one female in a tank is rather asking for trouble. It may be all right in a pond with plenty of water plants for shelter, but in a tank it could be dangerous as regards the safety of the female.

Can you suggest any water plants for a cold-water tank which are not likely to be pulled up by my goldfish?

I have found that *Vallisneria spiralis* an excellent plant for the coldwater tank. I obtained a small supply in 1946 and have plenty of it still in very good condition. It has never been disturbed by fishes and is easy to keep under control. It increases by runners which can be removed if they are not wanted. I have never had to shorten any of the leaves and the plants from the original stock are as healthy as they ever were. You could also try *Ceratophyllum demersum*, and if you set it in a plastic net bag with a stone as an anchor, the fish will not be able to eat the main shoots and fresh new ones will be sent out repeatedly.

I have a concrete pond in the garden which appears to have sprung a leak as I have to keep topping it up. Is there anything I can throw into the water which would seal up any leaks?

I do not think that there is anything which would answer your purpose. You had better empty the pond and see if you can find any actual cracks. If there are none apparent, the whole surface may have become porous. This can happen when either the wrong kind of sand (such as very soft) has been used or the cement may not have been fresh enough or added in sufficient strength. If cracks are found they should be scraped out to remove any loose material and the crack dealt with by forcing in a mixture of three parts sharp sand to one part of fresh cement. Do not cause an over-lap. If no cracks are found, then a pond liner can be inserted and this will prevent any further leakage. An alternative plan is to paint the whole surface with Pond-seal, a rubberised type of paint which forms a waterproof coating.

I have a tank with assorted goldfish but cannot get my plants to look healthy. They get covered with brown Algae. I only have a light on for five hours a day.

The main trouble is that there is not enough light for the water plants. If they grow stronger they will choke out the Algae. Also you state that you have an under-gravel filter. This may be taking much of the nourishment which the plants could benefit from. Increase the light time and stop the filter for a while and see if it brings any improvement.

I have a goldfish which cannot keep on an even keel and a Vet., said that it was swim-bladder trouble and to massage the sides of the fish. It has not helped and I wonder what else I can do?

You may do more harm than good by massaging the fish as you could remove some of the mucus protective covering and the fish would then be prone to attacks

by disease or pests. The best cure is to keep the fish in shallow warm water and it should improve.

In the summer I noticed a number of spider-like creatures skating about on top of the water in my garden pond. What are they and will they harm the fishes ?

The creatures you describe are known as Pond Skaters or Water Spiders, a genus of ten species, the commonest one being *Gerris najas*. They are about an inch long with legs which give them the appearance of being much larger. They are able to skate about on the film on the surface of the pond. They will do no harm to the fishes as they feed on insects etc., which fall on the water or have newly hatched from gnat or mosquito larvae. The eggs are covered by a jelly and are attached to water plants near or on the surface.

I would like to try my hand at breeding fancy goldfish and would like your opinion on whether it is better to breed them in a pond or in tanks?

I prefer the pond method of breeding fancy goldfish with the addition of a number of hatching and rearing tanks. However, for those varieties of goldfish with large flowing fins, it is better to breed them in large tanks. The best type of pond is one with a shallow part where the fish can be encouraged to spawn. Goldfish, and many other kinds of fish, will always spawn in shallow water if it contains surface floating water plants for the reception of the eggs. It is easy to collect eggs when they are laid if bunches of fine-leaved water plants are anchored there.

The breeding stock should be well fed from the beginning of March especially on garden worms if possible. The water should be in good condition and well oxygenated. It is advisable to see that there are not too many water plants in the pond, especially those which grow near the surface. This is so that the fish will not spawn on them and so make the collection of eggs almost impossible. At about the beginning of April the bunches of water plants should be put in the shallow end. These should be attended to every few days and washed up and down to remove any loose detritus which could prevent the eggs from adhering to them. Spare tanks should be ready to receive the plants with eggs soon after they are laid. If eggs are left in the pond too long, they may be eaten by the parent fish.

The hatching tanks can be heated to about 70°F, to bring about a quick hatch, which will be three and a half days as a rule. Aeration will help to provide plenty of oxygen to help the eggs and newly hatched fry.

Just recently my goldfish spawned and I removed the eggs to a separate tank. The fry hatched after a few days but after about a week they started to die off. I started with 40 fry and now have only four. Can you say why they died?

I think that the reason for the death of so many fry was that the water was impure. You did not state the size of tank in which you have the fry. They may have been overcrowded but I do not think that this was the case with such small fry. I have found that when small, fry can stand being crowded much better than when they are older. They need such a small amount of oxygen that they do not seem to mind lack of space. It is when they are nearly an inch long over-all, that they must have more swimming space. Either the water in the hatching tank was foul or you made it so by over-feeding with something which was uneaten and so polluted the water. It is so easy to upset the water as one may see the fry eating well and give that little extra which can foul the water in just a day if uneaten. Also dried food may have been given before the fry were ready for it. The time for this feeding depends on the warmth of the water. If it is at 70°F., the fry can grow twice as quickly as when it is 60°F., if fed correctly, and the water is well oxygenated.

Read up the directions for breeding fish in a good book and you may find where you went wrong and so avoid making the same mistake again.

Is there any hard and fast rule as to the times varieties of goldfish should be fed, please?

There can be no hard and fast rule for feeding as there are so many conditions concerning this matter. You will find that the best method is to offer the very smallest amount of food at first and if this is not taken within a minute, no more must be given that day. There are many factors which govern the appetites of fishes that this method is the only safe one in most cases. The temperature of the water can have an important effect on the amount of food which a goldfish can eat and digest. In warm water, providing that it is well oxygenated and pure, the fish can be fed twice a day as they are able to digest their food more quickly and so be ready for more sooner than if the water was colder. In an indoor tank the fish can be fed once a day throughout the year but once the water cools down in winter the amount offered must be reduced.

In a garden pond the feeding is rather different as there is almost sure to be a certain amount of food available for the fishes in the shape of water creatures and soft vegetation. It is not always the calendar which decides the feeding problem in ponds and the temperature of the water can have a large effect on the appetites of the fishes. Once the pond water cools down below 50°F., it will be noticed that the fishes eat less and when it approached 40°F., no food should be given at all. During mild spells in the winter a little food can be offered but only by sticking to the rule I have stated above.

KOI QUERIES

by Hilda Allen

Although I only have a few Koi, I have been interested in cold-water fish for about fifteen years. Today I was told by my local pet-shop owner that the only difference between Koi and goldfish is the colour and scales. I do not think this is correct but can you please explain how they differ?

Koi are variations of and descended from the wild carp *Cyprinus carpio*, both goldfish and Koi belong to the same family, *Cyprinidae*. Coloured Carp (Koi) usually grow much larger than goldfish and can have different types of scaling as in Mirror carp which have large scales or Leather carp which have no scales. These Koi are known as Doitsu, meaning German, as these types are considered to be of German origin. A red and white Koi is known as Kolaku, a Doitsu Kolaku is a red and white Koi with either large scales or is scaleless.

The one very obvious difference between Koi and goldfish is that Koi have two pairs of 'barbels' which appear at each side of the mouth, rather like a small moustache; all carp have these. Anyone who has seen Koi and compared them to goldfish should find it very easy to distinguish between the two.

I have just made a Koi pond in the form of a 14 feet by 12 feet oval. The pond was made with a liner and, by leaving a 12 inch-high earth ridge under the liner, I have allowed a suitable area for and under-gravel filter. Will you please forward details of the type and cost of a pump which should be used for my size of pond.

I am using your query so that readers may learn of your good idea in providing a ready-made container for an under-gravel filter. This demonstrates again that it is much easier to incorporate facilities during the making of a Koi-pond rather than trying to add them afterwards. I have sent you details of a suitable pump for your purpose, I think it is fair to say that, whatever the output claimed for a pump, about 30% may be lost due to friction in the pipe-work and gravel.

At the time of writing the weather has suddenly turned extremely cold and the Koi are sitting on the bottom of the pond. I have not fed them for a few days but can you explain when it would be advisable to resume feeding? As this is my first winter with Koi I do not know if they can go without food for days, weeks or months and I would be grateful for some guidance.

This question is not a new one but inevitably there are always new readers and new Koi-keepers, perhaps I may be allowed to try and explain what I do not find very easy to explain in a brief space. There is no real substitute for experience, but observation coupled with common sense will lead you to success once you understand more about Koi. Being carp, they are fairly hardy providing they are not stressed by being kept in shallow water which becomes colder much quicker than deep volumes of water. Rapid fluctuations in temperature are bad for Koi. When frosts are forecast no food should be offered, this could lead to trouble with falling temperatures; most Koi go down and rest in the deepest areas at the onset of icy weather. If this should last for more than a day or two some of the Koi will move and swim about, even under ice. This activity is usually confined to larger specimens or those that have been kept here through previous winters. During November and December it is unusual for frost to last for more than a few days and on a rising temperature Koi will begin to roam the pond actively searching for food. Then a small quantity of food (such as earthworms) should be offered and it should be noted whether these are eaten in a short space of time or left. These are the signs to decide if and when to feed Koi. Floating food must be avoided, Koi will follow their natural instincts and keep to where the water may be slightly less cold, at the bottom of the pond. Uneaten pellets etc. will only sink to pollute the water.

During January and February longer spells of severe cold weather can be expected and during these months Koi may go into a state of semi-hibernation when they should be left as undisturbed as possible. Koi that have been fed well during the summer and autumn will have laid up reserves to see them safely through several weeks without food. Feeding them a little when weather conditions warrant it helps to guarantee that they will face the Spring in good condition. No one can forecast the severity of the coming winter but Koi that have been well fed, for as long as possible, and protected in deep water from sudden changes in temperature stand a better chance of survival. Filters should be kept in operation and water changed at reduced intervals to keep conditions clean and wholesome. The pleasure our Koi give us in summer surely demands that we do not ignore them when, like us, they would certainly prefer to be warmer.

On a lighter note, as good gardeners are said to have 'green fingers', do good fishkeepers have fish-fingers? Like gardening, fishkeeping is a year-round occupation.

VICTORIA, QUEEN OF THE AMAZON

by Philip Swindells

In 1801 the distinguished botanist, Haenke, came across an enormous waterlily growing in a sluggish backwater of the river Amazon deep in the heart of Bolivia. Its huge circular floating leaves were in excess of ten feet across and provided a landing and nesting place for the local species of Spurwing. Haenke was fascinated by the plant, and after making a thorough botanical study, returned home with details of his find. It was not, however, until 1838, after several years of discussion and argument amongst eminent botanists, that this giant aquatic was finally named *Victoria amazonica*, in honour of the reigning monarch.

Two years later the first seed was collected and sent to the Royal Botanical Gardens, Kew, but despite every care and attention the seed failed to germinate. Subsequent attempts failed, until in 1849 Mr. Paxton of Chatsworth managed to raise a plant. This eventually flowered in the November of that year, whereupon the exuberant gentleman presented both a leaf and a flower to the delighted Queen Victoria.

Everything about this plant is quite remarkable and unlike anything else in the vegetable kingdom. The enormous, pale green circular leaves have large upturned margins and are covered on their undersides with masses of stout protective spines. The exquisite floating blooms, which are produced throughout the summer and autumn, are nocturnal and very short-lived, lasting for only two nights. Each flower is a very complex structure some twelve inches in diameter and consisting of over one hundred and fifty petals. When the young buds break the emerging young petals are pure white, but turn to an agreeable shade of pale pink by early the first morning. The following night the pale pink flower opens and emits a delicious aroma reminiscent of fresh pineapple, which increases in its intensity as the night wears on until finally the ageing flower, which by this time is a deep plum colour, disintegrates. Pollination takes place after the first night, when myriads of frustrated water beetles, trapped by the rapidly closing petals, try to make an escape, casting clouds of viable pollen asunder. The results of their unintentional efforts are evident about a week after the flower has withered, when clusters of young rounded fruits begin to form. These ripen under the water and contain the black pea-like seeds which the South American natives collect, roast and consume with great relish.

Two geographical forms are recognised, one referred to as *V. amazonica*, the original plant type collected by Haenke, and the other which is often said to be a distinct species is known as *V. cruziana* (*syn. V. trickeri*). The latter was collected in Argentina by D'Orbigny and named in honour of General Santa Cruz of Bolivia. It is said to flower early and tolerate colder conditions than the type. A form collected from the Matto Grosso many years ago was named *V. cruziana var. mattagrossensis* (*V. randi*), but has not been in cultivation since before the turn of the century. It was said to have reddish leaves with prominent red veins and flowers that changed colour much quicker than either *V. amazonica* or *V. cruziana*.

Cultivation of these giants is comparatively simple when ample space and heat is available. The seeds, which are about the size of garden peas, usually ripen during November and December. They are stored in water or saturated green sphagnum moss in a test tube until required for sowing during early March. They are then sown individually in small pots in a compost equivalent to John Innes No. 1, but devoid of the base fertiliser as this tends to foul and cloud the water. A mixture of dried blood and bone meal usually proves to be a suitable substitute. A thin layer of clean silver sand is then spread over the surface of the compost and the pots are submerged in water maintained at 75°F in an aquarium or similar receptacle. After about three weeks the seeds germinate and push up two or three

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A young lady is easily supported by a sturdy *Victoria amazonica* leaf.

small hastate leaves which lie just under the surface of the water. The fourth or fifth leaf usually proves to be the first floating leaf and is six or eight inches in diameter. At this stage the plant should be repotted in an eight or ten inch pot and stood in the pool with about eighteen inches of water. During the next month round juvenile floating leaves will be produced regularly at the rate of two or three a week, gradually, increasing in size until reaching some two feet across when the characteristic upturned edge will become evident. This is the true adult floating leaf, and its production usually indicates that the plant is ready for repotting. As it is a gross feeder, the new compost should be considerably enriched with extremely well rotted animal manure and the plant potted in a container of ample dimensions and replaced in the pool with the water level raised a further six or nine inches. After a few days the searching roots penetrate the rotted animal manure and a great surge of growth takes place. New leaves are produced; rapidly increasing in size until they are upwards of six feet across with an upturned edge six inches to nine inches high.

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 werneckii*. 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.

Reptiles and Amphibians in Crete

by H. G. B. Gilpin

I SPENT the first fortnight of last October in Crete, based at a villa a few miles outside Nicolaos. The garden in front of the house led down to a road overlooking the sea and was filled with hibiscus, geraniums and bourganvillia. Insects, including Humming Bird Moths, huge blue bees and butterflies abounded. The rear of the villa led to a large, boulder strewn area supporting a growth of sparse grass, carib trees and thorny bushes. The invertebrate population here was made up of grasshoppers, spiders, large millipedes, centipedes and scorpions.

Inside the villa three Geckos, *Hemidactylus turcicus*, were permanent residents in the lounge and a single Gecko of the same species continually inhabited one of the bedrooms. Numerous moths and several Praying Mantises, attracted by the electric light bulb on the balcony, found their way into the villa and no doubt formed an ample food supply for the Geckos. Curiously enough, neither Geckos nor any other lizards were discovered on any of the ground around the villa, in spite of a regular 'stone-lifting' programme.

My first introduction to amphibian life in Crete was the discovery of a dead toad, *Bufo viridis*, evidently the victim of a car, on the villa driveway. Returning to the villa the following evening, well after dark, a full grown toad of the same species was picked out by the car's headlights as I drove into the car port. It was easily captured and taken indoors where it proved to be a beautiful specimen. Its dorsal surface was an uncompromising pink, heavily marbled with irregular dark brown patches. Ventrally it was white with round greyish-brown spots. I was particularly interested in the pink colour. None of the Green Toads I have kept in vivaria and none of the animals I have seen in the wild previously have been so intensely pink. I had found it hard to credit the pinkish illustration of *Bufo viridis* shown by D. W. Ovenden in the Field Guide to Reptiles and Amphibians of Britain and Europe, but I am now convinced of its accuracy.

The animal was confined to the bath (green) overnight for re-examination the next day. By 8.30 am the next morning the pink colouration had largely disappeared and an hour later, just prior to release in the garden, it had vanished completely and the toad assumed a pale brown dorsal surface marked with bright green patches. Numerous orange-red tubercles covered its back.

My next encounter with *B. viridis* was on a flat topped plateau, high above sea level and surrounded on all sides by steep mountain slopes. The very dry, boulder studded ground was covered with coarse grass and thorny bushes and the weather conditions cool, sunny and rather windy. Insect life consisted of many handsome ochre-coloured grasshoppers, Painted Lady and Swallowtail Butterflies and some dragonflies. Numerous large stones were turned over revealing in all six Green Toads, three under separate stones, two lurking together under a single stone and one in the

Bufo viridis showing pinkish coloration

long grass near a stone. One was one inch from snout to vent, the others one and a half inches. All had the characteristically shaped green blotches on a pinkish-brown dorsal surface. The bands on their legs were a particularly vivid green. These toads were only found high up on the plateau. None was discovered, in spite of diligent search, either on the sloping sides or lower levels. Green Tree Frogs, *Hyla arborea*, on the other hand, were found in olive trees at both higher and lower levels. This species was also met with high in the mountains near the site of the ancient city, Proessos.

Bufo viridis appears to be fairly strictly nocturnal in its habits. An adult female which has lived in my greenhouse for the last couple of years is rarely seen more than once or twice a week, whereas its companion, a large *Bufo bufo*, can be seen continuously throughout the spring and summer.

At the time of my visit, Crete was very dry indeed. Most of the river courses were entirely without water. In one, however, near Timbakion, although most of the river bed consisted of pebble covered flats, a fairly fast running, shallow stream coursed along one side. Along the border of this stream several three quarter inch long frogs were collected. Dorsally they were light brownish-green dotted with light brown spots and ventrally cream. Their legs were barred with rows of fine spots and the hind feet reached well beyond the nose. Although froglets of this size are not easy to identify, these were almost certainly Marsh Frogs, *Rana ridibunda*.

Group of Marsh frogs by garden pool

I have found Marsh Frogs ideal inhabitants of a garden pond. They are diurnal, rarely move far from water and spend most of the spring and summer squatting in full view, within easy jumping distance of the pond. They soon become tame enough to allow a close approach before 'plopping' into the water. The big female I have at present successfully survived last winter out of doors and from April to November could be seen every sunny day basking by the edge of the pond. She occasionally suffers from an attack of wanderlust, particularly in early summer, when she travels from the main pond in the back garden, up a nine inches high step, along a passage, and into a shallow pool in the front garden. The return journey is usually made two or three days later. Fortunately this has been the limit of her travels to date, probably because there is no standing water in any of the neighbouring gardens.

The only other stretch of water I found in Crete was a fairly large lake at Kournes. No amphibians were found but several small Stripe-necked Terrapins, *Mauremys caspica*, were seen poking their heads through a mass of water weeds near the bank. Two large terrapins of the same species were observed sunning themselves on an exposed rock about fifteen yards out in the lake.

No live snakes were encountered during my stay in Crete, in spite of extensive exploration of likely sites, and apart from the Geckos living in the villa, only two species of lizards, the Balkan Green Lizard, *Lacerta trilineata*, and the Wall Lizard, *Podarcis erhardi*, were found.

Six mature and one juvenile Balkan Green Lizards were seen on an exposed stretch of boulder strewn land covered with coarse grass and low bushes, near a stand of Holm Oaks, between Zenia and Pshiro. The adults were fine green lizards similar too, but rather larger than, the familiar Green Lizard, *Lacerta viridis*, which does not occur in Crete. The young one was brown with four to five lighter stripes along the sides. All were very nervous and disappeared rapidly when disturbed.

A single *Podarcis erhardi* was detected basking on a boulder among the Holm Oaks and on several occasions one ran across the road in front of the car, as I motored along mountain roads. Three were seen at close quarters on a gravelly beach, notable for its wasp and hornet population, in one of the little bays near Ferma and one on the outside wall of the balcony at the villa in the light of a torch at 10.00 pm. These Wall Lizards are about eight inches long with light and dark stripes along the back and sides of the body.

Hyla arborea on apple blossom

From a Naturalist's Notebook

by Eric Hardy

DOLPHINS WERE FIRST kept successfully in Marine aquaria in this country at Morecambe in 1964 and Brighton in 1968. After 16 failures to keep the salt requirement of some 2·5% for porpoises and dolphins in captivity at London Zoo over the past century, the society began its present progress with Whipsnade's water mammals exhibit in 1972. Lack of sodium chloride in the water or at least 10% seawater replacement daily kills off cells in their skin, which then becomes spongy and waterlogged. All the water (kept at 66°F) in the bottle-nosed dolphin pool at Whipsnade passes through high speed sand-filters every 3 hours, to avoid them polluting it. Chlorine treatment is constant to remove other contaminants. All their dolphins came from the Gulf of Mexico.

Dolphins first bred in captivity at Harderwijk Dolphinarium in Holland, where young have been reared. Whipsnade hopes it successfully mated a mature male from Clacton dolphinarium with one of their females last year. Dolphins don't mature before 10 or 12 years.

Fishermen as well as newspapers still confuse sharks (with vertical tails) from whales and dolphins (with horizontal tails). A stranded basking shark, our largest British shark, has too often been reported wrongly. But these are usually summer fish. The mystery of where basking sharks spend the winter may be solved by an Aberdeen University biologist's fitting basking sharks in Loch Fyne and off west Scotland with fibre-glass transmitters on the end of a trailing wire from the dorsal fin, in order to track their movements by satellite. This functions only at the surface, when they feed on plankton in shallow water. Each transmitter will have its own code to identify each shark U.S. biologists used similar transmitters to track porpoises.

Fungal Disease

Cellular immunity plays a large part in a fish's defence against fungal and bacterial disease. At Hull this is being studied with carp, trout, guppies and swordtails, breeding genetically identical fish for transplants and tracing their antigens, which are stimulated by the thymal gland. A similar technique produced diploid eggs in the clawed toad, which were activated by orradiated sperm. Selective breeding of mollies and guppies will aid the study of mutual graft rejection, and several benefits to aquaculture.

The cause of perch-disease, which is wiping out Windermere's once dominant perch, is still sought. Windermere perch have never returned to anything like their prewar numbers, prior to the unsuccessful canning of two-thirds of these fish producing too bony wartime "Perchines" for the British consumer. A few years ago, nearly a third of the fish became infected with fungus from which a million (98%) died. About 6,000 a year are sampled by the Freshwater Biological Association, but few fish over 2 years old survived the disease.

Aquatic Insects

Aquatic insects alone are so numerous that the amateur pond-dipper cannot get far on a popular picture book. One of the more general introductions is the new 6th edition of *Imm's Outlines of Entomology* (Chapman & Hall £7·50), edited by Prof. O. W. Richards and R. G. Davies of London University. For long a standard work, now updated, and illustrated with numerous line drawings, it helps to sort out the world's 800,000 species, from aquatic bugs like water-boatman and water-scorpions, pests of fish ponds, to caddis-flies, mayflies, 34 different stoneflies, alder-flies and dragonflies, none of which is a true fly, like our 32 mosquitoes or gnats, and midges. Even among moths, Chinamarks have aquatic caterpillars and those of the tiny rush-veneer were once confused for caddis-fly "creepers", whose evolution was close to moths, hence their adults' hairy wings.

Predatory aquatic insects can be pests of fish-fry, but dragonfly nymphs prey also upon other insects and small crustaceans. We have only 48 of the world's 5,000 dragonflies, whereas North America has over 360. The discovery of a new species fossilised in Bolsover Colliery in Derbyshire, with a wing-span 8 ins larger than existing British species, was one of the most important discoveries of recent years. Even rarer carboniferous fossils are remains of amphibia. Few have been found since the 19th century. The most important was discovered the other year at Cowdenbeath in Fife, one of the anthracosaurs, along with the skull of a lungfish.

Tortoises

A recent newsletter of the British Chelonia Group makes a strong criticism of the way tortoises are transported to this country by the trade, though would-be breeders are dependent upon imports. Members bred spur-thighed and Hermann's tortoises last year,

as well as European pond terrapins. Equally interesting was the discovery of the remains of a tortoise in the stomach of a fox killed near Bristol.

Darwin and Others

Christopher Ralling's recently published *Voyage of Charles Darwin* (BBC, £6·75), a background to the popular TV film, has much to say about the giant tortoises he found on the Galapagos Isles, for the story covered only the South American part of Darwin's world cruise on H.M.S. Beagle. Sufficient of his diary and journal is extracted to show Darwin's already astonishingly wide knowledge and interest in geology, entomology, and botany as well as birds and mammals. He came down from Cambridge, planning to be a leisurely hunting-shooting-and-fishing country parson, until this voyage changed his whole outlook on the history of life on earth. Nowadays, in a flood of Ph.D.'s luxuriating in heavily subsidised natural history jobs, surveying this and wardening that, researching this and advising on that, one constantly comes upon ornithologists with no similar recognition of, or interest in insects, or fish, or reptiles in the field; botanists and biologists who cannot recognise a common bird-call or a mammal's footprint; even ecologists, all knowing more and more about less and less and scorning the amateur field-naturalist's years of direct contact with wildlife, in water as well as on land, until one wants to use his experience.

This was neither the first book nor colour-film on Darwin's historic 5 years' voyage; but his marriage is unfortunately misprinted as 1939 instead of a century earlier. The cruise made Darwin's mind a card-index of fauna and flora upon which he cogitated along his famous "thinking path" in the garden at Down House in Kent, before elaborating his monumental theories, all backed up with so many examples. He was first hissed at by giant cactus-eating tortoises on Chatham Island and immediately thought they looked like antediluvian animals. Some 250 years ago, giant tortoises ranged from Madagascar, Aldabra and the Seychelles to Galapagos. In 1935, London Zoo discovered one in, of all places, an Oxford Street store and acquired it for Regents Park. First exploited by the Spaniards, they were already part of man's diet when Darwin reached Galapagos in 1835. In 1931, *Scientific American* lamented they were "nearing extinction" on Albemarle and Indefatigable. Charles Townsend tried to propagate them at New York Zoo after his 1930 expedition.

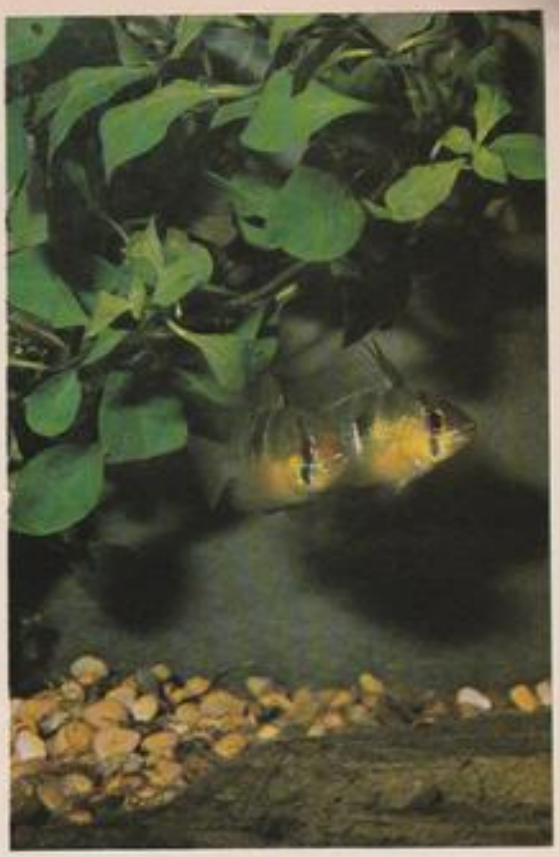
Long before Darwin, however, Dampier found them in amazing abundance when he visited Galapagos in 1684. It is strange that while Darwin described so much in terms of high admiration, his diary revealed little discernment of his later thoughts which gave the Victorians their greatest shock, as though he still took much for granted. The late Lord Rothschild used to collect giant tortoises; but I suspected he still harboured the Victorian ambition to have greater collections than anybody else. Some of his specimens at Tring weighed over 500 lb before he put an end to their existence. The cruise of the Beagle enabled young Darwin to turn his youthful passion for shooting partridge and snipe into collecting specimens. Collecting and observing became a ritual of his life.

In a school science exhibition in Liverpool the other month I saw an interesting new aquarium design with an extremely high surface area, giving maximum oxygen surface to water volume ratio, in tropical fish keeping. A shallow 3 foot wide, 6 inch deep triangular tank fitted into a corner wall, using no floor space, its polished wood top being removable. Its 2·25 square feet contained 5·5 gallons compared with an average 3 ft square aquarium with 25 to 30 gals weighing some 350 lb. It had no need for an air-pump and was simply constructed with a single safe mains cable, all electric connections being neatly and safely made. The wooden top or hood was taken off for an instant plug-in. It was as easy to clean and maintain as a goldfish-bowl, without the excessive weight and much easier access to all parts of the tank than conventional types.

The Ram

Microgeophagus ramirezi

by Chris Storey and Jane Richards



THE RAM, known scientifically as *Microgeophagus ramirezi*, is one of the many beautiful South American cichlids and along with angelfish and discus one of the most popular. It is very small for a cichlid growing to only 6–7 cm long (2½–3 inches) and is usually bracketed along with the *Apistogramma*, *Nannacara* and *Pelmatochromis* genera as a dwarf cichlid. The body is basically blue/grey but with a brilliant blue/mauve hue over most of the body with the exception of the head end which has a golden sheen. The fish also possesses various striking marks which make it instantly recognisable. These include the prominent black eyestripe which passes through the red eye, and a definite black spot on the side of the body. The leading edges of the dorsal and pelvic fins are also black but the fins on the whole are golden orange and endowed with blue spots. The snout is red and there are fine blue lines around the mouth which extend over the gill covers reminiscent of those shown by discus.

There is a general variability in the Ram's colouring and this can be somewhat dependent upon the lighting. For example the blue/mauve hue tends to become subdued under certain conditions. When the fish are disturbed the distinctive black patterning disappears and the body becomes cryptic. This condition is characterised by faint barring somewhat similar to that shown by perch. A horizontal stripe also becomes apparent. The fish we have were imported from South America and their colouring is finer and not as garish as the colouring seen in the Rams we now see for sale in shops. Such fish have a greater proportion of yellow and red over their bodies and lack the blue sheen of our fish.

The fins are large and modified. The dorsal fin is long with its dorsal margin concave. The first ray of this fin is short but the second and third rays are elongated, the third being much longer than the second. This condition is much more pronounced in the male than in the female. The pelvics are also elongated and can be so long that they reach the tail when folded alongside the body. These elongated rays play a role in displays during courtship and aggressive encounters.

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TO SLEEP— PERCHANCE TO DREAM?

DO OUR FISHES SLEEP?

by Clive R. Hollin

LAST YEAR when I first embarked upon the totally absorbing occupation of fish keeping I, as friends suggested, avidly read any and every book, magazine, periodical and pamphlet to do with fish that I was able to lay my hands on. As I read so, naturally, my knowledge expanded (as did the numbers of fish and tanks I owned): Water conditions, pH and dH were prime considerations; classification of species (good job I took Latin at school); types of plant, amount of light important here; community tanks, wouldn't do to put a discus in with the guppies and swordtails. And so on. A myriad of technical and informative facts on how to succeed in my chosen hobby were consicientiously read and digested. In the course of time the studying has paid dividends: I have now established my fish in a pleasing environment in which they breed successfully and plants flourish.

Unanswered questions

Thus having achieved this milestone the next thing to do was to sit back and enjoy the fruits of my labours. Countless hours watching the antics of my finned flat-mates set me thinking as to what exactly was going on in that tank. Perhaps I should explain that I am, by both training and profession, a psychologist so my wondering about the behaviour of my fish is perhaps more easily understood. In an effort discover more about piscine psychology I went back to the texts which had previously served me so well. My efforts went unrewarded. Hardly a word devoted to the topics which now interested me. However, I am fortunate in that working, as I do, in an academic institution I have easy access to books, journals etc. which the average man in the street might find difficulty in obtaining. Diligent research revealed at least some of the answers I sought concerning the behaviour of fish. Of all the questions I asked myself perhaps the most intriguing was what happened at the end of the day when the aquarium light is switched off? Is it, for the fish, a chance to sleep, even dream?

Well, the question proved to be enormously complex but the majority of writers on the topic of the somnolent state agree that fish do indulge is some sort of sleeping activity. Whether this is the same activity as we humans know as sleep, however is, quite another matter.

What is sleep? The most simple answer to this exceedingly complex question is, at the risk of stating the obvious, that in man sleep is an altered state of consciousness. Physiological evidence, principally the recording of the brain's electrical activity, argues that sleep is basically composed of two stages; these stages we may call dreaming and non-dreaming sleep. Each sleeping state is characterised by its own particular pattern of electrical activity in the brain. So if we take this sleeping behaviour of man as our model of sleep then there is widespread agreement that most mammals, e.g. dogs, cats, mice, etc., do indulge in sleep as we know it. Indeed, even as far down the evolutionary scale as birds there is evidence based on recordings from the brain that our feathered friends are not uninclined to snatch the odd forty winks.

Electrical activity

However, when we look at fish and amphibia the picture changes. Fish and amphibia, along with reptiles, have very different brains to mammals. Consequently the electrical activity of the brains of such creatures is vastly different from that seen in man and the rest of the mammals. Careful research has shown that whilst it is true that resting fish do exhibit a slight change in the pattern of their brain-waves from the waking state, the difference between the two is minimal and is no way similar to that exhibited by mammals. Thus it seems that whilst

fish (and reptiles) do indulge in some sort of sleeping behaviour in all probability, it is not the same sleeping experience as we enjoy each night.

So what are our fishes doing lying under that stone or plant when the light is out? Perhaps the best clue to what's going on is that the fish is motionless and concealed. In the natural state when the sun goes down so the water cools and body temperatures fall. As heat is lost so movement becomes slow and sluggish; as speed of movement is lost so the chances of being caught and devoured increase. In order to steer clear of such a sticky end the fish knows that it must be out of harm's way before sunset. What better way to remain undetected than to lie perfectly still, blending into a leafy or rocky background? Thus it seems that self-preservation is the prime motivation behind the sleeping behaviour of the majority of water life.

Sleeping habits

However, that's not to say that this behaviour cannot be of interest in itself. In the course of my reading I came across several interesting snippets relating to the various sleeping habits of certain specimens. The Bermuda reef fish, slippery dick, buries itself in the sand on the sea-bed, whilst the parrot fish wraps itself in a slimy envelope during its periods of repose. However, I think my favourite description was of the ritual carried out by a lowly mollusc. Observations of this creature, a sea hare, revealed that every evening as dusk fell it would retire to a particular spot in its tank and curl into a specific sleep position. It would stay in this position until disturbed by the first rays of the morning sun when it would move off to its feeding dishes in search of breakfast. The Axolotl may also be seen to adopt a specific sleeping posture. When asleep the Axolotl lies suspended at an angle in the water, with forelimbs slightly spread. Often the tip of the tail rests on some supportive medium, for example the floor of the tank or some aquatic plant.

There are reports that whilst in a sleeping state certain fish are slow to respond to disturbance; one writer even claims to have been able to lift a fish by hand to the water surface before it became fully awake and made a bid for safety. However, I must add that all attempts I have made to replicate this feat with my own fish have been unsuccessful.

So, to conclude, I'm afraid it seems very unlikely that the inmates of our tanks are indulging in fishy dreams of juicy *daphnia* and still waters whilst the lights are out. More likely they are functioning at a lower level of metabolism, preserving their safety and waiting for the next day's light in order to carry on with the cycle of their existence.

Pseudotropheus pindanii

Some observations by Frederick A. Burgiss

HAVING OBTAINED 5 young specimens from a London dealer, I placed them in a four foot community tank the pH of which was 7·8 and the temperature varied between 78°F and 82°F.

The other inmates of the tank were 5 young *Pseudotropheus Tropheops* and 3 *Labeotropheus Trewavasae*.

Within three months of purchasing them, they had attained maturity and I was very glad to find that I had 2 males and 3 females. I must point out that I was only able to sex the pairs when they had paired and spawned. Even the dealer from whom I bought the fish was not too keen on trying to sex them even though he is a breeder himself.

Both sexes appear to look the same, the overall colour being pale bluish mauve. The ventral fins are black edged with white the caudal fin is bordered black and edged white, the rays are also black. The anal fin is almost all black with white edges and the egg dummies—by which it is possible to sex them, are pale yellow. In the case of my pairs, the males have one large spot and the females two small spots.

When the pairs were in absolute peak condition, the males began digging pits in the gravel and burrowing under the large flat rocks in the tank. They chased away any fish that got too close to their own territory and displayed much in front of their respective females. When they got down to actually spawning, the pair began circling each other inside the pit, then they would stop and shimmer side by side, at this time the female would lay 1 or 2 rather large eggs. Then something unusual happened. The male picked up the eggs and then the pair locked jaws in typical cichlid fashion, I assume that the eggs were then transferred to the female's mouth. After about one hour the bulge in the females buccal cavity was quite noticeable.

After 16 days I removed the female and placed her in a small tank on her own; two days later she released 10 fry measuring approximately three eighths of an inch long. I commenced to feed the fry on fine powdered dry food and was quite amazed at the rate at which they grew.

One week later the second pair spawned.

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Sexing is easy in this species. Generally speaking the female is the smaller of the two sexes and she is more rounded. Her belly is red and the intensity of the red colouration increases when she is in breeding condition. She also has fine blue spots within the black mark on the side of the body. As already mentioned, the elongation of the fins in the female is not as great as in the male and the snout is not as red.

Origin

The Ram is a native of Venezuela, coming from the western tributries of the Orinoco. The habitat in this region of South America is savannah and the water is known to be soft. Most books prescribe soft and acidic conditions for Rams although a couple of books do say they prefer slightly alkaline water i.e. pH 7.3. The water ours are kept in is soft (D.H.3) but slightly alkaline at pH 7.2 and they do very well in it. The temperature is kept at between 26–28°C (78–82°F).

We have five of these fish, four males and one female, and the tank they are housed in is 36" × 12" × 18" and is fairly heavily planted with Amazon Swords and *Vallisneria*. There is a large piece of bog wood and lots of slate placed to provide cover, for the Rams are quite timid and easily frightened. Their eyesight is very good and often movements across the room 10/15 ft away will cause them to dash for cover.

Apart from the Rams the only other fish in the tank are two *Otocinclus* catfish and a *Corydoras paleatus*, plus six silver hatchet fish. The *Otocinclus* replaced a sucking loach we had acquired to keep the algae down but it developed the habit of chasing the Rams and generally behaving in a menacing manner. It often gave the appearence of trying to suck on to the sides of the other fish and so it was returned from whence it came.

The first time the female spawned none of the males were mature and so the eggs remained unfertilised. She laid about one hundred eggs which were creamy white and one mm. in diameter. These she guarded for one day until they fungused and she ate them. She has spawned eight times since then and has laid three hundred or more eggs at a time. Spawning has, on average, been every twenty-five days but there is no

regularity, with the minimum of twelve days and a maximum of forty-eight days between spawning.

Spawning is initiated by the female. She displays to the males and starts pecking at the chosen spawning site, usually a piece of slate. During this time the males are very active and vigorously engage one another in bouts of fighting. These contests are ritualised and no apparent harm comes to the contestants. The two males face one another head on, all fins extended, and they flare their gill covers. Their black markings become very intense as does the red coloration of the snout. From the head-on position they watch each other and make small forward movements as if to attack. Sometimes a fish will back down at this stage and glide slowly away. Often though, the fish dash at each other and this is so rapid that it is hard to tell if physical contact has been made. The fish then re-align themselves to make ready for another bout. Occasionally jaw-locking occurs but it is extremely brief.

Feminine wiles

The female for her part acts coyly. She will lead one male into the territory of another and this usually leads to a bout of fighting between the two males. Perhaps this is to enable her to assess which male is best so she can mate with him. In fact, the female has always spawned with the same male although there is no apparent bond between them at any other time.

The male displays to the female by extending all his fins and gliding sideways on in front of her. The pair come to lie side by side, head to tail, and beat their bodies against each other. During these bouts of courtship the female, having chosen the spawning site, will go and clean the slate by vigorous pecking. The male will aid her in this process although for only very short spells. The fish will also attempt to remove plants that are near to the site and any intruder is swiftly chased away. By this stage the bond between the pair is fully established and the male will often pass over the slate making shuddering movements. The female, too, glides over the slate as if egglaying and this can continue for at least thirty minutes before actual spawning begins. When she does begin to lay, the female lays 7–8 eggs at a time and as each one is laid she moves backward slightly so that each egg is placed on the slate. The male then glides over the eggs releasing sperm.

On one occasion we timed the whole process and from the beginning of courtship to the end of spawning three hours elapsed. The spawning process itself took one hour. During the courtship both fish are more intensely coloured than normal and the female goes a dusky grey. The anal papillae on both fish are clearly visible, the female's being visible first and it is slightly shorter and thicker than the male's.

Whenever we have left the eggs with the parents they have always been eaten within a couple of days, probably because the tank is, unavoidably, frequently disturbed by our movements. Because of this we now remove the eggs and hatch them in a glass jar which is left floating in the tank with a supply of air and a couple of drops of methylene blue. It would appear that the addition of methylene blue is very important since on one occasion when none was added over two hundred eggs fungused when usually only 20–30 do so.

Hatching

The eggs hatch on the third day (after about sixty hours) at a temperature of 27°C (80°F) and the fry are free swimming 2–3 days later. At this stage the fry were placed in a small tank 24" × 12" × 9". Feeding the fry with egg yolk in suspension and liquid fry food was not at all successful probably because these fish are so susceptible to pollution and we lost a whole spawning trying to make do with these substitutes for live food. The fry, though, are quite large enough, when first free swimming, to eat newly hatched brine shrimps despite what some books say, and they thrive on them, their stomachs swelling like red balloons. Later on the fry accept microworms, chopped *tubifex* and grindle worms. We have not been successful as yet in feeding them any type of dried food although the adults will readily accept it. In fact, the adults will eat nearly anything we give them including haddock, chicken liver, grindle worms, white worms, freeze-dried *tubifex* and mosquito larvae.

The fry are now three months old. They are slow growing, although they get through loads of food, mostly chopped *tubifex*. We have only about thirty fry left of the two hundred plus that were removed from the hatching jar as inexplicably, when about one month old, the fry began dying off at a rate of five to ten a day. During this period the rest of the fish seemed quite healthy and were feeding well. Paradoxically, it was the larger fish that died and they continued to do so despite all attempts to cure the malady. As occasionally a fish was seen flicking we tried various cures but they had no effect neither did increasing the rate of water or partial water changes. After a month the dying off suddenly stopped with just over thirty fish left. A charcoal filter was installed at this time, but whether this was the reason for the sudden decline in the death rate, or just coincident with it, is a matter for speculation. The filter is still in use and there has been no further loss of life.

The fry now have the black markings of the adults, and they also share their territorial and agonistic tendencies for it is usual to find a single fish guarding the food and chasing away intruders. Such despots have been removed and put into the adults' tank but a new despot has always emerged fairly quickly. We find there is very little interaction between the young and adult fish, the adults virtually ignoring the young. At the moment, though, the males are far too preoccupied with the female as she is just about ready to spawn again.

THE GARDEN POND

Early Spring planning and construction

by Arthur Boarder

THE EARLY spring is the best time for making a garden pond as it will be possible to complete it and stock it with water plants in time for the fishes when all is settled. The siting of the pond is the first consideration. If the garden has a slope, it will be well to site the pond at the higher level so that it will be easier to empty it when necessary. Also one should not construct the pond in such a position that rain water can run into it. However, if it is not possible to site the pond at a high level, the sides of the pond can be raised to obtain the same effect. In fact, this is a good idea as the raised sides will provide somewhere to dump the excavated soil.

Informal concrete pond with three different depths.

Leaves

To avoid leaves from falling into it in autumn, the pond should not be placed under or near to trees and bushes. As for a sunny position, this is not very important, but most ponds should be in a position to attract some sunshine. If it is possible to construct the pond near the house it will be an advantage as the water supply should be nearer and should it be necessary to run an electric cable for fountain, water-fall or filter, it will need less cable. There may be an outside water tap which could be used if not too far away, but make sure that the piping to the tap is not of copper which could be very dangerous to fishes.

Shape

Having decided on the siting of the pond, its shape will be the next consideration. If the garden is of a formal type, it will be well to make a formal shaped pond, such as square, oblong or oval. If, however, it is intended to include a rockery with a water-fall, or a bog garden, it will be better to make the pond of an informal shape. When constructing a formal pond, it is essential that it is of an exact shape, that is, a circular pond must be exactly circular and the square or oblong pond must have exact right angles.

To shape the circular pond the centre of the proposed pond must be marked with a stout peg. Then measure a piece of rope to the size of the radius and attach a ring at one end. With a stick at the other end, mark out the complete circle, having the ring over the peg whilst so doing. For the square or oblong pond, set out the four corner pegs roughly where you wish to make the pond. Then measure

Informal pond using butyl rubber with turf and paving stones for edging.

exactly from one corner to the opposite one at the other end. The two opposite corners must be exactly the same distance to give the four right angles needed.

For an irregular shaped pond a good plan is to throw a rope on the ground where the pond is to be sited and then move it about until the desired shape is obtained. A conspicuous mark must be made of the contour and if on a lawn, a wedge of grass should be removed.

Size

The size and depth of the pond will depend upon the purpose you intend the pond to fulfil. If the pond is intended to house Koi, then it should be of a good size. These fish grow to a large size and so it is important that their requirements are catered for at the outset. I consider that a Koi pond should not be less than 12 feet × 10 feet and at least 3 feet deep. Many Koi are imported from warm climes and so they are not too happy in a small and shallow pond throughout the winter. Some home-bred Koi may be able to withstand more cold, but it is as well to give plenty of depth so that the fish may be able to get well away from the surface in frosty times.

If the pond is intended to house some golden Orfe, I consider that a fairly large pond is needed. These fish can grow to eighteen inches long in a few years and, as they are fast swimming fish, a good sized pond is essential for them. As for the depth of a smaller pond, this should never be less than eighteen inches. It may not be necessary to provide this depth in most parts of the pond as even if only a small part is of sufficient depth, the pond should function all right. In 1937 I constructed a pond, mainly for breeding fantail goldfish, and made a fairly deep hole in one part of the pond. The rest of the base sloped gradually to this hole and so most of the mulm in the water soon found its way into this hole. A water lily was planted in the hole and so its roots were able to extract nourishment from the silt. At the time this breeding pond was constructed I made a shallow part in which the fish could spawn. This proved very effective as every season the fish resorted to this place to spawn. In my book, "Coldwater Fishkeeping," there is a picture of this pond with the shallow spawning area to the right. The illustration also shows a small pond to the rear which was used for growing on youngsters. If the pond is intended to be used as a spawning pond, then provisions can be made for a

shallow part where the spawning nests can be anchored. It is also advisable to keep the breeding pond on the medium or small side so that it will be possible to reach all parts easily and to be able to gather any eggs which may have been laid away from the spawning corner. If the pond is about 10 feet × 8 feet and of a depth of about two feet, then this should function well and house about four pairs of breeders.

Construction

Having decided on the site and shape of the pond, its method of construction must now be considered. It can be of concrete, fibre glass or fitted with a liner. Most fibre glass ponds I have seen are rather too small and shallow to be able to function as ponds for Koi or Orfe. For a small easily made pool they are all right, but the possibility of a bad freeze up in severe weather is to be feared. In my opinion the pond constructed with a good liner is by far the easiest type to make. A well made concrete pond can last for many years but is very hard work to make. To make a pond with a liner all that is needed is to dig a hole the size required and line it. It can then be filled with water and stocked right away if necessary. The concrete pond will need plenty of hard work as once the excavation has been made there is the mixing of the concrete to be considered. One point I must make here is that it is quite unnecessary to use any form of shuttering for the concrete. Some years ago I wrote a book on garden ponds and the publishers included an illustration of shuttering for making a concrete pond. This was quite against my wishes and if one tried to use the method depicted it would cost a small fortune for timber. There is no need to use any shuttering for the concrete pond as if the sides are at an angle of not more than 45 degrees there will be no difficulty in getting the concrete to adhere properly. After all, it is rather unnatural to find a pond in the wild with perpendicular sides.

Liner

I will deal with the use of a liner for constructing the pond. To estimate the size of the liner required, measure the length and breadth of the pond and add twice the depth to each measurement. It is possible to get any size liner made, but be sure that a good strong type is obtained. When the soil is excavated, it will be a good plan to pile it round the sides as this will not only find a home for the soil but can raise the pond to make cleaning out easier. When the hole is completed make sure that there are no sharp stones in the base and a layer of soft sand is an advantage but not essential. When the liner is obtained, wash it to remove any powder which may be present and then lay it in the hole. Now anchor the edges with slabs of concrete or heavy tiles. Water can now be run in and the liner will conform to the shape of the pond as the water enters.

The sides can now be dealt with by seeing that they are secure and if possible let the slabs overlap the pond by an inch or two. A complete path can be made round the pond with slabs, not only to secure the liner but to enable one to walk round the pond safely. It would be possible at this stage to plant the pond and even to stock it, as there is no fear that any harmful matter will come from the liner as could from a concrete pond from free lime. The planting and stocking of the pond will be dealt with later.

Concrete

The construction with concrete will now be described. Once the excavation is made, ram down all over to make the base very firm. This is important and the firmer the base can be made the better. The concrete mix can be applied in one layer or two. Where it is intended to use one layer, the mix should be made from aggregate, which is a coarse mix of stones and sharp sand, and cement.

The aggregate and sand should be clean and well washed, containing no soil or soft sand. The cement should be fresh and contain no lumps. There are two methods of using the mix. A first coating of very coarse mix can be laid and then a second one with a stronger mixture of cement to sand. A good guide as to amounts is three quarters of a yard of aggregate, half a yard of sharp sand and six cwts of cement. The mixture should be turned over three times dry and three times wet. Do not make the mixture too wet and try to get it all laid in as short a time as possible. Once cement has gone off it is difficult to get another layer to join up with it completely. If one can get a friend to help with the mixing and applying, it will be an advantage as a quicker job can be made and a more satisfactory one too.

If the mixture has been applied in one layer the surface should be well tamped over to bring up the smaller particles to near the surface. If the mixture is too wet it may tend to slide down the sides and the wetter it is the less should it be tamped down. In hot weather it is necessary to prevent too rapid a set, and this may necessitate the spraying of the surface from time to time. Once it has set well, say in a couple of days, water can be run in. Leave for a day or two and them empty, scrub it well round, clean out completely, and especially remove any white deposit. Then refill and repeat the procedure after a couple of days. Providing the surface has been well scrubbed round, the next filling can be permanent. There are materials which can be painted on the surface to prevent trouble from lime, but I have found that if treated as described the pond will be safe for fishes. It is possible that any coating could become loose after a time and then the free lime underneath would be exposed.

Following articles will deal with:—Planting; Stocking; maintenance and breeding.

WHAT IS YOUR OPINION?

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

Photographs by the Author

I SHOULD like to begin by correcting an error, for which I was not responsible, that appeared in the December, 1978 *W.Y.O.* feature. I included a letter from Mrs. Shirley Sowden, of Cyprus. Her letter commenced on page 369, jumped across a couple of pages of advertising, and continued on page 372—where it ended at the conclusion of the first new paragraph in the second column with the sentence: ". . .It's a fascinating hobby and the problems only add to the interest." Unfortunately someone omitted the concluding quotation marks and added quotation marks to the following four paragraphs which thus appeared to have been part of Mrs. Sowden's letter. The comments in the four paragraphs in question were my own, personal observations on diseases and cures. I hope that has clarified any confusion and that manufacturers of ". . .cures suitable for use by morons. . ." will send their samples to me.

New Zealand

The opening letter this month crossed the world to reach me. It was written by Mr. Peter Wheeler, of Tropaquaria, 55 Rosebank Road, Avondale, Auckland 3, New Zealand. Mr. Wheeler says: "Unfortunately any comments I make in this letter will be about topics you suggested in your article, several months ago, in the August, 1978 issue. As you can see from the letterhead, I own an aquarium shop. I also breed a few varieties at home—namely angels, discus and gouramies.

"Aquarium shows in New Zealand are much smaller affairs than those you have in England. I feel that the tableaux-type displays you have are distorting the hobby: people don't come to see an oil rig or an armoured tank or a castle with a few tanks in it. There is nothing of that sort here. But we do have furnished aquaria sections. I received a first and second in this section at two shows during the year. The most recent show (October, 1978) was a good show put on by a local club. There were over 100 entries, this being average-sized here. Fish of Show was a striped *Leporinus*. I find snails to be an absolute nuisance—unless they are large, e.g. *Ampularia* and red ramshorns. I had to strip tanks completely to get rid of small snails that polluted the water. I don't like using chemical treatments—and the 9 volt battery trick would burn all the *Aponogeton* seed heads, etc.

"Recent experiences breeding golden gouramies have produced some interesting results. Initially the spawning was a complete surprise. The sizeable pair were put into a 36 in. × 15 in. × 15 in. tank with U/G filtration, plenty of fontinalis, duckweed and water sprite (*C. thalictroides*). The temperature was 82°F and the pH 7·0. The male built a nest which was very thin and wide-spread. Unfortunately, the actual spawning or eggs were never seen. I did not consider the nest to have been constructed properly. Much to my surprise one morning hundreds of fry were hatched.

"I removed both parents. The water depth was about 8 in. above the surface of the gravel and within two days the fry were free-swimming. For the next week-and-a-half we used Liquifry—a lot of it. Gradually brine shrimps, hatched in big plastic bowls on the floor, were added. A powder food was also used at this stage. Aeration was slow and steady. Gradually the fry took on gourami shape. Weaning them onto finely-grated ox heart took a bit longer than we had hoped—but they finally accepted it. At this stage their colour was pinkish; and they also discovered their ventral fins could move. Because the tank was right in front of a window receiving afternoon reflected light a strong growth of cotton or thread algae was developing. I left the algae to grow as a supplementary food for the gouramies; also to feed silver dollars and moonlight gouramies at my shop. But, lo and behold, an *Aponogeton crispus* sprang up out of nowhere in one corner—and it's still growing tremendously without artificial light.

"We gradually increased the depth of the water to 14 in. At four weeks we sorted and separated. Approximately 130 were left in the original tank—plus the same number in two other 36 in. tanks, and at least 100 small ones given to an oscar and a knife-fish at the shop. At this stage an interesting development occurred: we noticed that the fish in the original tank, which received a lot of sun, developed the best finnage and colour. Body growth was largely unaffected. As the fish in the other two tanks all developed the same colour, only paler, I felt that the sun was having some effect. At this stage—now two

months old—the situation is still the same regarding colour. Power filtration has been added and in a fortnight the largest will be ready for sale at approximately 2½ in.

"During the latter stages of growth all gaps between lids were covered, weekly 20 per cent water changes were effected and a wide range of powdered and flaked foods was used. Also a once-fortnightly feed of live *Daphnia* was given—but still the bulk of their food was ox heart. If anyone would like further information on breeding angels or discus, or on setting up furnished aquaria for shows, I should be only to glad to pass on any tips." (Although the light from the sun probably caused the better coloration in the fish in the original tank, is there any possibility that the fishes' coloration could have been improved by their eating algae? It's an interesting piece of information in either case. B.W.)

Marines

Recently I visited an aquarist friend who kindly permitted me to photograph the marines he keeps in his recently-set-up marine aquarium. Several years ago, when Bob Crossan last kept marines, I obtained some reasonably-good photographs of his stock. Subsequently he gave up marines and concentrated on freshwater species; but the marine bug recently bit him again and he now has a beautiful tank sporting a selection of beautiful species. Photograph 1 shows one of his delightful clowns. The pair are always on the go and certainly add life and excitement to the tank. Please send me details of your experiences with marines. Bob has tried, on several occasions, to encourage me to venture into marines—but I'm too much of a coward.

Bob and his wife told me a sorry tale of how they lost all the coldwater fish in their pond. They had had most of the fish for many years and had never had any trouble with them. Some months ago the water quality in Bob's area deteriorated and when he changed some of the water in his pond the fish all died. It was a sad loss because most of the fish were large and quite tame.

Similar experiences have made some aquarists wonder about the possibility of insuring aquaria and fishes against damage or loss. Some comments on this possibility come from Mr. S. J. Barker, 9 Earl Drive, Giltbrook, Nottingham. He writes: "In the November issue, in response to a query from Mr. D. A. Ferris, you asked for details regarding the insurance, of tanks etc. Perhaps the following may be of interest. When I moved recently I had an all-glass tank, measuring 6 ft. × 2 ft. × 18 in., made to install in the dining-room. My contents insurance policy for my previous home had expired and I realized that approximately 125 gallons of water could make a bit of a mess should the tank burst. So I went along to my insurance broker to discuss the matter; and he advised me that a normal house contents insurance policy would *not* cover me for (a) the cost of replacing the tank and equipment, etc. or (b) the damage resulting from escape of water, except where the breakage had occurred as a result of a specific insurance risk such as fire, explosion, etc. In other words, I would be compensated for the total sum insured—including tank, etc.—if my house burnt down; but I would not be insured for damage resulting from accidental breakage of the tank; nor would the tank itself be covered. To overcome this problem he advised me to take out an all risks policy which would not only cover me for damage caused by breakage

Zebrasoma veliferum

of the tank but also for many other potential risks in the house—such as burning a hole in the carpet or three-piece suite, etc. However, this policy still did not cover the actual tank and equipment itself—only the damage caused by its breakage. So my precious £200 tank and equipment still did not have 'the strength of the insurance company round it'. Sensing my disappointment the broker offered to phone the insurance company to see what could be done. On the other end of the phone I thought I could hear the whirring of computers and clicking of programmes as the electronic brain set to work calculating the odds against this new, deadly risk occurring in my dining-room. And lo and behold thirty seconds later back came the answer: £1 per cent (one pound per cent). Very expensive, I thought. 'That's cheap!' said the broker. '£2 extra please, Mr. Barker.' He duly explained: a premium of £1 per £100 sum insured. So, my £200 tank was insured for an extra £2, with a special clause to this effect being written into the policy.

"I would point out that an all risks policy is dearer than a standard contents policy; but when one considers the damage that could result from the breakage of even a small tank it is well worth the extra. One also has the assurance of knowing that one is covered for a multitude of other events that could happen in one's home any day of the week. In case of difficulty I would be pleased to forward details of the specific policy on receipt of a s.a.e."

Thicklipped gourami

No. 24 Blackshaw Road, Old Glossop, Derbyshire, heads the letter I received from Master Daniel Bennett (thank you very much for the Christmas card, Daniel) who has the following to say: "In the November issue you asked about breeding the thicklipped gourami. About six months ago I bought two female thicklips from a pet shop in Lancaster. They were about 1 in. long. Four months later they were both full of eggs so I decided to get a male and try to breed them. Four weeks ago I found one in Bolton. The problem was that most shops sell thicklips in pairs as the female is not very colourful. However, in Bolton they had one single male in a tank of African gouramies. The staff in this shop were very friendly and helpful, and all the tanks are clean and well-stocked with good, healthy fish. As well as this they have a good stock of equipment and tanks. I think it is one of the best fish shops I have visited.

"The male thicklip was put into my 48 in. community tank with the two females. At first it paid no attention to them so I partitioned the tank off and put them in 1 ft. of space. I turned off the U/G filter to keep the surface quite still, and put in a plastic top from a fish food container for the male to build the bubble-nest under. The only plant was some Java moss covering the bottom.

"After six days nothing had happened so I took out the first female and put in the other one. Next morning the male had built a bubble-nest and was chasing the female round the tank. By 11.00 a.m. the female was circling the male round the nest. Then she pushed her head onto the male's body. The male clasped the female, holding her between his caudal fin and his head. The fish slowly sank to the bottom and as they separated about ten, tiny, transparent eggs floated to the surface. This was repeated until 100-150 eggs were in the nest. The male and female were removed. Unfortunately most of the eggs fungused and I was left with about seventeen fry. As I had enough room to keep only about ten of them it did not really matter. Two days later my female Egyptian mouthbrooder jumped over the partition and ate all the fry. I hope to breed them again soon.

"I have three tanks: a 24 in. one housing a pair of convicts that produced about 400 fry over a month; a 36 in. one containing a fast-growing *Osphronemus* gourami; and a 48 in. community tank housing

Egyptian mouthbrooders, convicts, Jack Dempseys, various loaches, a two-spot catfish, a banjo catfish, a whiptail catfish, three-spot gouramies, a croaking gourami, a severum, two silvini cichlids, a firemouth cichlid and a red-finned shark.

"What's happened to the *Exchange and Wanted* column? I often have convict cichlids that I have to feed to my large gourami; and at present I am looking for a male croaking gourami. P.S. I have a lot of some aquarium plant and would be happy to give some to your readers." (Daniel does not name the plant. If you would like to send for a sample don't forget to enclose a s.a.e. and a polythene bag—and write to Daniel at his home address. If anyone has exchange or wanted items please send me details

Heniochus acuminatus

on a *postcard* and I'll try to include them in these pages. Don't forget to include your name, address and, if you have one, telephone number.)

Mr. M. E. Pullan's home is at 11 Leyden Street, London, E.1. He has kept fishes for seven months and has a 40 in. × 15 in. × 12 in. tank and a 27 in. × 15 in. × 12 in. tank housing a variety of tropical freshwater fish all living in reasonable harmony with each other. Mr. Pullan writes: "I have U/G filters in each tank, use Gro-Lux lighting, and have no trouble whatsoever with plant growth. Three species of fish have spawned: zebra danio, neon tetra and angel fish. The latter are at present preparing for a second attempt. I have not yet raised any fry but I intend to try with the angels in a new tank on their own.

Burrowing Snail

"My main reason for writing to you is a sudden problem with a burrowing snail which has infested both tanks. Whence they came from I know not but it would appear as if they intend to stay." (The snail in question is the one I call the Malayan sand snail. B.W.) Mr. Pullan continues: "If I use a well-known remedy sold at my local dealer's I fear the snails will die under the gravel and cause me more trouble than I dare ask for. I regularly 'harvest' the snails and dispose of them—but it seems an uphill fight. What do you suggest? Finally, what's all the fuss about Java moss? Every month on reading your article I find a mention of Java moss—or so it appears. Please enlighten me." (Several years ago the plant in question appeared in one of my tanks—rather like your sand snails. The plant flourished and I gave it a mention in my column. It did not appear to be widely known amongst readers and, hence, I offered samples on several occasions. I received more than a hundred requests from readers in all parts of the world—from an obscure Scottish island to the medical school in a famous American university. Occasionally, in this feature, some readers report the progress of their samples. I suppose I started a minor craze concerning the plant in question—which I shall not name because you and Master Daniel Bennett have already done so in this month's feature. There is no simple answer to your problem with burrowing sand snails. They are present in most of my tanks and do less harm than any other species of aquatic snail that I have kept; indeed, these snails do not normally damage plants; and they are useful in that they consume some uneaten fish food and keep the gravel from caking—rather like a gardener with a hoe. Unless you wish to remove all calcium carbonate from your aquarium gravel, to help to maintain soft water conditions, I think you should leave the

snails to their own devices. As you will have noticed, the majority of this species of snail travel out of the gravel only during the hours of darkness. You could try tying a few small cubes of raw steak onto white nylon threads and lowering the cubes onto the gravel surface during the hours of darkness. After a few hours the threaded steak cubes should have attracted a batch of snails. The cubes can be pulled out on the threads and the clinging snails removed. The process may be repeated regularly, the segments of steak being changed daily to prevent pollution. The fish may also appreciate nibbling the raw meat. Unfortunately this process will not enable one to remove all snails because the species is a livebearer and young snails will continue to exist in the gravel—or elsewhere in the tank. I would not recommend the use of a chemical killer because the snails may die in the gravel and pollute the water. Baby snails probably entered the tank with aquatic plants—or when new fishes were introduced. If the snails are not doing any harm it would be easiest to leave well alone; or to make the occasional 'harvest' to keep stocks under control. I find these snails harmless and attractive. B.W.)

Photograph 2 shows Bob Crossan's zebra or sailfin tang. I phoned him earlier this evening to tell him that I'd printed the photographs that I took of his fish and that I'd a set of prints ready for collection whenever he'd time to call. He passed on the disappointing news that since I'd photographed his fish last week he had lost the tang and a banner fish (photograph 3). When I photographed the fish I observed that two of them bore white spots. Bob treated the condition with an appropriate cure—but to no avail. Have you kept either species? Unfortunately I do not know the proper names of the fishes—and I'm more than ever convinced that I should restrict my fishkeeping to tropical and cold-water freshwater fishes!

Marines

Mr. Keith Moyle lives at 9 Chatham Road, Hartlepool, Cleveland, and his subject is marines. "I started keeping marines some eighteen months ago after a two-year break in the freshwater side of the hobby. It was during many visits to a retailer's shop—a short distance from my home town—that I first saw the unmatched beauty of marine aquaria. I dearly wanted to own such an exhibit but at the time I was still at school and, therefore, short of cash. It was after some eighteen months at work, with the money needed (or so I thought, for success) that I embarked on this great hobby.

"I got together all the equipment needed for a 36 in. × 18 in. × 12 in. all-glass aquarium to be run under the semi-natural system. The first six months were a nightmare. I lost the original inhabitants—two domino damsels and, later on, an electric blue and a humbug damsel. Result: a disillusioned marine aquarist!

"I blamed my failure on ignorance and lack of experience and convinced myself I could succeed. It paid off. My next purchase, a common clown, is still alive and well, and since the addition of an anemone some five weeks ago it has looked much happier and healthier. Over the last year I have added an anemone rock, two pieces of living rock and one piece of *Goniopora* and, most recently, a beautiful piece of red, living coral. The fish are the clown, a bicolour angel and a splendid powder-brown surgeon fish, and last but not least a hermit crab—the sole survivor of my first six months and, incidentally, the cheapest acquisition at £1·50.

"They are fed on an alternate diet of flake and gamma-frozen foods which are all eaten greedily, each fish having its own favourite: the clown brine shrimp, the surgeon green diet, and the angel *Mysis* shrimp.

"Every six to eight weeks a five-gallon water change is carried out, with weekly additions of a trace element booster and an algal growth food—as well as a vitamin supplement and, of course, pH buffer when required. During the last year-and-a-half I've learned a lot by reading all available material: *Marine Queries*, library books and, most recently, I joined the B.M.A.A. for their excellent journal *Marinews*. My advice is: don't give up if you experience any early failure; try to find the cause and remedy it. Money is not nearly as important as I once thought in the successful cultivation of marine life. It's experience. I know I've still a lot to learn about this great hobby but I know I made the right decision eighteen months ago; but I hope I've given those thinking about going in for marines enough encouragement to give it a go. It's surprising what a little success can do.

"A warning to those who use clip-on external thermostats: the 'stainless' clip on mine did not live up to its title and began corroding within two months of installation. A thorough coating of poly varnish will prevent this and the possibility of unhappy consequences."

Insurance

Mr. Kevin Appleton sent the following comments from his home at 46 Oak Lane, Old Catton, Norwich, Norfolk. "I thought I would take up your query about insurance cover for damaged aquariums. About a year ago *The Aquarist* carried an advertisement from an insurance broker offering insurance cover for fish. An enquiry was made by letter and the brief reply stated that it had to be insured as an extension to a home contents policy and that only one (named) insurance company would issue this cover.

"A telephone call (long distance) to the broker was made, asking for further details of the cover as I wished to insure two expensive marine tanks, plus

several tropical and a coldwater one—and I was led to believe that cover would include accidental damage to equipment, loss of or damage to carpets etc., loss of livestock by accidental removal of heater plugs etc., and loss of livestock by malfunction of equipment. This cover would also include the cost of marine water. I asked for written confirmation of this; and when it didn't arrive, to avoid the cost of another long distance call, I rang the local branch of the insurance company concerned. They knew nothing about any sort of cover to this effect! However, as promised, they did look into the matter; and rang me back to confirm that this was a special cover arranged by *only one* of their other branches and that the cover did not include anything like what I had been offered by the broker.

"To cut a long story short, I did not take out the policy and simply have my aquariums covered against damage—and any resulting damage to carpets and furniture—on my existing house contents policy. I would certainly advise anyone to give very careful consideration to taking out a new policy covering loss of fish and I would be only too pleased to hear from anybody who might be able to offer a livestock cover to me as I am frightened to add up the cost of all my fish and invertebrates."

Warning

I'm concluding my column just before Christmas and with a touch of the Tam O'Shanters I'll issue my usual, annual warning: take great care when working with aquarium glass—especially if you are replacing a broken pane with a new one. On Christmas Eve some years ago I attempted such a task and when my left hand slipped it sustained severe injuries to veins, muscles, tendons and—worst of all—median nerve. Since the two operations that followed, all subsequent editions of *W.Y.O.* have been typed with the small finger of my left hand (the only digit unaffected) and the index finger of my right hand. Although I can type quite quickly with the two named fingers, life would be much easier if I were able to touch type and did not have to stop after every few words to refer back to original letters. This week a teacher colleague introduced me to an object called a copyholder. I'd never before heard of this item—and I must admit I've found it very useful for holding each letter while I'm typing it. Now when I have to flick my eyes from typescript to original I can find my place much more quickly. No doubt my Editor, Mr. L. E. Perkins, will be amazed when he receives this month's copy very much earlier than usual. My thanks to him for his patient toleration of my not-infrequently-late submissions during 1978. One frequently takes magazine editors for granted; but at the moment I'm going through my annual venture as editor of a glossy school magazine and I know just how much work and effort are involved in hounding down contributors, advertisements, art work and photographers. The problem is rather worse when the contributors are young people between the ages of 11 and 18 and one has to encourage them to venture into the field of creativity!

For a future feature please send me your opinions on one or more of the following. (a) Your aquarium club. (b) Conditioning fishes for aquarium shows. (c) Plants that flourish in fairly hard, alkaline aquarium water. (d) Your selection of fishes for a small, community aquarium. (e) Firms that supply aquarium plants by mail order. (f) Home-designed containers for transporting tropical fishes (avoid diagrams, if at all possible). (g) Cures you have used successfully to treat specific diseases in fishes. (h) Have any of your aquarium plants flowered? If so which—and under which conditions? (i) What is the best bargain you have obtained as an aquarist? (j) What are your opinions about any of the national societies associated with specific facets of the hobby? Please drop me a line—if you can find time.

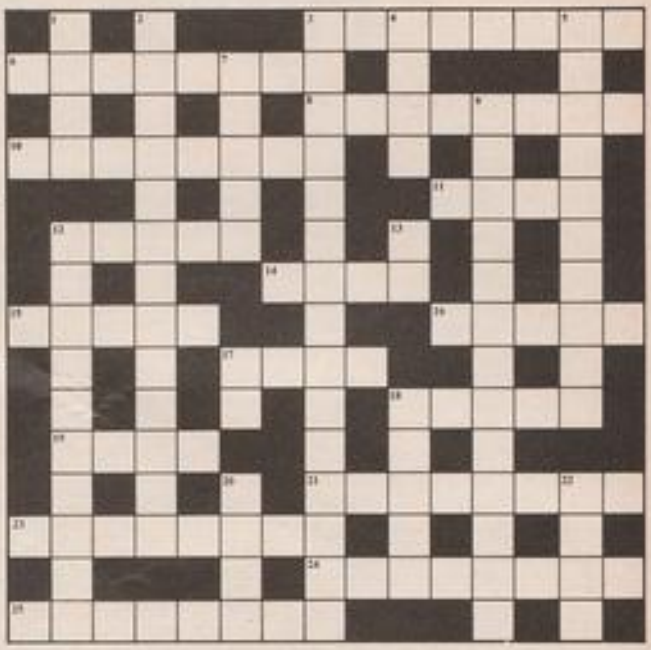
CROSSWORD PUZZLE

ACROSS

3 Is this bright little tetra a leader in the church? (8)
6 Someone just starting—to keep fish? (8)
8 This Madagascan cichlid sounds as if it needs air! (8)
10 Another name for the plant *Synnema triflorum*. (8)
11 The family name for toads! (4)
12 In wet, changes to be like 12 down. (5)
14 Should there be a gallon to each of these? (4)
15 A tasty fish from the rainbow. (5)
16 Stiff leader comes last in these petty squabbles between mates. (5)
17 What some fish might do to find lodgings. (4)
18 Sharp flavoured tetra? (5)
19 We give fish this, "little and often". (4)
21 This snail must have come from a sheep! (8)
23 Alas, some altered the Pigmy Sunfish! (8)
24 Would you make a diet of this? (8)
25 Colourful killi named after a collecting Captain. (8)

DOWN

1 I leg it to find this uncommon barb. (4)
2 Given out the ranges of native fish. (13)
3 Might this Anabantid have a cold? (8, 7)
4 Found in fins. (4)
5 Fatty protuberance, without 4 down. (7, 3)
7 A shark that looks after others? (5)
9 Places to exhibit our fish. (8, 5)
12 A variety of *Vallisneria*. (10)
13 Measured with litmus. (2)
17 Partner to 13 down? (2)
18 I, in capital of Peru, find a livebearer. (5)
20 Fish to keep underfoot? (4)
22 Not at all common! (4)



SOLUTION ON PAGE 470

OBITUARY

Mr. P. S. Campkin

It is with deep regret that the members of East London Aquarists and Pondkeepers Association report the death of their President, Mr. P. S. Campkin, at the age of 85.

During the past forty years Mr. Campkin's dedication to the furtherance of knowledge in all things aquatic was notable. He established himself as a practical fish breeder, of exceptional ability, particularly with Corydoras, Killiefish, Labyrints and live-bearers, during an era when little practical knowledge was available. His career as an Essex School Headmaster gave him ability to communicate information in an understandable form, many Society's and Aquarists will remember.

Perhaps his lasting contribution to the hobby will be seen in his ability as a forward thinking man, and administrator.

The foundation of the F.B.A.S., and its successful formative years was largely due to his efforts, together with noted contemporaries of E.L.A.P.A. as Capt. L. C. Betts, T. E. Butt, A. Arnold, C. W. Creed and A. Fraser-Brunner, who prior to 1939 conceived and drafted the original F.B.A.S. constitution. From 1947 until 1954, these gentlemen worked to achieve a National Federation of Aquarists, to bring together Aquarists with common interests, and policies. The G.S.G.B. and B.A.S.S. also developed through the demand for specialisation and Mr. Campkin aided this progress.

In 1950, he was elected Federation Chairman, and extended his policy of bringing Aquarists together with, in 1952, the Inaugural Meeting of the World Union of Aquarists, held in Holland, at which he was elected Executive Committee Chairman.

He recently attended the E.L.A.P.A. Open Breeders Show, a function he never failed to visit, and also the Associations A.G.M. two weeks later where he was re-elected as President, following his customary review of activities, given with customary wit and humour.

His many friends, and our hobby generally will miss a truly kind man. To perpetuate his memory, a Commemorative Award will be created, precise details to be announced at a later date.

Product review

TFH External Heater. Distributed by TFH (Great Britain) Ltd., Nutley Lane, Reigate, Surrey. 50 watt model £7·95 inc. VAT. 100 watt model £9·95 incl VAT.

About 50 years ago aquarium enthusiasts (this writer among them) accommodated and successfully bred many different species of warmwater fishes in tanks placed on open-topped boxes provided with hinged or sliding door on one side to allow for a parafin oil-heater (ordinarily a brass incubator burner soft-soldered into a flat-tin) to be housed beneath a thin sheet of copper or zinc. This simple device prevented the flame cracking the glass or slate an inch or so above the intervening hot-air space. Perhaps not surprisingly (to those with seed-raising experience) gentle warmth ascending through the compost never failed to promote a splendid growth of water plants (given the proper strength and duration of light) and, as extra bonus, plenty of stolons or runners on those plants which, in the normal course of events, produced them. On the darker side, without painstaking attention, sometimes as often as twice or thrice daily, wicks would work up and smoke or develop such a crown of sticky soot as to snuff themselves out. Then again, it was customary for an oily scum to form on the water within the space of a day and time, better occupied in attending to other things, had to be spent in drawing sheets of absorbent paper across the surface to take it off. Except for these disadvantages (two major ones) all went well: well, usually well. which brings me to the reason for the above nostalgic outpourings: a new type of electrical aquarium heater (now on the market) which has all the advantages of old-time bottom heaters (no wires hanging over the side of the tank and better distribution of heat at all levels) and none of their failings. This is the quite remarkable TFH External Heater.

At first glance it is recognisably a hot plate. The heating element, however, is something very special in design and component parts which, combined with resin-bonded insulating material sandwiched between sheets of cleverly simulated wood laminate with water-resistant qualities is almost certain to outlast by several years the conventional wire-wound electric heater. To go back to its water-resistant qualities, it is true to say that, water inadvertently dropped on or around the simulated wood base will not result in a burn-out or fusing of the domestic supply. All the same, as a precautionary measure, the aquarist is advised to wipe away all water spilled round the base of the heater plate when the operations of cleaning or topping up are undertaken.

Naturally an unfilled tank must never be placed on a switched-on heater. Moreover, the heater itself should be placed on a ½ in. thick sheet of expanded polystyrene. This will provide adequate protection against any scorching of a painted or polished surface beneath. Another thing, if the bottom of the aquarium overlaps the outside measurements of the heating plate by more than about an inch, then tailored lengths of expanded polystyrene should be used as wedged-in packing to prevent any strain being placed on the bottom glass. The TFH External Heater can be used with any aquarium thermostat but for best results, and a tidier appearance inside the tank, an external instrument is best.

The smaller of the two heaters is quite suitable for a tank up to 20 in. by 15 in. by 12 in. The 100 watt heater is advised for a tank of about 36 in. by 15 in. by 12 in. In an unheated room thickish sheets of expanded polystyrene, cut to size, should be stuck to the back and ends of the tank to slow down heat loss. It should be clear that this heat-retaining measure is of the greatest importance during power cuts. A few words more. This admirable heater cannot be cracked or put out of action by excavating or boisterous fishes as, for example, some medium-sized barbs, catfish or cichlids. Neither can fishes harm themselves by lolling, as some species do, against hot glass tubes. No wires, except those joined to an internal thermostat, need enter the aquarium at all. Indeed, the TFH External Heater is a milestone in safe, tidy and efficient aquarium heating.

JACK HEMS.

CROSSWORD SOLUTION

ACROSS: 3 Cardinal; 6 beginner; 8 *Oxylapia*; 10 Wistaria; 11 *Bufo*; 12 twine; 14 inch; 15 Trout; 16 tiffs; 17 digs; 18 Lemon; 19 food; 21 Ramshorn; 23 *Elarsoma*; 24 mealworm; 25 gardneri.

DOWN: 1 Geli; 2 distributions; 3 Croaking gourami; 4 rays; 5 Adipose fin; 7 Nurse; 9 Aquarium shows; 12 *tortifolia*; 13 pH; 17 DH; 18 Limia; 20 Sole; 22 rare.

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.

AT the **Killingworth Aquarist Association** annual general meeting, new committee members elected were: chairman, John Askell; secretary, Susan Metcalf; treasurer, Dave Horsefield; show secretary, John Rogan; shop, Pauline Horsefield; library, Leslie Metcalf.

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THE **Dudley and District A.S.** have changed their address from the Bull's Head Inn to the Pear Tree Inn, Lower Gornal, Near Dudley, Worcs.

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THE **Longridge and District A.S.** are planning to hold an Open Day for the general public early in 1979, so that they can see just what fishkeeping is all about. The event will include the annual Members' Show with extra classes for novices, a slide show, demonstrations and refreshments. It is hoped that presenting the activities of the club in this way will result in more members.

The scheme was drawn up at the Society's recent annual general meeting when it was also decided to launch a determined assault on the F.N.A.S. Show League next season. Longridge finished a creditable sixth in 1978 and would like to get into the prizes. During the evening the secretary repeated that the Society had faced problems during the year at their meetings, due mainly to the failure of some lecturers to honour bookings. It was also felt that they had been a little ambitious in doubling the number of meetings and it was decided to revert to meeting once a month on the second Wednesday. In this way a really full night could be planned for each meeting.

Table shows had been well supported over the year with an average of 30 fish shown in each of the five or six classes. The Society's Senior Show League had been won by B. and B. Durham, with T. and J. Durham second, and David Garstang third. David had also carried off the Junior League from M. and J. Bradshaw in second place, and Paul Durham in third.

A healthy balance sheet was presented and although the Open Show had not been quite as successful as in the previous year, it was decided to hold another in 1979.

Officials elected were: Chairman, Mr. John Tinker; vice-chairman, Mr. John Marsh; secretary, Mr. Don Matthews; show secretary, Mr. Albert Lyons; treasurer, Mr. Phil Kay; public relations officer, Mr. Barry Durham.

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AT the November meeting of the **Thorpe and District A.S.**, members were entertained to a slide programme on various topics including: Corydoras, Catfish, Reptiles and Terrapins, Marine fish, odd and unusual fish. Winners of the table show classes were as follows: Breeders: 1, Kevin Appleton (Giradinus); 2, Ivan Newby (Swords); 3, Paul Sparkes (3 spot Gouramies). A.O.V. Livebearers: 1, Paul Sparkes (Mosquito); 2, Colin Fearnley (Ameca splenders); 3, Kevin Appleton (Giradinus). Loaches: 1, David Cooper (Beaufort Botia); 2, Ivan Newby (Flying Fox); 3, Tim Driver (Redfin Botia). Angel Fish: 1, Kevin Appleton; 2, Gerry Balls; 3, Colin Fearnley. Breeders (Juniors): 1, Ian Briggs; 2 and 3, Jonathan Norton. Angel Fish (Juniors): 1, 2 and 3, David Hurn.

At the annual general meeting of the society in December trophies for the results of the years' table show were presented as follows: Class One: 1, Paul Sparkes; 2, Gerry Balls; 3, Tim Driver. Class Two: 1, Kevin Appleton and Gerry Balls; 2, Tim Driver; 3, Colin Fearnley. Juniors: 1, David Hurn; 2, Ian Briggs; 3, Jonathan Norton.

Officers for 1979 were elected as follows: Hon. President, Dr. David Ford; Chairman, Kevin Appleton; Secretary, Neville Newby, 125 Witard Road, Heartsease, Norwich; Treasurer, Colin Fearnley; P.R.O. & Table Show Secretary, Tim Driver; Membership Secretary, Trevor Cork (tel: Norwich 405176).

A full programme of events has been planned and new members are always welcome at the society's meetings held on the first Wednesday of each month at the Canary Public House, Heartsease, Norwich, at 8 p.m.

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THERE were 802 entries for the 1978 Open Show of the **Newbury and District A.S.** Results: Highest Pointed Newbury Member: C. Howe (T); Highest Pointed Newbury Junior: A. Hart (E); Best Fish in Show: A. Chaplin (Ch) (Independent); Highest Pointed Visiting Society: (Kingston); Best All rounder: C. and J. Richards (Sudbury); Best Cichlid: S. Pitcher (Dc) (Salisbury); Best Labyrinth: D. Goss (E) (Reading); Best Catfish: Mr. and Mrs. Lambert (G) (E. London); Best Guppy: J. Draper (O) (Hounslow); Best Coldwater: R. Saxton (V) (Kingston); Best Junior: A. Hart (E) (Newbury).

Class Ag: 1, Mrs. G. Rushbrooke (Reading); 2, M. Lambert (E. London); 3, Mrs. Rayner (Newbury); 4, P. Lambert (E. London). B: 1, M. Strange (Basingstoke); 2, D. Sheridan (Newbury); 3, D. Mackay (Kingston); 4, A. Chaplin. Ba: 1 and 2, E. and T. Tester (Mid. Sussex); 3, P. Lawrence (Reading); 4, T. Woolley (Saracens). C: 1, T. Cruickshank (Ealing); 2, B. West (Kingston); 3, Mr. Witteridge (Sudbury); 4, M. West (Kingston). Ca: 1, A. Chaplin; 2, M. Wright; 3, M. West (Kingston); 4, A. Feast (Tonbridge). Cb: 1, A. Chaplin; 2, M. Fox (Marlow); 3, J. Jupe (Gosport); 4, P. Lawrence (Reading). D: 1, F. May (Newbury); 2, D. Jennings (Havant); 3, P. Lawrence (Reading); 4, P. Fitchett (Nailsea). Da: 1, F. Cripps (Newbury); 2, E. R. Tubb (Bournemouth); 3, J. Jackson (Basingstoke); 4, Mr. and Mrs. Cotton (Port Talbot). Db: 1, C. and J. Richards (Sudbury); 2, P. Baker (Basingstoke); 3, A. Fuller (Kingston); 4, Mrs. Bebb (Bournemouth). Dc: 1, Mr. S. Pitcher (Salisbury); 2 and 3, W. Knight (Gosport); 4, Mr. S. Pitcher (Salisbury). E: 1, D. Goss (Reading); 2, P. Moye (Sudbury); 3, A. Hart (Newbury); 4, R. Collier (North Wilts). Ea: 1, R. F. Adams (Salisbury); 2, C. and J. Richards (Sudbury); 3, S. Fersseddon (Walthamstow); 4, J. Fisher (Newbury). F: 1, Mr. Witteridge (Sudbury); 2, T. Woolley (Saracens); 3 and 4, R. Prior (Newbury). G: 1, Mr. and Mrs. Lambert (E. London); 2, A. T. Willatts (Tongham); 3, C. and J. Richards (Sudbury); 4, P. Moye (Sudbury). H: 1, T. Cruickshank (Ealing); 2 and 4, J. Carpenter (Hounslow); 3, D. Mackay (Kingston). J: 1 and 2, P. Levine (Mid. Sussex); 3, A. Feast (Tonbridge); 4, Mrs. Bebb (Bournemouth). K: 1, D. Goss (Reading); 2, P. Lawrence (Reading); 3, C. Jackson (Reading); 4, M. Wright. L: 1, A. Feast (Tonbridge); 2, D. Sheridan (Newbury); 3, C. Jackson (Reading); 4, C. Newin (Basingstoke). Ma: 1, W. Knight (Gosport); 2, C. and J. Richards (Sudbury); 3, M. Myers (Newbury); 4, A. Fisher (Newbury). M: 1 and 2, P. Moye (Sudbury); 3, Mrs. Bebb (Bournemouth); 4, A. Ashwin (Riverside). N-Bm: 1, P. Rushbrooke (Reading); 2, P. Lawrence (Reading); 3, P. A. Moye (Sudbury); 4, D. Mackay (Kingston). N.o.T: 1, R. Townsend (Newbury); 2, B. Farmer (Rochampton); 3, J. Carpenter (Hounslow); 4, D. Kenwood (Nailsea). O: 1, J. Draper (Hounslow); 2, S. Fersseddon (Walthamstow); 3, W. Knight (Gosport); 4, J. Moyle (Fancy Guppy). P: 1, I. Sellwood (Newbury); 2 and 3, Mrs. Bebb (Bournemouth); 4, S. Fersseddon (Walthamstow). Q: 1, B. Farmer (Rochampton); 2, I. Sellwood (Newbury); 3, Mrs. M. Rayner (Newbury); 4, W. West (Salisbury). R: 1, Mr. and Mrs. Cotton (Port Talbot); 2, C. Robinson (Salisbury); 3, D. Kenwood (Nailsea); 4, Mr. and Mrs. Curtis (North Wilts.). S: 1, A. Chaplin; 2, Mrs. Bebb (Bournemouth); 3, R. Collier (North Wilts.); 4, D. Elliott (Newbury). T: 1, C. Howe (Newbury); 2, D. Elliott (Newbury); 3, D. Kenwood (Nailsea); 4, J. Male (Fancy Guppy). U.ad: 1, E. Binstead (Portsmouth); 2, Mrs. S. Brown (E. London); 3, D. Mackay (Kingston); 4, Roy Fox (Marlow). U.bc: 1, J. Pollard (Kingston); 2, W. Holland (Nailsea); 3 and 4, E. Binstead (Portsmouth). V: 1, R. Saxton (Kingston); 2, J. Pollard (Kingston); 3, E. Binstead (Portsmouth); 4, T. Longstaff (Kingston). W: 1, D. McKay (Kingston); 2, Bob Breet (Bexley Heath); 3, J. Brown (E. London); 4, B. Breet (Bexley Heath). X.bm: 1, J. Jackson (Basingstoke); 2, B. Young (Newbury); 3, D. Sheridan (Newbury); 4, M. Fox (Marlow). X.ot: 1, J. Carpenter (Hounslow); 2, A. Campion (Reading); 3, C. and J. Richards (Sudbury); 4, M. Thomas (Rhondda). X.uw: 1, S. Fersseddon (Walthamstow); 2, T. Longstaff (Kingston); 3, C. and J. Richards (Sudbury); 4, W. Woodward (Bexley Heath). Y: 1, 2 and 3, Mrs. G. Barrett (Newbury). Z: 1 and 2, E. and B. Lough (Kingston); 3, R. Saxton (Kingston); 4, P. Rushbrooke (Reading).

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THE committee elected at the 29th annual general meeting of the **Hounslow and District A.S.**, held on 22nd November were: Chairman, Mr. H. Parrish; Secretary, Mr. R. Nelhams, 35 Elsforde Avenue, Ashford, Middlesex; Treasurer, Mrs. S. Parrish; Show Secretary, Mr. T. Bolingbroke, 2 Holmwood Close, Addlestone, Surrey; Show Manager, Mr. R. Hart; Newsletter Editor, Mr. R. Allum; Social Secretary, Mr. A. Constantine; Librarian, Mr. P. Smith; P.R.O.: Mr. J. Carpenter; Trophy Secretary, Mrs. D. Craft; Floor members, Mrs. R. Brewer and Mr. C. Day. H.D.A.S. meet every other Wednesday at St. Stephen's Church Hall, Whitton Road, Hounslow, Middlesex. Starting the 1979 season on 3rd January at 8 p.m. New members, old members and visitors welcome.

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THE last quarterly fish show of the **East Anglian Federated Aquarists** for 1978 was held on Sunday, 10th December at Wensum Community Centre. The Norwich Society hosted the show on this occasion. The following aquarist societies took part in the show: Diss (D), Ely (E), Great Yarmouth (GY), Ipswich (I), Kings Lynn (KL), Norwich (N), Thetford (T) and Thorpe and District (TD). These quarterly shows are becoming increasingly popular with the East Anglian fishkeeping fraternity, and despite the inclement weather many members made round trips of over 100 miles to attend the show, for which there were 240 tropical and coldwater fish entered. While judging was in progress an auction of members surplus fish and equipment was held. The plaque for the Best Fish in Show was awarded to Mr. M. Laws of Kings Lynn for his Pseudotropheus livingstoni.

Results of the classes: Junior: 1, J. Norton (TD); 2, R. Culyer (N); 3, M. Curchin (N); 4, D. Thorpe (GY). Coldwater (Single): 1, T. Barnard (TD); 2 and 3, K. Appleton (TD); 4, H. Brundish (D). Coldwater (Twin): 1, H. Brundish (D); 2, J. Good (T); 3, A. Houghton (D); 4, N. Cobb (D). Coldwater (AOV): 1, H. Brundish (D); 2, K. Appleton

(TD); 3, J. Good (T). Breeders: 1 and 3, N. Newby (TD); 2, K. Appleton (TD); 4, A. Freeman (KL). Barbs: 1, N. Newby (TD); 2, S. Cowell (E); 3, A. Knights (GY); 4, M. Linder (TD). Characins: 1 and 2, N. Newby (TD); 3, P. Sparks (TD); 4, L. Arnold (N). Cichlids: 1, M. Laws (KL); 2 and 3, D. Cooper (TD); 4, G. Osler (KL). Dwarf Cichlids: 1, D. Knights (GY); 2, T. Cork (TD); 3, M. Linder (TD); 4, T. Cork (TD). Labyrinths: 1, G. Drewry (GY); 2, C. Burroughs (I); 3, S. and M. Crooks (TD); 4, K. Appleton (TD). Toothcarps: 1, S. Cowell (E); 2, F. Auffret (I); 3, M. Laws (KL); 4, M. Linder (TD). Catfish: 1, G. Osler (KL); 2, N. Cobb (D); 3, L. Arnold (N); 4, N. Newby (TD). Rasboras: 1, N. Newby (TD); 2, K. Appleton (TD); 3, D. Cooper (TD); 4, K. Appleton (TD). Danios: 1, A. Thorpe (GY). Loaches: 1, D. Cooper (TD); 2, F. Lovegrove (TD); 3, N. Cobb (D); 4, D. Cooper (TD). AOV Egglayers: 1, J. Crowson (E); 2 and 3, N. Newby (TD); 4, D. Cooper (TD). Pairs: 1, A. Wood (T); 2, G. Drewry (GY); 3, N. Newby (TD); 4, D. Woods (T). Goggles: 1, D. Turnbull (I); 2 and 3, M. Linder (TD); 4, D. Turnbull (I). Swordtails: 1, D. Turnbull (I); 2 and 4, G. Drewry (GY); 3, N. Newby (TD). Platies: 1, S. Cowell (E); 2, K. Appleton (TD); 3, C. Fearnley (TD). Mollies: 1, K. Appleton (TD); 2, N. Cobb (D); 3 and 4, C. Burroughs (I). AOV Livebearers: 1 and 3, C. Fearnley (TD); 2, K. Appleton (TD); 4, G. Osler (KL).

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AT the December meeting of the **Malvern and District A.S.** the chairman and secretary produced a slide show/quiz to entertain members for the evening. P. Parsons obtained top marks in the quiz and won for himself a four-outlet air pump. C. Baker took the junior prize. The table show for the evening was won by S. Sanders. P. Parsons won the junior prize.

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AT the annual general meeting of the **Southend, Leigh and District A.S.** held on 5th December, the following officers were appointed: President, A. Chapman; vice-president, F. Gardner; treasurer, R. Stanford; secretary, D. M. Cheswright, 2 Cedar Avenue, Wickford, Essex. Our Society meets at 8.30 p.m. on the first and third Tuesdays of each month at St. Andrew's Hall, South View Drive, Westcliff-on-Sea, Essex.

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THE general meetings of the **Portsmouth A.S.** have covered a variety of subjects during the last quarter of 1978 and they have, on each occasion, been well attended. Mr. R. Esson gave an excellent lecture on general fishkeeping which was of particular interest to beginners in the hobby.

The next meeting featured a slide lecture by the club chairman, Mr. J. Stillwell, on the subject of tropical fish he had kept in the past. On the same evening there was a table show for twin-tailed goldfish and any other species, native and foreign coldwater fishes, judged by Mr. V. Hunt. Every prize card was won by Mr. E. Binstead. The first meeting in October was devoted to a F.B.A.S. tape/slide lecture on anabantids by the late Mr. Frank Tomkins.

Mr. V. Hunt conducted a quiz at the following meeting. The members were divided into two teams and despite the fact that some of the questions were difficult, the final score on both sides was quite high. One notable feature of the proceedings was the surprising amount of knowledge displayed by one of the junior members, 14-year-old David Sleat, who correctly answered most of the questions that came his way. There was also a table show that evening devoted to single-tailed goldfish varieties, split into four classes and judged by Mr. J. Stillwell. The results were as follows: Goldfish, 1 and 2, E. Binstead. Comets, 1, E. Binstead. London Shubunkins, 1, 2 and 3, E. Binstead. Bristol Shubunkins, 1, 2 and 4, E. Binstead; 3, D. Sleat.

On 1st November members had a film show by Mr. R. Tremlett. Illustrated in colour were examples of his adventures in sea angling in the Solent. One of his frequent companions was Jack Hargreaves and between them they caught and displayed an interesting selection of fish.

The second November meeting was important for two reasons—Mr. K. Taylor of the Havant and D.A.S. gave a very interesting slide talk portraying a number of fishes featured in Portsmouth's August Exhibition and the table show was for 'My Best Fish' and the breeders' classes. The table show was judged by Mr. J. Stillwell and the results were as follows: My Best Fish, 1 and 2, S. Crabtree; 3 and 4, C. Forse. 17 in class. Breeders (Egglayers), 1, D. Forse; 2, Miss W. Ryder; 3, V. Hunt. Breeders (Livebearers), 1, 2 and 3, E. Binstead. Breeders (Coldwater), 1 and 2, W. Ryder; 3, E. Binstead.

The first December meeting was devoted to an excellent talk by Mr. Frank Willis, of Gosport, on tropical fish breeding, which he illustrated with live specimens and slides. He had with him a team of young cardinal tetras he had successfully spawned and reared at the first attempt. He had used a 10 in. × 7 in. × 7 in. all glass tank, black all round except for the front. Forty eggs were produced, only four of which fungused. Only two adult fishes were used and they were immediately withdrawn from the breeding tank after the eggs were laid. The eggs which were kept in the dark for three days hatched in four and it was five days before the newly hatched fry took food.

Mr. Willis also had with him a third generation of nine-month-old chocolate gouramies. He said that the water he used for breeding these particular fishes was very soft/acid; much too excessive for some neon tetras—they died! Also there were specimens of glow-light tetras, emperor tetras, congo tetras and Madagascar rainbows he had successfully bred. One other major feature of his lecture which was particularly portrayed in his slides was his breeding of the discus fish which, seemingly, he is able to produce by the thousands.

The last meeting of the year was devoted to a slide talk given by Mr. V. Hunt on his adventures in the United States of America.

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AT the December meeting of the **Northern Goldfish Society,** Bill Ramsden gave the President's Christmas talk. This was an extremely interesting, entertaining and hilariously funny account of Bill's early fishkeeping days. The members were told of his experiences working in a pet shop and some of the hair raising moments when taking charge of such animals as a Chimp and a Puma. After refreshments Brian Rothwell gave members the latest progress report on the Goldfish Standards book which the Northern Goldfish Society will publish early in the new year. The very fine finished drawings of the Veiltail, Fantail, Common goldfish, Shubunkin, Lionhead and Moor were on show and members gave their approval of them. The foreword introductory passages of this book, written by David Lord and Walter Gregory, were also given approval. A vote of thanks was given to Bill Ramsden and Brian Rothwell for all the hard work taken over these Standards.

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Catfish Association Great Britain. 1979 Committee elected at the A.G.M.: President, Mr. D. Lambourne; Chairman, Mr. R. Goodson; Treasurer, Mrs P. Lambourne; Secretary, Mr. D. Sands, 12a, Moorland Rd., Boxmoor, Hemel Hempstead, Herts.; Assistant Secretary, Mrs G. Sandford, 5, Victoria Rd., Earlswood, Redhill, Surrey; Show Secretary, Mr. T. Cruikshank, 82, Stanley Ave., Greenford, Middx.; Raffle Secretary, Mrs D. Cruikshank; Assistant Editor, Mr. M. Sandford (D. Lambourne remains Magazine Editor); P.R.O., Mr. J. Carpenter; Floor Member, Mr. D. Allison.

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THE **Catfish Association of Great Britain** Convention 1978. If the majority of aquarists did not believe that 1978 was "the year of the corydoras", even after Terry Cruikshank won the F.B.A.S. Supreme Championship with a corydoras Rabauti, then ask the 170 people who firmly believe it was. Those 170 people paid a mere pittance to see, and hear Dr. Han Nijssen and Mr. Isaac Isebrücker talk on Corydoras and Loricariidae at the 1978 Catfish Convention, in November. Han and Isaac flew in from Holland, to give the lucky audiences 5 hours of superb lectures in excellent English, on "Corydoras", backed up with "Loricariidae" and "Fish collecting in Surinam" (an account of Han Nijssen's 18-month stay in South America). The main lecture was on Corydoras, but Han and Isaac managed to cover only a small part of the work they have covered on the family. This was not surprising as they had been working on this South American catfish for fourteen years, with a short break to study some of the Loricariidae. The audience sat in appreciative silence to learn that the 124 named and valid types of Corydoras had been split into 5 main groups; these groups being decided on by regional and anatomical variations, and apart from these named types many specimens still awaited descriptions and names.

Many of the Loricariidae species shown on the excellent slides Han and Isaac backed up their lectures with, were not only new to members but some of the names were unpronounceable, though Isaac's excellent English proved they could be spoken with ease. At the end of the lectures the guests still managed to give a fast and furious question and answer session.

For those who attended the convention and did not have the time or energy to write down all the information presented, then the C.A.G.B. will be publishing some of the facts through its quarterly magazine, but please be patient—it took Han and Isaac 14 years.

Everybody would like to thank not only Han and Isaac for giving a good day, and for becoming members' friends, but also 1978 C.A.G.B. committee for all the hard work put into arranging such an event.

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Wycombe Marsh A.S. meet at The Swan, Abbey Barn Road, High Wycombe, at 8.30 p.m., on alternate Mondays. Meetings for this year are as follows: 19th February, Tape/Slide Show on Livebearers; 5th March, To be arranged; 19th March, Talk on Aquatic Plants by Ron Forder; 2nd April, Awaiting reply from speaker; 30th April, To be arranged; 14th May, Talk by Bob Esson (F.B.A.S. Chairman) on Furnished Aquaria; 11th June, Dr. David Ford of Aquarion Foods. Further details can be obtained from the Secretary, Mike Fox, 24, Kelvin Close, High Wycombe (telephone High Wycombe 38823).

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THE monthly meeting of the **Mid-Sussex A.S.** was held at the Fox and Hounds, Haywards Heath, on Thursday, 14th December. It was opened by Mr. N. Short (chairman), who welcomed members of Brighton and Sourthern Aquarists' Society to the Home Leg of the "Over the Downs" Interclub. A welcome was also extended to the Director of the Hadlow Aquaculture Centre, who gave a lecture on various aspects of the maintenance and breeding of Marine Fish and experiences of running a marine laboratory. The lecture also consisted of a very interesting film—titled "The Induced Breeding of Grey Mullet". The speaker also pointed out to the younger members that if they were interested in getting into the fish breeding and associated laboratory work as a trade, it did not need a university degree but a will to work and turn ones hand to any job which may occur.

The Interclub was judged by Mr. C. Pannel, of Hastings Aquarists' Society, who awarded the cards as follows: Class C (Characins): 1, J. Smith (Brighton); 2, P. Levine (Mid-Sussex); 3, T. Ramshaw (Brighton). Class L (Loaches): 1 and 3, B. Sayers (Brighton); 2, T. Ramshaw (Brighton). Class O (Guppies): 1, J. Birch (Mid-Sussex); 2, L. Pinney (Mid-Sussex); 3, D. Billings (Brighton). Class D (Cichlids): 1, Mr. & Mrs Smith (Brighton); 2, E. & T. Tester (Mid-Sussex); 3, T. Ramshaw (Brighton) Class M (A.O.V.) 1 and 2, T. Ramshaw (Brighton), 3, F. Hyne (Brighton). Class XPM (Breeders Egglayers): 1, R. Hard (Brighton); 2 and 3, B. Perrin (Mid-Sussex).

Brighton won the 2nd leg by 36 to 18 points. Brighton, having already won the first leg of the Over the Downs, therefore won the trophy. Further information from the Secretary, Mr. W. Slade, "Sundown", Bolney Road, Ansty, H. Heath (phone H. Heath 53747).

Port Talbot & District A.S. held their Annual Mini-Show recently at the S.C.O.W. Social Club, results of which were as follows: Class B: 1, Mrs E. Price; 2, Mr J. Dunne; 3, Mr. & Mrs R. L. Catton; 4, Mark & Tracy Price. Class C: 1, J. Dunne, 2, Mr. B. Fouracre; 3, Mr. J. Egan; 4, Mrs E. Jones. Class D: 1, C. Morrison; 2, J. Egan; 3, Mr. B. Fouracre; 4, Mr M. Price. Class E: 1, Mr. J. Dunne; 2, Mr. B. Fouracre; 3, Mrs Joyce Davies; 4, Mr. R. Perkins. Class J: 1 & 2, Mr. J. Dunne; 3, Mr. J. Egan; 4, Mrs T. Rees. Class O: 1 & 2, Jayson Arnold; 3, Mr. R. Arnold; 4, Mr. B. Fouracre. Class Q: 1, Mr. R. Perkins; 2 & 3, Mr. & Mrs R. L. Cotton; 4, Mr. J. Egan. Class R: 1, Mr. & Mrs R. L. Cotton; 2 & 3, Mr. R. Perkins; 4, Mr. J. Egan. Class S: 1, Mrs E. Price; 2, Mrs E. Jones; 3, Mr. B. Fouracre; 4, John Francis. Class W: 1 & 2, Mr. B. Fouracre; 3, C. Morrison. A.O.V. Tropical: 1, Jayson Arnold; 2, Mr. J. Egan, 3, C. Morrison; 4, Mr. B. Fouracre. Total entries, 97. Judges, Mr. Paul Willis, Mr. Clive Davies, Mr. J. Egan.

While judging was in progress, a very interesting lecture was given by Mr. Paul Burton, on unusual livebearers. Meetings held fortnightly on Tuesdays at 7.30 p.m. at the Tailbach Youth Centre, Margam, Port Talbot.

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"Tank Maintenance" was the subject of a slide and tape show at **Evesham Fishkeepers' Society's** December meeting. The first round of the Fish of the Year contest (featuring Swordtails) was held, with the following results: 1, Miss M. Goll; 2, B. R. Goll; 3, Miss C. Thornton; Joint 4, Miss J. Chester and Mrs A. Biddle. Results of the Table Show for A. V. Sexed Pair: 1, D. Goll; 2, Mrs J. Hessel; 3, S. Biddle. The Society meets on the first Wednesday of every month at 8.00 p.m. at the Hampton Scout Hut, Pershore Road, Evesham. Visitors and new members welcomed. Club secretary, Mr. M. Pattison, 22, Dudley Road, Honeybourne, Evesham, Worcs. (Phone Evesham 831415).

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AT the Annual A.G.M. of the **Gt. Yarmouth and District A.S.** held at the Imperial Hotel the new officers elected were: Chairman, R. Durrant; Vice Chairman, R. Stearne; Secretary, P. Watson; Treasurer, D. Lacey; P.R.O., A. Kemp; Show Judge Sec., G. Drewry; Asst. Secretary, M. Watts; Committee Members, D. Knights, T. Thorpe, J. Cannell, R. Czykiets Junior, D. Thoppe. Club nights first Monday in every month at the Imperial Hotel at 7.30 p.m. New members welcome.

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DESPITE the fact that **Skelmersdale & District A.S.** has only been formed for a couple of years they reached many milestones in their short lifetime. During late '77 and early '78 they travelled to many open shows where members won quite a few honours for the club. In mid '78 they were asked by the organisers of the West Lancashire Show to take part in the show and put on an exhibition, which went very well indeed and the public appeared to be showing a great deal of interest in it. They also, during '78, decided to enter the B.A.F. at Belle Vue. Despite the hard work put in by several of dedicated members not all members expected to do very well as this was their first time of taking part in this show. But on arriving at Belle Vue on the Saturday of the show, knowing that the judges had been round on the previous Friday, and had made their various decisions, they were amazed to find that we had won the following honours: I. McCartney: 1, Furnished Aquascape; 1, Carps & Minnows; 3, Breeders (Livebearers). B. Wilson 2, Characins; 3, Dwarf Cichlids. J. Clark: 2, Mollies. G. Kenyon: 2, A.O.V. Tropical; 3, Breeders (easy). F. Sommers: 3, Breeders (hard). C. Martin: 3, Angels. Thanks not only to the members who really did work very hard on this venture, but also to local pet shop owner, Mr. D. Oakley who now alas has gone into another business, but who was good enough to lend his van and also his stand for the Belle Vue show.

Following very favourable results at Belle Vue, they decided to run their own inter club show between Leigh A.S., St. Helens A.S. and themselves. At the end of November this was organised at very short notice and thanks are due to members of all three clubs for making it a success. Despite the bread strike etc. one of the members, Mr. F. Sommers put on an excellent spread for all three clubs and many thanks are due to him. Also thanks are due to the committee members of the old Comeades Club in Skelmersdale, who allowed them to run the show in their hall.

Results of the inter club show: Guppies: 1, C. Martin (Skem.); 2, M. Coates (St. Helens); 3, B. W. Carter (St. Helens). Platies: 1, A. Unsworth (St. Helens); 2, B. W. Carter (St. Helens); 3, G. Lawless (Leigh). Swordtails: 1, E. Jones (Leigh); 2, Mr. & Mrs G. Williamson (Leigh); 3, B. W. Carter (St. Helens). Mollies: 1, B. W. Carter (St. Helens); 2, T. Penny (St. Helens); 3, Mr. & Mrs Weaver (Leigh). A. O. Livebearers: 1, E. Jones (Leigh); 2, G. Lawless (Leigh); 3, H. Picher (Skem.). Small Characins: 1, B. Wilson (Skem.); 2, R. Boardman (Leigh); 3, I. McCartney (Skem.). Large Characins: 1, B. Dean (St. Helens); 2, F. Sommers (Skem.); 3, A. Wright (Skem.). Small Barbs: 1, R. Boardman (Leigh); 2, G. Lawless (Leigh); 3, B. W. Carter (St. Helens). Large Barbs: 1, R. Boardman (Leigh); 2, B. Wilson (Skem.); 3, Mr. & Mrs G. Williamson (Leigh). Small Anabantids: 1, Mrs. D. Martin (Skem.); 2, G. Lawless (Leigh); 3, I. McCartney (Skem). Large Anabantids: 1, F. Sommers (Skem.); 2, B. Wilson (Skem.); 3, A. Wright (Skem.). Fighters: 1 & 2, D. Ridyard (Leigh); 3, Mr. & Mrs. G. Williamson (Leigh). Small Cichlids: 1, B. W. Carter (St. Helens); 2, B. Wilson (Skem.); 3, Mrs D. Martin (Skem.). Large Cichlids: 1, T. Penny (St. Helens); 2, G. Lawless (Leigh); 3, R. Boardman (Leigh). Angels: 1, Mrs D. Martin (Skem.); 2, G. Kenyon (Skem.); 3, R. Wilson (Skem.). Rift Valley: 1 & 2, B. Wilson (Skem.); 3, A. Waterhouse (Leigh). Toothcarps: 1, P. Martin (Skem.); 2, E. Jones (Leigh); 3, R. Boardman (Leigh). Minnows: 1, T. Penny (St. Helens); 2 & 3 G. Lawless (Leigh). Danios: 1 & 2 I. McCartney (Skem.); 3, T. Penny (St. Helens). Rasboras: 1 & 3, F. Sommers (Skem.); 2, B. W. Carter (St. Helens). Corydoras Cats: 1 & 2, B. W. Carter (St. Helens); 3, G. Lawless (Leigh). A.O.V. Cats: 1, E. Jones (Leigh); 2, I. McCartney (Skem.); 3, R. Boardman (Leigh). Loaches: 1, I. McCartney (Skem.); 2, G. Lawless (Leigh); 3, T. Penny (St. Helens). Sharks: 1, P. Baugh (Leigh); 2, H. Picher (Skem.); 3, S. Martin (Skem.). Flying Foxes: 1, A. Rimmer (Skem.); 2, B. W. Carter (St. Helens); 3, G. Lawless (Leigh). A.O.V. Tropical: 1, G. Kenyon (Skem.); 2 & 3, J. Clark (Skem.). Junior Livebearers: 1 & 2, G. Lawless (Leigh); 3, A. Rimmer (Skem.). Junior Egglayers: 1, M. Coates (St. Helens) 2 & 3, G. Lawless (Leigh). Ladies: 1, I. Lawless (Leigh); 2, D. Ashcroft (Skem); 3, Mrs T. Penny (St. Helens). Goldfish: 1, G. Lawless (Leigh); 2, L. Beeley (Skem.); 3, Mrs Y. Cash (Skem.); Fancy Goldfish: 1, G. Lawless (Leigh); 2 & 3, L. Beeley (Skem.). A.O.V. Coldwater: 1 & 2, S. Lomas (Skem.); 3, E. Jones (Leigh). Pair, Livebearers: 1, E. Jones (Leigh); 2, A. Unsworth (St. Helens); 3, J. Clark (Skem.). Pairs, Egglayers: 1, J. Clark (Skem.); 2, M. Coates (St. Helens); 3, B. W. Carter (St. Helens). Breeders, Livebearers: 1, E. Jones (Leigh); 2, G. Lawless (Leigh); 3, A. Unsworth (St. Helens) Breeders, Egglayers: 1, F. Sommers (Skem.); 2 & 3, D. Ridyard (Leigh).

There were 255 entries. The best in show was a Festive Cichlid (gaining 75 pts) owned by T. L. Penny of St. Helens A.S. Final result: Skem. & D.A.S. (87 pts), Leigh A.S. (81 pts), St. Helens A.S. (48 pts).

P.R.O.—F. C. Cash, 39 Uppingham, Skelmersdale. Lancashire WN8 8HD.

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AT the meeting of **Aberdare A.S.** held on 21st November, Aberdare met Abertillery in the first round of the Welsh League. Results: Livebearers: Aberdare (19 pts); Abertillery (2 pts). Egg Layers: Aberdare (14 pts); Abertillery (7 pts). A win for Aberdare by 33 pts to 9 pts. Judges were Mr. P. Willis and Mr. C. Turner. During the judging an interesting slide show and talk was given by Dr. N. Carrington on his recent visit to the Far East Fish Farms.

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THE **Swillington A.S.** will be holding its 1979 Mini Show on the 21st March and Open Show on the 17th June—venues as yet to be clarified. Further details will be available from the Secretary, Mr. P. Campling 14, The Green, Green Lane, Garforth, Leeds LS25 (Telephone No. 868605).

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THE following were the winners of the **East London Aquarist and Pondkeepers Association's** open show held in October. Class XD—Breeders' Cichlids: 1, D. Byefield (Romford); 2, F. Vickers (E. London); 3, T. Glass (Hendon); 4, R. Campion (E. London). X.DB—Dwarf Cichlids: 1, A. Waller (E. London); 2, Mrs. M. Waller (E. London); 3, J. Charrington (E. London).X.E.—Labrynths: 1, Mrs. P. Chandler (Walthamstow); 2 and 3, R. Champion (E. London); 4, A. Campion (Reading). X.FA—1 and 2, S. Beay (E. London). X.F—E.L.T.C.: 1 and 3, C. Chewwright (Southend); 2 and 4, J. Boss (E. London). A.O.V. Egglayers: 1, B. Thoday (E. London); 2 and 4, D. Ruth (Ilford); 3, S. Webb (Harlow). A.G—Mini Furnished: 1, D. Byefield (Romford); 2, D. Seaman (Ilford); 3, K. Wrightson (E. London); 4, P. Murdoch (Harlow). Aa.b—Club Furnished: 1, Harlow; 2, East London. Ad.e—Ind. Furnished: 1, Mrs. S. Brown (E. London); 2, Mrs. M. Lambert (E. London); 3, A. Waller (E. London). Za—Rooted Plants: 1, 2 and 4, Mr. and Mrs. Lough (Kingston); 3, Mrs. P. Harris (E. London). Z.Bc—Floating and Cutting Plant: 1, D. Byefield (Romford); 2, Mrs. M. Waller (E. London); 3, Mrs. A. Waller (E. London); 4, Mrs. R. Boss (E. London). X.B—Barbs: 1, R. Campion (E. London); 2 and 3, J. Boss (E. London); 4, M. Shelton (d. London). X.C—Characins: 1, B. Argent (E. London); 2, Mrs. P. Chandler (Walthamstow); 3 and 4, J. Boss (E. London). X.Jk—Dan. Ras. Min.: 1, D. Hickman (E. London); 2, T. Waller (E. London); 3, Mrs. P. Chandler (Walthamstow); 4, R. Campion (E. London). A.O.V. Livebearers: 1, G. Carpenter (Medway); 2, D. Byefield (Romford); 3, R. Campion (E. London); 4, T. Wooley (Saracens). X.T—Breeders Class T: 1 and 3, G. Carpenter (Medway); 2, D. Chewwright (Southend); 4, A. Campion (Reading). N.B—Pairs (Barbs): 1, Mrs. R. Boss (E. London); 2, C. Chewwright (Southend); 3 and 4, A. Campion (Reading). N.P—Pairs (E.L.T.C.): 1, C. Chewwright (Southend); 2, B. Movay (E. London); 3, R. Boss (E. London); 4, Mr. and Mrs. Lough (Kingston). Pairs (Livebearers): 1 and 4, P. Gardiner (E. London); 2, T. Wooley (Saracens); 3, D. Wood (E. London).

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THE **Merthyr A.S.** held their annual all-card winners show in December, incorporating the Champion of Champions for 1978. Results:—1, P. Willis; 2, R. Morgan, 3, P. Willis; 4, R. Morgan. K.O. Live: 1, P. Willis, 2, R. Morgan. K.O. Egg: 1, N. Clifford; 2 and 3, E. Morgan. Junior: 1, N. Clifford; 2, C. Morgan, 3, D. Morgan; 4, P. Jones. During the evening it was possible to announce the Aquarist of the Year. Results: Senior: 1, R. Morgan; 2, E. Morgan; 3, P. Willis; 4, M. Hagerty.

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AT the January meeting of the **Malvern and District A.S.**, due to the sudden indisposition of their guest speaker, the meeting was at very short notice entertained by their chairman, who gave a most interesting and informative talk on water chemistry and its importance in fishkeeping. Table shows results were as follows:—Senior: 1, A. Parsons (Botia Sidmunki). Junior: 1, C. Baker (Capaeta Semifasciolatus).

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AT the recent Champion of Champions Competition of the **Roehampton A.S.**, the winner was J. Hughes, with a Corydoras micros. The Society officials elected at the annual general meeting for 1979 were: K. Hills (President); J. Hughes (Treasurer); R. Watkins (Show Secretary). The Club meets on alternate Wednesdays at the Senior Citizens' Club Room, Danebury Avenue, corner of Minstead Gardens, Roehampton, at 8 p.m. New members are always very welcome. Secretary: Mr. B. Farmer, 65 Armoury House,

Armoury Way, Wandsworth, London SW18 1HD.

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THE following members of **Blackpool and Fylde A.S.** have been elected to office for the year 1979: President and Technical Advisor, B. Simmons; Chairman, D. Wright; Vice-Chairman, J. B. Kenyon; Secretary, B. Frost, 103, Chatsworth Avenue, Fleetwood. Asst. Secretary, K. Smith; Table Show Secs., D. Moseley and D. Schofield; Librarian, G. Moseley; Treasurer, A. Ruffell. Committee: S. Wilson, J. Briers, B. Hill, A. Casey, S. Casey, W. Kenyon and J. Bradley.

Great things are expected for the club this year as membership is rapidly expanding, and everyone is eager to make the club even bigger. Their new, as from the beginning of last year, venue, has proved very successful. Now even the licencee of the "Stanley Arms" (venue) has joined the club. Lectures and all the year's programmes have been well received. Next year's programme is being organised now.

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AT the A.G.M. of the **Zenith A.S.** held on Monday, 8th January, the following officials were elected: Chairman, T. Robinson; Vice-Chairman, J. Shadlock; Secretary, J. Jackson, 2 Lindale Gardens, Ashby; Treasurer, Mrs. B. Jackson; Show Secretary, R. Tuplin; Entertainments Secretary, Mrs. P. Hewitt; Advertising and Press Officer, M. Cooney, 9 Mallard Road, Scunthorpe (tel: 51280).

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AT the annual general meeting of the **Bridgewater A.S.** held on Wednesday, 3rd January, at their usual venue, "The Golden Lion Hotel," Farnworth, the committee elected for the year were: Chairman, R. Horsfield; Secretary, D. W. Newman, 33 Newearth Road, Worsley, Manchester (tel: 061-799 9672); Treasurer, D. Mason; Show Secretary, M. Burgoyne, 15 Pansy Road, Farnworth, Bolton (tel: Farnworth 792263); Librarian, D. Jones; Working members, S. Ainscough and G. Chadwick.

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Novos T.F.C. changes of officers: Chairman, Mr. M. Hall; Secretary, Mr. P. Caddle, 47 South Street, Deckham, Gateshead (tel. 783007); Treasurer, Mr. T. Bolam, Show Secretary, Mr. J. English; Asst. Show Secretary, Mr. J. P. Caddle.

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Trowbridge & District A.S. held their annual general meeting on 9th January. The Committee members elected were: chairman, Mr. W. Burton; vice-chairman, Mr. M. Pattrick; secretary, Mrs. M. Bennett, 30 Lewis Crescent, Frome, Somerset; show secretary, Mr. J. Bennett; treasurer, Mrs. Burton. Other committee members, Mr. A. Wing and Mr. P. Grist.

Mr. Burton then reviewed the last year, saying that it was very rewarding in respect to finance and membership, also that 1979 promised to be very busy with the Club Show in May, and the Interclub Competition. Dr. Ford would be giving a lecture, and it is hoped to have many interesting films for the meetings. The Society will now be meeting twice monthly, the second and last Tuesdays in each month at the Rowing Club, Bradford-on-Avon at 8 p.m.

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THE **Coventry Pool and Aquarium Society** has moved its meeting place from the "Heath Hotel" to St. Christophers School, Winsford Avenue, Allesley, Coventry. The general meetings are held monthly, on the second Tuesday, at 7.45 p.m. All visitors are welcome. At the A.G.M. held in January, the following officials were elected: chairman, T. Emms; treasurer, Sue Bartlett; secretary, A. Simmons, 27 Shilton Lane, Bulkington, Nuneaton, Warks. CV12 9JL; show secretary, R. Clewes; social secretary and P.R.O., R. Bartlett; Newsletter editor, R. Cleaver; committee members, R. Rice and C. Bates; Librarians, D. Jones and Jeanette Bates.

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AT the annual general meeting of **Southampton A.S.** the following officers were elected: chairman, A. Weaire; secretary, D. Mills, 30 Ferndene Way, Bitterne Park, Southampton SO2 4SZ; treasurer, Babs Smith; committee, G. Smith, D. Lewis, J. Percy and P. Brent. Prospective members are very welcome at monthly meetings, 1st Thursday of each month, at "Robin Hood," South East Road, Sholing.

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CHANGE OF NAME

The Trowbridge and District Aquarists Society have dropped Pondkeepers from their title.

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CALENDAR

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 Forder 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.

10th March: The British Aquarists' Study Society. First Spring Meeting at 2 p.m. at the Meeting Rooms of the Zoological Society of London, Regents Park, N.W.1. Killies—an afternoon of practical killie keeping with Ian Sainthouse and other speakers. To be followed by a visit behind the scenes at the London Zoo Aquarium by kind permission of the Curator, Dr. H. Gwynne Vevers. Tickets £1·25 members, £1·50 non-members, from Mr. W. E. Goodwin, 14 Dawlish Drive, Devon Park, Bedford.

17th March: Riverside Aquarium Society Open Show at St. Etheldreda's Church Hall, Gloucester Street, Fulham Palace Road, SW6. Schedules, phone 0240322786 or 385 0276, or write W. Nethersell, 13, Greyhound Road, Fulham W6N 8H.

31st March: Croydon A.S. open show. Schedules from Mr. Trevor Skeet, 64 Sumner Road, West Croydon (tel: 01-681 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).

1st April: Scunthorpe Museum Society Aquarist Group 9th open show at Charter Hall, Corporation Road, Scunthorpe. Schedules available from Mr. D. Caldow, 5 St. Martins Road, Scawby, Brigg, South Humberside DN20 9BG.

7th April: Catfish Association of Great Britain Open Show, Raynes Park Methodist Hall, Worple Road, Raynes Park SW 20. Schedules from Show Secretary, Mr. T. Cruickshank, 82, Stanley Avenue, Greenford, Middlesex, phone 01 578 0104.

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).

8th April: Kettering A.S. open show at McKinley Theatre. Schedules available from D. McAllister, 105a Welland Vale Road, Corby, Northants.

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.

16th April (Easter Monday): **Southampton A.S.** Open Show at The Avenue Hall, The Avenue, Southampton. Schedules from Don Mills 30, Ferndene Way, Bitterne Park, Southampton.

22nd April: York and District A.S. Open Show at the Livestock Centre, Murton, York. Benching 12 noon to 2 p.m. Details from Show Secretary Mrs H. Welsh, 1 Enfield Crescent Holgate Road, York.

28th April: Southend, Leigh and District A.S. open show at St Clements Hall, Leigh-on-Sea, Essex. Details from Open Show Secretary, Ray Stanford, 1 Hilary Close, Rochford, Essex. (Tel: Southend (0702) 546090).

28th April: Bristol Tropical Fish Club annual open show of tropical fish, will be held at the United Reformed Church, Whitefield Memorial Hall, Muller Road, Horfield, Bristol, to F.B.A.S. rules. A Trophy class has been applied for. Show Secretary, Mr. T. A. Coggins, 36 Leighton Road, Southville, Bristol BS3 1NT (tel: 631307) from whom copies of schedule will be available on request and accompanied by s.a.e. Postal entries will be accepted up to Thursday, 26th April.

29th April: Half Moon A.S. open show' Corporation Hall, West Row, Stockton-Cleveland. Schedules from C. W. Buck, 22 Danby Grove, Thornaby, Cleveland, TS17 8BX. Tel: Stockton 65284.

29th April: Corby A.D.A.S. Open Show, Corby Civic Centre. F.B.A.S. rules. Schedules from C. MacAllister, 18 Maidford Road, Corby, early March.

6th May: Bournemouth A.S. annual open show at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Schedules available later from J. V. Jeffery, 30 Braemar Avenue, Southbourne, Bournemouth, Dorset, BH6 4JF.

12th May: Tonbridge and District A.S. fish exhibition at Lambeth Walk, High Street, Tonbridge.

12th May: Port Talbot A.S. open show at the Talbach County Youth Centre, Margam Road, Port Talbot, West Glam. Trophies, plaques, cards for all classes. Schedules early March from Show Secretary, A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, West Glam. SA13 1AZ. (Tel: 3752).

13th May: Goole and District A.S. open show at the Shire Hall, Howden, Nr. Goole.

13th May: The British Koi Keepers' Society National A.G.M. will this year be held at the Botanical Gardens, Edgbaston, Birmingham, at 1 p.m. Membership details apply: Mr. M. Walmsley, 165, Woodside Road, Amersham, Bucks, HP66NR.

19th May: Trowbridge & District A.S. Open Show at St. Thomas Church, Timbrell Street, Trowbridge, Wilts. Schedules will be available from Mr. J. Bennett, Show Secretary, 30 Lewis Cresent, Frome, Somerset.

20th May: Caer Urfa A.S. 1st annual open show at the Chester Ede Community Centre, Benton Road, Biddick Hall Estate, South Shields. Fish auction and entertainments. Schedules later from the Show Secretary.

20th May: Gloucester Aquarist Society Open Show to be held at Chequers Bridge Centre, Painswick Road, Gloucester. 31 classes to F.B.A.S. ruling. Trophies for 1st and 2nd plus award cards. Dr D. M. Ford of 'Aquarian' will give a slide talk on Aquaria around the World during judging. Schedules from March, from Mr S. Grainger, 2/10 Bazeley Road, Matson, Gloucester.

20th May: The British Aquarists' Study Society, Second Spring Meeting at 2 p.m. at the Meeting Rooms of the Zoological Society of London, Regents Park, N.W.1. The Barbs—Dr. Keith Banister of the British Museum Natural History and other speakers. Tickets, £1·25 members and £1·50 non-members, from W. E. Goodwin, 14 Dawlish Drive, Devon Park, Bedford.

27th May: Merseyside A.S. annual open table show at the Rainhill Village Hall, Rainhill, Lancs.

May: Trowbridge and District A.S. open show. Date to be announced later.

16th June: South Park A. (Study) S. SPASS open show at the Community Centre, St. George's Road, Wimbledon, S.W.19. Will all holding cups please return these by Thursday, 15th May, to the Show Secretary, Mr. L. Clapp, 16 Overhill Way, Beckenham, Kent. (Tel: 01-657 4404, daytime).

17th June: Loyne Aquarists open show, St. Paul's Parish Hall, Scotforth, Lancaster. Details from Mrs. H. Batchelor, 76 Greaves Road, Lancaster (Tel: 66633).