

# The AQUARIST AND PONDKEEPER

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## Contents

	Page
Editorial .. .. .	221
Fishy Fingers .. .. .	222
The Garden Pond in February .. .. .	223
Coldwater Fishkeeping Queries .. .. .	224
A Community of Characins .. .. .	225
Aquaria with that "Established" Look .. .. .	226
Friends & Foes .. .. .	227
Breeding the Zebra Fish .. .. .	228
Microscopy for the Aquarist—46 .. .. .	229
The Rebirth of Plymouth Aquarium .. .. .	230
Aquarist's Notebook .. .. .	231
Jewel Fish, Red Cichlid or Red Chromide .. .. .	233
On with the Show .. .. .	234
Maintaining Small Aquaria .. .. .	235
The Smaller Skinks are Easy to Keep .. .. .	236
Our Readers Write .. .. .	238
News from Aquarists' Societies .. .. .	240

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## Editorial

IN the article entitled "Fishy Fingers" in this issue, the notion is discussed that there is a class of aquarists who, like the allegedly "green-fingered" group of gardeners, can make everything they touch spring into life and blooming health. Probably few aquarists really believe that such a magical quality exists in any of their fellows, but a much greater number appear to think that there is some secret recipe by which they could, if only they held the formula, at a moment's notice induce one particular species of fish or another to spawn for them.

This idea presumably arises from the tyro's impression of the experienced breeder, who seems to be able to forecast spawnings of fishes in which he specializes and who always appears quite confident that all will turn out well. All that this means, of course, is that from long and careful observation of his fishes he has come to know their habits and requirements and the signs to look for. His technique has been developed to provide the right conditions at the right time, not just any old time. He has, in fact, learned in what is commonly referred to as "the hard way," and there probably is no substitute for it.

IT is good news that the work of modernising the Plymouth Aquarium, which is the subject of an article on page 230, is progressing so well that the Aquarium will be open again to visitors this summer. The many aquarists familiar with the old Aquarium will be looking forward to seeing it in its new attire.

There is a possibility that another public aquarium will be opening in Devon this year, for last month the Exmouth council agreed in principle to an idea for an aquarium on the esplanade. The group offering to set up the aquarium is believed to be Aquaria Research Ltd., promoters of a public aquarium at Torquay.

## Fishy Fingers

by N. E. PERKINS

THOSE aquarists who appear to have a margin of success above the average frequently have the term "fishy fingers" applied to them, but is it true or is there some simple explanation which fully explains their constant lead over others who may be just as keen? Personally, I incline to the latter view, for all that I observe in people possessing this apparent gift points unmistakably to one salient fact which separates them from others.

I think it was Carlisle who referred to genius as "the capacity for taking pains," but this is of little use unless based upon reasonable assumptions. I would suggest that the successful fishkeepers have the metaphorical capacity for putting themselves in their fishes' place, at the same time recognising the different needs of the creatures caused by environment and structure and attempting by observation and experiment, to supply these in a correct manner.

The constant use of toxic chemicals in the search for cures of disease is, I feel, a great mistake made by most aquarists and strongly advocated by many reputedly learned people. My own view of this is that under natural conditions a fish is a very healthy specimen although he may well carry his quota of parasites. He does not fall a prey to fungoid, bacterial or sporozoan disease unless and until the area of water in which he lives becomes fouled and vitiated or he suffers some physical injury. Even in this latter case, though death may ensue after the inroad of disease at the damaged area, such disease does not spread to all other fish in the vicinity, largely because, of course, the far greater area of water involved.

I once had a most interesting conversation with a veterinary surgeon who, though he had not the slightest interest in fishes, undertook an experiment to satisfy his opinion that their diseases were caused, in the main, by a fall in their resistance. He housed six medium-sized goldfish in a large well-planted aquarium, easily capable of holding a dozen such fish, and fed them on liver, shrimp and other nutritious foods until he was satisfied that they were in sparkling condition. He then procured another half dozen very diseased specimens and placed these with the others, continuing to feed the whole community on his special diet. The result of this experiment was that none of the first six contracted the disease (he referred to this as fungus but since he was not well acquainted with fish they may have had other complaints as well). Of the sick fish three died and the remainder fully recovered and eventually reached the same peak of healthy perfection as the others. That this would not be successful with some complaints, to wit, white spot (because of the nature of the parasite's life cycle and the confined nature of the experiment), in no way detracts from its value.

It follows from this that the diseases of captive fishes stem largely from the restricted space and poor conditions under which we keep them, and the introduction of such contagious types as white spot may well be caused by failure to apply quarantine methods to new stock. The repeated use of drugs and chemicals as each epidemic arises serves but to weaken the fishes whilst failing to prevent the next onset which, in its turn, will gain a firm hold upon the creatures because of their weakened condition. Let no one suppose that in the keeping of fishes it is possible by sterilisa-



Photos: Laurence E. Perkins

*Improvement in water condition can best be achieved by arranging a fall of water from one pond to a lower one. Constant circulation is obtained by use of a pump.*

tion and the use of drugs entirely to prevent disease, for the causes of introduction to our tanks are so numerous and varied that total success borders upon the impossible. What we can and should do is to arrange that no fish is required to live in congested conditions, and although this may mean keeping fewer fishes surely this is preferable to the alternative.

That many people fail to recognise the true nature of problems in fish-keeping is revealed by the type of question they ask, for example: I have frequently been asked by pond-owners to give an opinion on the value of mechanical aeration for ornamental pools, and though usually the reason behind the query lay in unsatisfactory conditions caused by overcrowding the fishes or failure to keep the pool in a reasonable condition, there have been occasions when it was asked merely because the owner thought that some magical improvement might thereby be obtained. All this, of course, refers to the method of pumping air through a porous stone so that diffused bubbles rise to the surface in a steady stream, and it would appear that many people are of the misguided opinion that these small bubbles directly increase the proportion of the dissolved oxygen in the water to a considerable extent. This is by no means the case, the value of this type of aeration lying in the fact that currents are set up which continually change the water in contact with the atmosphere and allow gaseous exchange to take place at a faster rate. Should an aquarium in which this type of apparatus is employed have its surface almost completely covered by floating plants, then its value is reduced practically to nil.

It is only at the surface of water that replenishment of the oxygen content normally takes place, and it is for this reason that a very rough guide of 24 square inches of surface area is reckoned to be necessary to support 1 in. of fish (i.e., 1 sq. ft. for a 6 in. specimen). From this it will be seen that in a normal pond, containing the usual lily, the effect of such aeration would be very small indeed, and even if the number of diffusing stones was increased the general effect would be one of disturbing small particles of detritus rather than of oxygenating the water.

Suppose we examine the cause of the query in the first instance. If it be that the fish show signs of distress at times—usually the early morning—then the cause may be one of three things, namely: 1, too many fish; 2, foul condi-

tions caused by overfeeding with dry food or failure to clean the pond out at 3-yearly intervals; 3, too many aquatic plants (which have reduced the surface area for one thing and which yield carbon dioxide during the night when the absence of sunlight stops the process of photosynthesis and its production of oxygen). Now, none of these causes can be rectified by artificial aeration; indeed, with foul water the trouble may be accentuated by its use. If the pool is in reasonable condition and trouble-free, then why the desire for aeration? Usually, I imagine, it is the desire for greater clarity of the water, and here it must be clearly understood that aeration of this type will not give it—quite the reverse in fact, especially during the early part of the year when pond water tends to become very green.

The best way to achieve not only efficient aeration but also greater clarity is to circulate the water by means of a pump and a small pond or concealed container above the pond level; many picturesque effects are then possible, such as miniature waterfalls, rivulets, etc. To obtain the best effect it is wise to allow the major pond to overflow over a weir and into a smaller compartment from which the water would be pumped. By this means the surface of the main pond will be kept free from dirt and film, thereby enhancing its appearance and increasing its ability to absorb oxygen. No great expenditure of electricity is required for this, since the pump can be quite a small one; furthermore, it would be unnecessary to have it in action all the time, a few hours a day being ample to give the desired result. Even with this method the seasonal green-ness would still cloud the pond for a time and the water, even after this had cleared, would lack that crystal quality of mountain streams which is so attractive.

Fish-keeping is no different from any other human

activity in that success in any direction merely reveals problems of greater magnitude awaiting solution, and although continued solution of problems may be amusing and instructive, the infinite and eternal nature of possible knowledge makes any solution of little value save as a stepping stone to further solutions and so on *ad infinitum*.

I would therefore advise any aquarist or pondkeeper to concentrate more on the beauty and pleasure which his hobby can give to himself and others than on becoming too involved with the quest for scientific data, whilst not forgetting, of course, that his pets are entitled to the best he can provide and this requires at least sufficient knowledge to enable him to supply them with as near natural conditions as is possible.

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## The Garden Pond in February—by ASTILBES

**I**F the pond has been frozen over for some time and a sudden thaw comes this month the water is likely to be anything but sweet. This is especially so if snow has been allowed to lie on the top of thick ice for days on end. The water will then take on a brownish hue and the fishes will not be happy. Much of the water should then be changed or the fishes may suffer. Any fishes prone to swim-bladder trouble are almost sure to show symptoms at this time of the year, and if any are found lying on the bottom on their sides or even floating upside down near the top of the water, they require treatment. About all that can be done is to place the fish in slightly warmer water. There is no need to make this water very much warmer than the pond; about six or eight degrees warmer will suffice. The fish should not be returned to the pond whilst the weather is still severe.

During very severe weather it is a good plan to cover tender water-side plants with some bracken or straw. The former is to be preferred if it can be obtained as the straw always makes the garden look untidy, much more so than would the bracken. Some of the primulas suffer if they are subjected to too much hard frost and so they can be covered with protective material to advantage. Do not be tempted to divide or transplant any pond-side plants at this time of the year. They are better left well alone until the warmer weather.

If an electric pump is installed for a fountain or waterfall, see that it is examined and carefully greased against rust. See that all contacts are well cleaned and a slight smear with petroleum jelly will help to prevent rust or corrosion. There is no need to feed any of the fishes during this month as a rule, but if a mild spell is encountered towards the end of the month there is no harm done by offering a few small pieces of earthworm. If the fishes show no interest in this food give no more, and in any case do not be tempted to give a lot of food as yet.

The prospective breeder will be able to look over his stock and if short of any kinds can now try to obtain new ones, but do not leave this too late as the best may have been disposed of. If new fishes are purchased see that they are properly acclimatised before putting them into the pond. If they have come from another outdoor pond, they should be all right, but if they happen to have been newly imported they may have been warm-water bred and so they must not be placed straight into the pond. It will be necessary to accustom the fishes gradually to a lower water temperature before risking them in an open pond.



Bubbles of air rising from an aerator diffusing stone serve mainly to agitate the water surface rather than to supply extra oxygen directly to the water

## COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I have lost some fish which I entered for a show and understand that the water for filling the tanks came from copper pipes. The pipes had not been used for some time and so the water could have been in contact with the copper over a considerable period. Have I any claim on the organisers of the show for the loss of my fish? I contend that more care should have been taken to make sure that the water was pure.

I do not know what the rules and regulations were which governed the show. It is usual to include some form of regulation such as "The organisers will take reasonable care of exhibitor's property but cannot accept responsibility for loss or damage." Then they may add another "get-out" with "The organisers' decisions shall be binding on all matters whether or not covered by these regulations." If your schedule had such regulations or similar ones you would not be able to make any claim on them. Whether the owners of the hall could be sued for neglect in any way would be questionable.

Poisoning with copper keeps cropping up and I remember that some years ago when I suggested that copper pipes had been the cause of the death of a number of fish, some people wrote to say that they did not think that my surmise was correct. Since that time I have had many instances of fishes being killed when water was drawn through copper pipes. I no longer have any doubt whatsoever in my own mind that copper can be dangerous. Naturally if a large quantity of water is drawn off before taking water for a tank the risk is lessened, and I am sure that more danger would arise from new pipes than from old ones. Also if the water was of a hard nature it could cause a deposit of lime to form on the inside of the pipes which would render them far safer than if the water was soft.

I recently had an experience of copper. I have 13 cold-water cisterns in my garden in which I had about 200 of last year's fantails. All tanks appeared in about the same condition and the fish were all fed on the same foods. One day I noticed two dead fish in one of the tanks. Now fish do not die for nothing, and I was greatly puzzled about the cause. The dead fish showed no outward signs of injury or damage and I could only think that they had died from lack of oxygen or excess of foul gas. I smelt the water and it did not seem good enough for my liking. I therefore decided to empty the tank immediately to save any more losses from that tank. I lifted out a quantity of hornwort and before netting up the young fish I felt round in the water for more weed. Suddenly my hand came into contact with something strange, and I found that it was a small coil of copper wire. How it had got there I do not know; it may have been thrown over my fence. What was I to think under these circumstances? Here were a number of tanks in equal conditions and in the only tank where there had been any trouble I find copper. Some might think that there was no connection between the copper and the dead fish; I prefer to stick to my own conclusions that copper can be fatal to goldfish even when in small quantities. The tank in question was a 60-gallons one but it has been filled up with concrete, etc., to give not more than 9 in. of water depth. I feel certain that the copper wire was the cause of the death of my fish and since the tank was thoroughly cleaned out and refilled there has been no sign of trouble with the fish which were in the tank before.

I have a tank 21 in. by 12 in. by 10 in. deep. I let it get in a bad condition some time ago and now the fish have become ill; one or two had tail rot. I have lost one or two of them and have now changed the water. What was the cause of the trouble and could it have been a disease introduced with dried shrimp food?

I do not think for one moment that the disease could have been introduced by the dried shrimp. This could have caused the water to become foul, but no more than would any other dried food given in excess. The fact was that when you neglected the tank for a time the water fouled

and the fish went off condition. Once this happened the mucous covering of the fish is unable to protect the fish from outside germs, etc. The causes of fungus (and tail rot is a form of this) are always present and, like the germs of the common cold for humans, waiting to attack when resistance is lowered. It is quite easy to keep a tank in good condition but once it is neglected and gets foul it is very difficult to get in order again and may need a thorough cleaning and setting up afresh before things get back to normal. When any type of dried food is given it is most important to make sure that too much dust is not given at each feed. The fish will always eat the large particles and will clear up the fine only when they remain hungry.

I have a fairly large outdoor pool with a number of fishes therein (goldfish, orfe, shubunkins and green tetra). I make up a mixture of food with *Daphnia* and several kinds of packet foods. The fishes do not seem to take worms or dried flies which I bought for them. Shall I leave well alone as they seem healthy?

As long as the fishes are healthy there is no need to change the food. They may be getting some forms of live food in the pond in the form of larvae of insects. It is strange to hear that your fishes will not eat garden worms. I consider that these are the finest form of food for the fishes you keep. I have heard of this apparent dislike of worms from other sources. My own fishes take worms better than any other food. I think that it must be that your fishes have not been properly "educated" into the habit. If fairly large worms are given to fishes for the first time, they can be frightened by the wriggling of the worms and may not take them at all. If the worms had been broken or cut up into small pieces and given to the fishes when they were hungry I cannot help thinking that they would have eaten them all right. The next time you feed your fishes drop in some small pieces of worm, and I shall be surprised if these pieces are not eaten, provided, of course, that you have not given a lot of other food first. The fishes can be healthy on dried foods but I am sure that a little live food now and again is beneficial.

I have a cold tank with two 25-watt electric lamps overhead. Is this enough and how long must I keep them on each day?

If your tank is 24 in. long the lamps should be enough. A lot depends on how much natural light reaches the tank. You will have to experiment and see how the plants thrive. I do not think that the fishes will worry at all about the amount of light but the plants will soon fail if they get insufficient. The duller the day the longer will the lights have to be on and vice versa.

I have recently completed building a pond in my garden, 10 ft. by 8 ft. by 2 ft. What plants do I need, when should I start planting and what fishes would be suitable to stock it with?

I feel sure that the best thing you can do is to get my book *Coldwater Fishkeeping*, price 2s. 8d. post free from *The Aquarist*. This deals fully with ponds, with special reference to starting with plants, fishes, etc. When you have read this book I shall be glad to answer any query not explained in it.

I have a pond in which some of the goldfish are dying. The water has turned a blackish lifeless colour. Could this be due to the decaying of many water lily leaves?

Yes, your surmise is correct. The decaying of a number of water lily leaves will pollute the water of a pond very quickly indeed. You will also possibly find that oily substance will form on the surface of the water. You must empty the pond, clear out as much as possible of the muck and decaying vegetation and refill with fresh water. The pond should then be much safer.

# A Community of Characins

by JOHN S. VINDEN

**M**OST aquarists keep at least one community tank, and many aquarists keep several in different parts of the house, but strangely enough very few fishkeepers maintain tanks confined to either one family of fishes, or fishes that are associated together in the natural state.

Both these types of community aquarium have much to recommend them. Conditions which suit one member of a family will, in all probability, suit most of the others, and fishes that share a natural habitat certainly thrive under the conditions offered by that habitat. The usual community tank houses fishes such as danios, from swift fresh streams, living cheek by jowl with, say, some of the anabantids, which are often found in sluggish backwaters full of decayed vegetation.

Although both these types of fishes may flourish in the community tank, their natural homes differ to such an extent that one feels that possibly they are only making the best of a bad situation!

## A Characin Community

The smaller characins are ideal for a community that is limited to one natural family of fishes, for most of them are gentle, many have bizarre shapes and the family contains some of the most highly coloured aquarium fishes yet discovered.

Since most of the aquarium characins feed either at the surface, or in mid-water, they do not churn up the bottom of the tank so that with the minimum of attention the water in a characin tank will remain bright and clear for a considerable time.

The Characinae is a large family of fishes from Central and South America, and Africa. Not all of them are suitable for the small tank, for the family includes such fishes as the notorious piranha and other large species of doubtful aquarium value. Many of the African characins are of extreme beauty, and well merit tanks of their own, but most of them become too large for the community of small fishes and, at the moment, not enough of them are readily available for them to be really well known. New species, however, are frequently arriving, and will become popular fishes when well established.

Most of the smaller American characins are easy to keep under normal aquarium conditions provided that certain basic facts are kept in mind. They do not like new water, and although fairly tolerant to differing pH values they prefer water on the acid side and, if breeding is attempted, old acid water appears to be essential.

Most of the species will eat the better-quality dried foods that contain plenty of animal matter, but to keep them in full health the dried food must be supplemented with any live food that is small enough for the fishes to eat. *Daphnia*, brine shrimps and white worms are taken greedily, and without such foods a substitute must be found in the form of finely chopped earthworm, scraped beef or white fish. Fine-leaved aquarium plants are nibbled by some species.

## Plants Suited to the Community

Planting of the tank is a matter of taste, but since the fishes proposed for this tank all come from America the aquarist may wish to furnish the tank with plants from the same geographical area. The first plants which come to mind are those of the genus *Echinodorus*. The Amazon sword plant (*E. paniculatus*) and the chain sword (*E.*



Photos:

Laurence E. Perkins

Rosy tetra (*Hyphessobrycon rosaceus*)

*intermedius*) are well known, but there are many other desirable species on the market including the cellophan plant (*E. rostratus*), the ruffled sword (*E. martii*) and the so-called dwarf sagittaria (*E. tenellus*). Other American plants include *Cabomba*, hairgrass (*Eleocharis acicularis*), *Elodea callitrichoides*, *Heteranthes*, *Ludwigia mullertii*, some species of *Myriophyllum* and *Sagittaria*, and *Vallisneria*. A well-planted tank can be set up that is geographically in accord with the fishes that will live in it.

Many of the characins are too common to warrant description, for there can scarcely be an aquarist who is not familiar with such fishes as the flame, X-ray, beacon and neon tetra. Common though these may be, however, they have held their own for many years on their own merits and are worthy of a place with their less-common relatives, for if kept away from boisterous fishes such as barbs, they will settle down and display far better colour. The black widow, particularly when young, makes an admirable foil



Lemon tetra (*Hyphessobrycon pulchripinnis*)

to other, more brightly coloured, species and should not be excluded from the collection for its sombre colour.

#### Characins Old and New

Amongst the more spectacular tetras are the rosy tetra (*Hyphessobrycon rosaceus*) and the red tetra (*H. serpa*). Other attractive old favourites are the Belgian flag tetra (*H. heterorhabdus*), the glowlight (*Hemigrammus gracilis*) and the handsome lemon tetra (*Hyphessobrycon pulchripinnis*).

All the fishes so far mentioned have been seen in aquaria for many years, but during the last 2 years many newcomers have appeared upon the scene, and some of these outshine many of the old favourites for sheer beauty. Pride of place must go to the cardinal tetra (*Cheirodon axelrodi*), which is the outstanding post-war introduction. This fish achieves the apparently impossible, for it excels the neon for brightness, colour and size. It seems unlikely that we shall ever see a more brilliant aquarium fish. A fish that is offered as *Hemigrammus ocellifer ocellifer* resembles a beacon, but has an extra coloured "eye." *Hyphessobrycon*

*greimi*, although having a superficial resemblance to the flame fish, has a distinctive red caudal fin and a black-and-gold spot on either side. Other newcomers of beauty are *Hyphessobrycon* species *costello* and the bleeding-heart tetra *H. rubrostigma*.

Two entirely new small characins have recently been imported. These are *Hyphessobrycon callistus bentoni* and an unidentified *Hemigrammus*. The former resembles *H. serpa minor* but has no sign of a shoulder spot and is of a more intense scarlet. The last-named fish is a silvery green species with a greenish lateral line and a brilliantly coloured tail which is barred horizontally with bright orange, yellow and black stripes. The dorsal is tipped with white.

This article has touched only the fringes of the characin family, for this group include the hatchet fishes, the pencil fishes and very many other interesting species including the fascinating blind cave fish from Mexico (*Anoptichthys jordani*), which can be included in the community tank when small, where apart from being an interesting fish it will do a certain amount of scavenging.

## AQUARIUM PLANTS FOR THE CONNOISSEUR

# Aquaria with that "Established" Look

by W. L. MANDEVILLE

ONE of the most difficult features to simulate in the tanks for temporary display is that subtle difference between plants looking as if they had grown there and plant life which obviously appears to have been carefully arranged in the tank. This latter appearance often springs from the use of mature plants in groups, graded by size for effect, but with little attempt to show immature plants growing from the parent stock, which alone can give an impression of flourishing plant life.

Plants such as *Cryptocoryne* seem to have a steady growth rate which results in uniformity of size. This uniformity is often concealed by associating plants of differing species together to fill in the gaps, which results in quite pleasing pictorial effects except for the fact that the plants seem to have stopped growing when the picture was completed. The difficulty in overcoming this lies in finding aquatic plants, with a sufficiently strong root-stock carrying offshoots, that can be planted as a complete whole, and it is here that the *Lagenandra* prove most useful.

#### Species of *Lagenandra*

*Lagenandra*. (Origin: Coastal areas of Ceylon.) Springing from a creeping root-stock, the leaves of all species of *Lagenandra* emerge from sheaths carried on strong stems. The sheaths are ultimately discarded and the general appearance of the leaf is as if the stem had unfolded to form a blade-shaped leaf. The decorative value of *Lagenandra* is twofold. Firstly, the continuous production of leaves at points along the creeping root-stock results in mature leaves of full size, being surrounded by leaves in different stages of development, giving an appearance of "well-doing" that is almost impossible to stage. The second advantage is that rare thing among aquatic plants—a variegated leaf—carried by at least one *Lagenandra*. This variegation is not a colour effect caused by light, or effected by conditions of culture, but a silver-edged variegation which appears as the leaves mature; as the submerged leaves of all *Lagenandra* persist for months at a time, the attractive effect of this variegation becomes increasingly pronounced, especially when it is emphasised by the dark-green immature foliage with which it is surrounded.



Illustration supplied by Shirley Aquatics Ltd.

Left, *Lagenandra lanceifolia*; right, *Lagenandra orata*

When established, the plants are very accommodating, persisting in almost any quality of light, with some preference for poorly lighted situations; they continue to flourish in waters of varying density, even brackish water causes them no concern, and any aquarist contemplating the care of fishes with a preference for brackish water would do well to include *Lagenandra* in the decor of his tank.

*Lagenandra lanceifolia*. The mature leaves of this attractive plant have their dark-green centres emphasised by a broad band of silver variegation around the edges. Carried on strong reddish brown stems about 6 in. long, the 10 in. lanceolate leaves, with their silver variegation brought into sharp relief by the dark green of growing immature foliage, presents a picture of aquatic vegetation that few other plants can give.

There can be some confusion with an immature *L. lanceifolia* and *Cryptocoryne beckettii*, but not if the root-stock of each is known and examined, and if the leaf-formation of each is studied. The broad-based leaves of *C. beckettii* are distinct from the stems which carry them, whereas at all stages of growth the leaves of *Lagenandra* appear as if the stem had unravelled to form them.

*Lagenandra orata*. A plant similar in size and conformation to *L. lanceifolia*, but without the variegation. Leaves are of a much lighter green than *L. lanceifolia* but have an attractive wavy edge and are carried on strong dark-green stems. This plant has a resemblance to *Cryptocoryne ciliata*, except for the wavy edge to the leaves, and the difference at the base of the leaves. The leaves of *C. ciliata* are broad-based whereas the leaves of *L. orata* taper towards the junction of leaf and stem.

#### General Notes and Cultivation

There is no seasonal decline in *Lagenandra*, but an almost continuous succession of new leaf growth, each leaf springing from the creeping root-stock. This enables propagation by root-division to be carried on without disturbance of the parent plant; it also enables the plant to be displayed entire, with immature leaves and plantlets occupying the lower waters of the tank, surmounted by the bolder form and coloration of the mature leaves.

Seeds from the bisexual flowers are borne above the water, and should be caught in floating trays or a suspended net and cultivated under bog conditions. Although the *Lagenandra* have a fair temperature tolerance, the bog media for cultivation must be within the temperature range of 60-70° F. if propagation from seed is desired, and the ambient temperature for the raising of the seedlings should be several degrees above this. Even with divisions from the root-stock, propagation is possible only when the rooting medium in the tank is within this range of temperatures. Tanks with the heating device placed above the compost, and with a low ambient temperature, will carry *Lagenandra* well, but such conditions are not ideal for cultivation.

Mention has been made of the resemblance, at certain stages of growth, of *L. lanceifolia* to *Cryptocoryne beckettii*, and of *L. orata* to *Cryptocoryne ciliata*. There is sufficient confusion already among the nomenclature of *Cryptocoryne* and steps have already been taken in Britain to clarify this confusion.

#### Water Wistaria

Because water wistaria (*Synnumma triflorum*) cannot be confused with any other aquatic plant it is dealt with here as an example of possible "plant manipulation," which is so necessary if plants are to be fashioned to fit the decor of any particular tank. The popular name "water wistaria" was given to this plant when Shirley Aquatics Ltd. introduced it in 1954, because, under certain conditions of growth, the leaves bear a remarkable resemblance to the leaves of the terrestrial wistarias, but from the base of the plant to its apex there is such a diversity of leaf structure—from a comparatively simple leaf to a very complex form—that

one would hesitate to describe the plant by leaf-shape.

When grown in good light, fully developed leaves of a pale-green colour are carried on auxiliary stems from the main stem and, at maturity, adventitious roots appear below the juncture of the stems; this enables divisions to be made easily, and some divisions must be made if good specimens of *S. triflorum* are required, for there is a gradual loss of virility in the main stock which leads to eventual disintegration. Alternatively, the stems can be layered, with the adventitious roots pegged into the compost; the plant will then grow into an effective screen formation which will enhance associated plant life of different coloration, or soften the rock line at the sides of a tank.

To "model" this plant to a desired shape, frequent pinching out of the leading shoots is necessary, but it must be remembered that this attention must be frequent.

(Please turn to page 230)

## FRIENDS & FOES No. 74

### The Valve Snails



Left to right: *Valvata cristata*, *V. piscinalis* and *V. macrostoma*

#### Mollusca GENUS: *Valvata*

THERE are only three species of valve snails to be found in Britain, each easily distinguished from the others by the shape of the shell, which in this genus at any rate is a safe guide. *Valvata cristata* (crested) may at first glance be mistaken for a baby *Planorbis*. An adult will not exceed three-sixteenths of an inch in shell diameter, and considerably less than this in thickness. Closer examination reveals an operculum, and if the creature inside the shell is examined marked differences from a *Planorbis* are apparent.

The differences are better seen if the snail is allowed to feel at home in water, so that it opens up and cruises about in the container. With a hand lens it can be seen that its gills are protruding from the shell on either side of its head, and that the two are different in shape. That on the left of the head is feather-like, to the right the gill is thread-like. The front part of the head is prolonged into a pronounced snout and the front part of the foot divided into two triangular portions. It is found in thick submerged vegetation, but really needs looking for, its size helping it to elude capture.

*V. piscinalis* is about twice the size of *V. cristata* and more like a pea—pea-sized, one might say. Between the two, in both size and shell shape, is the third species: *V. macrostoma* (big mouth). All three species prefer moving water, and are not found in stagnant pools. All are small and of tit-bit size for those fishes able to crush their shells. All lay eggs in flat gelatinous capsules attached to plants.

With their siphon-like mouths it is unlikely that they eat tissues of plants. More likely they concentrate on algae on plants and stones or on the mud bottom of their habitat, but of this I have no real evidence.

C. E. C. Cole

# Breeding the Zebra Fish (*Brachydanio rerio*)

by E. WALLWORK

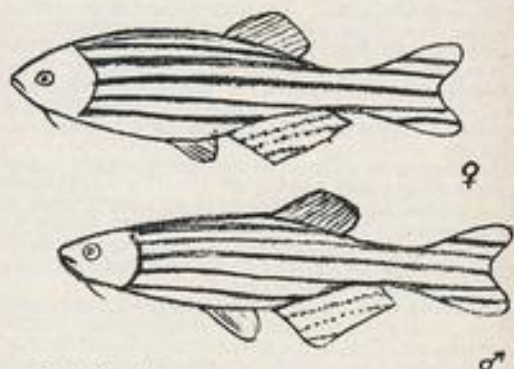
**T**HIS attractive and lively little fish needs no introduction to most aquarists and has retained a permanent place in the tropical community tank. It has all the good points that we look for in our fishes and although the books say that it is easy to breed, my attempts were most disappointing for 3 or 4 years—about a dozen fish reached maturity after repeated attempts. Since then I have had good results.

The main requisite is to provide a free swimming area for the fish to drive and at the same time to trap the eggs in such a way as to overcome the strong tendency of the breeding fish to eat their own eggs as they fall through the water.

Having purchased half-a-dozen fish from a reliable source, I fed them on a variety of good foods, having regard to the fact that zebra fish have very small mouths. Food was therefore offered in very small sizes. More important, perhaps, was that small, though frequent feeds were given until the fishes were about 1½ in. long, when their sexes became apparent.

I had read that the sexes could best be distinguished by the fact that there was a more yellowish flush on the female and particularly in the tail fin. My experience is that it is the male fish who has the yellow flush and this is most noticeable when two males are each trying to attract the same female. Although it is recommended that the sexes be separated before breeding I have found that they can be brought into breeding condition in a large community tank if attention is paid to temperature and food.

To identify the sexes positively, look at the ridge of the back, forward of the dorsal fin. In the male this runs down to the nose almost as a straight line, but in the female it is



Zebra fish outlines exaggerated to show sexual features. (Female above, male below)

a regular convex line. Of course, the female is also distended at the sides when in breeding condition.

Temperature is important with zebra fish, though not critical. Generally they are happy at 72-75° F. but this is raised to 75-77° F. in the breeding tank. At higher temperatures these little fish soon show signs of exhaustion.

Food which has been offered has included dried foods in small sizes, white worms, *Tubifex*, *Daphnia* and also small quantities of a well-known make of cat food picked out of the tin with forceps to isolate it from its vegetable content. Other items which have been used include sardine, pilchard, salmon and liver scraps from the table. It would appear that the zebra fish prefers to feed at the surface or in mid-water and, unless very hungry, does not feed from the bottom as a rule.

Water in the breeding tank is carefully siphoned from the community tank to exclude snails and their spawn. This water is allowed to cover a double layer of marbles to a depth of 3 in. At the surface of the water I use a thin layer of *Riccia* or bladderwort to reduce the effective swimming depth, and this provides a larger bulk of water to avoid hot spots and promote better thermostatic control. In this way the fish are only about 1 in. above the marbles.

Choice of tank has been responsible for my early failures. Available literature has suggested that a long tank should be used to permit of a satisfactory spawning drive, and I first used a 24 in. by 6 in. by 6 in. aquarium and introduced one breeding pair, later two and three breeding pairs, all of which spawned within 48 hours. On the three attempts with one, two or three pairs, only about a dozen fry were seen each time. Stripping the tank for cleaning I found literally hundreds of eggs covered in fungus at one end of the tank, the opposite end to that in which the fry appeared.

It occurred to me that the sperms had been deposited in another part of the tank than the eggs and that a suitable union had been prevented by the barrier effect of the marbles. So I decided on a smaller tank with one breeding pair.

This tank, 12 in. by 8 in. by 8 in. was set up, with similar conditions (water, water depth, temperature and a double layer of marbles) as before. One pair was introduced in the evening and the following morning they were driving round and round the tank at great speed. After 48 hours,



Photo:

Lawrence E. Perkins

A lively group of zebra fish, a species guaranteed to promote activity in a community aquarium



the female was considerably thinner and the fish were removed.

Observation on the tank showed no movement until the third day, when a few fry were apparent on the front glass and on the sides. At the end of the fifth day, I estimated that about 300 fry were in the tank, clinging head uppermost on marbles, heater, thermostat and on the tank glass. These fry, each about 4 millimetres long and 0.5 millimetre wide at the head end, showed prominent golden eyes. Within 48 hours they were free-swimming and they were fed on Infusoria by the drip method.

Infusoria have been cultivated in spare containers, but as I have bred these little fish at all times of the year I have found copious amounts of Infusoria not only in the main tank, but in the flower vases in use with cut flowers in the house. Dealers supply a tube of liquid fry food which is preferable to Infusoria and has given excellent results. At 2 weeks, micro worms are given and 2 weeks later fine dry

food and a variety of foods reduced by the worm shredders to a suitable size, have been given.

Growth in the small tank is usually so rapid that aeration is used after a fortnight, and a fortnight later the whole batch is transferred to a larger tank of identical water at the same temperature, and with the same depth. Over a period of the next 2 weeks, the depth is progressively raised, so much so that at the age of 8 weeks they are really colourful, active little fish.

The stripes appear to develop from the central stripe outwards, which appears relatively early and which, with their bright almost luminous eyes, give the baby fishes a most attractive appearance, especially when seen in a shoal under a bright top light.

The pH of the water (tested as a matter of interest only) has been in the region of 7.0-7.3. Light is usually diffused daylight. Temperature of water has varied a little, but averages 74-78°F.

## Microscopy for the Aquarist—46 by C. E. C. COLE

**I**N this article are details of a home-made ringing turntable which will enable you to give the professional touch to the slides you are making or hope to make.

Material required is little and can be obtained very cheaply. The "exploded" drawing shows all the parts required in the approximate position for fixing, and the other diagram shows the general appearance of the finished article. Details of the materials to be obtained are as follows.

(a) A piece of laminated wood of minimum thickness of  $\frac{1}{2}$  in. and 6 in. in length and 3 in. in width. Thicker wood is quite suitable, but thinner is likely to warp. (b) A perfect circle of laminated board  $\frac{1}{2}$  in. thick and 3 in. in diameter. Handicraft stores will prepare this for you if you are not very good at cutting circles. Get them to mark the exact centre. (c) One round wire-nail, of at least  $\frac{1}{2}$  in. diameter. The head of the nail should be cut off and the cut filed level. (d) A circle of Formica 3 in. in diameter. (e) One bearing ball of the same diameter as the shaft of the nail. (f) A pair of nuts and bolts (22 B.A.). (g) A pair of stage clips.

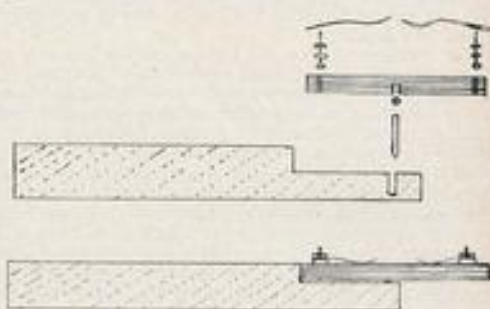
First stage is to cut the laminated board  $1\frac{1}{2}$  in. from one end to a depth equal to the depth of the circle of board plus the thickness of Formica. Once the cut is made the layers of wood can easily be removed with a sharp chisel. To avoid accidents on no account place either hand in front of the cutting edge of the chisel; the board should be held in a vice or pressed firmly against a vertical surface. I am looking at this moment at two pieces of sticking plaster covering a gash in the ball of my thumb caused through momentary neglect of the above golden rule.

Mark a point in the recess  $1\frac{1}{2}$  in. from either edge and  $\frac{1}{2}$  in. from the end.

Place the sawn-off nail on this spot and, keeping it vertical, hammer in lightly until the nail top is about  $\frac{1}{2}$  in. below the upper surface of the block. The projecting portion of the nail shaft must be vertical.

Next stick the Formica circle on top of the circle of laminated board with the recommended adhesive for this particular substance. With another nail of the same diameter as the first, and from underneath the board, make a hole the depth of the projecting portion of nail plus the diameter, or just short of it, of the bearing ball. Withdraw the nail, and push the bearing ball into the hole to the summit of it.

Place the circle on to the projecting portion of nail so that the top of the nail contacts the bearing ball. Note



In the upper drawing an "exploded" side view of the turntable is shown and below it the parts are seen assembled

how easily now the circle (the turntable) rotates on its pivot (the nail shaft). Make two holes through the turntable to take the bolts, place the stage clips on the bolts and screw on the nuts, or better use two nuts with the clip sandwiched between them, and the job is ready for use. Those who wish to improve the appearance of the improvised turntable can stain and polish the wood, but this is a refinement for the extra-fastidious, and will not in any way improve the performance of the article.

With the ringer made, how is it best to use it? The first thing, of course, is to place the slide on the turntable so that it is held in position by the stage clips. The centre of the cover slip should be above the dead centre of the turntable.

A sable-hair brush is dipped into the ringing varnish, and the hand is rested on the block so that the tip of the brush is against the edge of the cover slip. The free hand gives the turntable a push and it rotates while the varnish flows from the brush.

Do not give more than one coat of ringing varnish at a time. Cover the ringed slide with a small tin lid or similar article to prevent dust settling on the still wet varnish, and leave it for at least 24 hours before applying another ring of cement. The ultimate thickness of the seal depends entirely upon the operator. Any number of successive rings can be applied, but from the practical point of view it is necessary only for the seal to be efficient, not gigantic.

# The Rebirth of Plymouth Aquarium

by L. R. BRIGHTWELL

WHEN the famous Plymouth Aquarium became a landmark at the eastern end of the historic Hoe in 1884, it was a pioneer effort that made the slightly earlier Station Oceanographique at Naples look archaic and set the pace for all the other marine biological stations that to-day ring the oceans of the world.

It will be news therefore for all aquarists, and even the less aquarium-minded, to know that, as I write in November, 1958, the well-known tank room is only a shell; not a bomb-victim, but in the throes of rebirth. In 1956 it was felt by the Aquarium Council that the appointments of the place, though fully in line with methods approved by all other aquariums this side of the Atlantic, still left much room for improvement.

The resident naturalist, Dr. Douglas P. Wilson, therefore was sent on an extensive 6 weeks' tour of U.S.A. aquariums and returned not only with a mine of information but a number of inspirations that the U.S.A. may in its turn one day well be adopting.

Lately whilst working at the Laboratory I was, a very old member of the Marine Biological Association (and the illustrator of its very first guide book in 1924), privileged to enjoy a preview of the plans, miniature scale-model and work in progress; an illuminating insight into the Aquarium which all may enjoy in the summer of 1959.

Two features predominant in every aquarium at present standing in our islands have long dissatisfied Plymouth. Firstly one can always see that a tank is . . . a tank; i.e., four walls and a floor enclosing so much water. Rockery backgrounds, however good, never modify this impression. Secondly, aeration is invariably effected by forcibly injecting air, giving several dart-shaped bubble masses breaking the surface into concentric rings. This gives a "wobbly" effect often much spoiling one's view.

The first trouble has been overcome by an ingenious piece of tank planning which will no doubt soon be copied by all other aquariums, and might well be adopted by makers of the museum diorama, which universally spoils itself by looking precisely what it is—a toy set in an oblong box.

The jet of bubbles will be abolished, water flowing in and out of every tank by hidden inlets and outlets. Further, a set of sliding panels will make it possible to gently "sheep dog" shoals of fast-moving fishes into "catch-ups" and hidden nets, obviating present methods which too often result in much fuss and panicking, and sometimes quite disastrous removal of scales, an injury many fishes never survive.

But rebirth is not confined to the Aquarium. There is a huge common room where at tea or coffee time the four quarters of the globe meet for conversation and refreshment. A League of Nations . . . really at peace! A large new wing has been added to the great library and a wonderful ship, R.V. *Sarsia*, added to the Laboratory's research vessels. *Sarsia* boasts not only two laboratories aboard (one with aquarium tanks!), but a bath room, and an ingenious device for getting to the Aquarium alive that most delicate of beasts the squid. At best it lives in a tank only for a week or so, but is in immense demand for research.

Aboard *Sarsia*, freshly netted squid are placed in a big iron chest, fixed aft. It is filled to the brim with sea water and once the squid are in, the lid is clamped down. This removes all fear of splashing or bumping, for the slightest touch removing a fragment of delicate skin from *Loligo*



A more or less rock-and-roll proof laboratory—one of two aboard Plymouth's new Research Vessel "Sarsia"

proves fatal. This is why one never sees a squid painted or colour-photographed as in life. Really alive the squid is a uniform burning chestnut-red, the liver, shining through the semi-transparent body wall, like an oblong of molten gold.

One charming feature of the great main Laboratory remains untouched. This is the famous "Drake's Island" tank. It is really a full-size billiard table, with 18 in.-high walls built on its rim. Sea water flows through the great shallow tank so formed, and a super-pool, with an amazing assemblage of life, results.

Finally, the lighting of the Aquarium will be constant, i.e. electric, though if research demands daylight can be admitted by the windows which formerly lighted tanks along the southern aspect. One other feature is constant and that in the entrance hall, the Memorial Tablet to Dr. E. J. Allen who in 1884 was a primary founder of the Association and for more than 40 years director of an institution that is the mother lodge of oceanographical research.

## Aquaria with that "Established" Look

(continued from page 227)

Should the growth be left overlong before pinching out, it will be found that only sparse growth of leaves remains, the object being to encourage leaf formation throughout the entire plant. Although this is one of the plants requiring constant attention because of its virile growth, this constant attention is repaid.

# AQUARIST'S Notebook



by

RAYMOND YATES

WHEN the wonderful cardinal tetra first made its bow I was not one of those fanciers who rushed to obtain a specimen or two, because I thought it best to wait and see how this new wonder took to living with aquarists. From all sides it seems to have been a gift from the gods to the hobby in general, as it seems to be extremely hardy and to have no vices. I now have nine of these fish in a large tank with other varieties and I find they can quite hold their own. In no way are they scary fish, either of other bigger fishes or of their owner. If other and larger fishes come in their vicinity they merely sidestep an inch or so and then return to their original position. Movement round the tank or of the hood leaves them cold for all the notice they take. Feeding seems to present a problem in so far as the fish rarely seem to bother with food, although they grow very rapidly and are obviously in the pink of condition. They do not often dash at food in the way that neons will but are not quite so detached as angels. I fed mine with minced salmon and found that this went down very well, it being too fine for larger fishes in the tank.

Cardinals like to shoal and when they do they present a fine picture, but the mood is not always on them. On occasion they all go their separate ways, or go off in twos or threes. When they shoal they annoy you because one naturally counts them (no easy job) and if one is missing the fear of loss is always at the back of the mind. They particularly enjoy an aerator stream and clumps of plants to dodge about in. They seem to bicker with each other at times, but never so obviously as neons do, nor does any damage seem to result. To view cardinals properly the tank must be at the right height. If one looks down on these fishes they are all vivid green and nothing else. If one looks from below they are all red. Viewed end on they are invisible. The happy medium is to view them at one's own eye level for the best effect, preferably with a dark background and dull gravel. They are longer in the body than neons, show much more red and less white and, at close quarters cannot be mistaken. At a distance, viewed from above they look very neon-like, particularly when half-grown. Cardinals tend to remain fairly still in small tanks on their own; they need swimming space, other fishes and an aerator to make them flash their jewelled colours to best advantage.

My recent notes about those wives (if any) who are antagonistic to the hobby brought forth some interesting news from Mr. Arthur Albury, who is president of the Canterbury Aquarist Society. He mentions that in the early years of his married life his wife used to complain of having to put up with fishes all over the house, and pointedly suggested that if a halt was not called they would be having fishes in the bedroom next. Some 25 years ago Mrs. Albury was involved in an accident and sustained a fractured leg. Complications followed and she was in bed for months. She suffered so much pain that she was unable to read or even knit, and at this juncture she asked her husband to put a tank of fish at her bedside. At the time he was breeding shubunkins, so a tank of young fish was set up where she could see them. Mrs. Albury spent hours watching the beautifully coloured little shubunkins chasing *Daphnia* round the tank, and declares to this day that it was only through being able to watch these fish that she was able to get through those months of agony.

The chief drawback to the scheme was the fact that the doctor, when visiting, used to draw up a chair and sit watching the fish until he at length realised he was about an hour late on his round. The nurse who called to do the

dressings seemed to waste no time doing the job so that she, too, could watch the fish. Mrs. Albury has never forgotten what the hobby did for her and she became a founder member of the Canterbury club when it was formed in 1949. A year later she was made a life honorary member in recognition of her efforts to help the Society's finances. At the recent annual dinner she replied to the toast of "The Ladies." Mr. Albury closed his Canterbury tale with the remark that this can hardly be of much real help to other aquarists as he can hardly advise them to ask their wives to go out and break a leg!

Some years ago the doctor was a frequent visitor at my own home and this gentleman was quite fascinated by both bedroom and lounge tanks. In fact, towards the end, he would walk in and sit down in front of the tank and it would be several minutes before he got down to the main reason for his visit.

A fairly new addition to the tanks of hobbyists is *Barbus arulius*, which can be obtained at most of the larger dealers. This fish is quite cheap and well worth a trial. It is, of course, one of the larger barbs, but is not a very quick grower, at least I have not found it so. Like all barbs it is always on the move and is not at all shy so that its owner is always well aware of its presence in the tank. Small specimens the size of tiger barbs are ideal and they shoal with other barbs and prove very lively. Food, of course, is readily snapped up in true barb manner, and they are not choosy about what to have for a meal, although plants are not touched. I have found them quite safe with really small fishes like neons and they never bully, although they indulge in plenty of courtship. Breeding follows usual barb requirements.

Several of the larger barbs such as *B. lateristriga*, *B. everetti* and perhaps *B. filamentous* tended to lose favour as they grew older owing to lack of colour and a tendency to disturb the bottom. *Barbus arulius* does not fade; the colours seem to improve. The iridescent blues and greens, the tinges of red in the fins and the erect finnage really catch the eye. I suppose this variety can feel off-colour; I have never seen one myself which didn't glow in the peak of condition.

Another new arrival in recent months is *Rasbora borapetensis*, a charming and inexpensive fish which has made many friends. In shape this favours *Rasbora eithoveni* and has somewhat similar habits. It favours the upper strata of the water and is thoroughly at home if it can play hide and seek with a shoal of zebra danios. Feeding is not difficult, as almost anything is accepted. A lateral black band with a golden one above is the main colouring but in good top light all sorts of tints can be observed. Peaceful and hardy, this species seems to be here to stay. I do not know if it is as susceptible to white spot as most rasboras; no doubt it is. However that may be, no other troubles seem to worry it.

In a recent talk to the Nottingham club, Mr. W. L. Mandeville, the well-known Midlands aquarist and lecturer, made some good miscellaneous points which are worth passing on. Hints and tips are what every aquarist wants but few are forthcoming because they are never broadcast. A few, a very few, lecturers have specialised in these and Mr.

Mandeville is in the forefront of these. Here are some of Mr. Mandeville's points.

Take a bit of trouble and benefit: overall light hoods restrict light during the day when lamps are not on, so keep cover glasses on during the day, and remove them at night and put on the hood and switch on lights. Bulbs are often used on their sides, a position which is not normal for them; life is prolonged if fitted so that the gap in the filament comes at the top. In catching fishes from a tank conical lamp shades can be dropped over the plants, thus giving more space to work. Too many tanks are overplanted. Be wary of a plant which is not fussy about light, it is probably not fussy about work either. All algae are allergic to movement of the water. In glazing tanks make sure that the mastic goes right up to the top frame as all sorts of troubles can take refuge there when the tank is cleaned. The thickness of the glass of a tank can be judged by putting a coin against the glass and estimating the thickness by the reflection.

Suggestions for society meetings are (1) to pull to pieces the remarks of the previous month's lecturer if possible (it usually is), and (2) to ask every visiting lecturer a stock question and analyse the answers at the year's end. Before the talk the lecturer passed round to everybody slips of paper with ten numbered squares thereon. During the meeting he proposed to make ten statements at intervals and members were invited to mark their papers with an O for correct or with an X for incorrect. Quite a refreshing change. Thanks, Mr. Mandeville.

I was asked once to elaborate on pond troubles. There are so many that, like dog diseases, if one looked at them in cold print one would never keep a dog. Actually they work out at few and far between but it is as well to know what to expect if the worst comes to the worst. First I should put green water. Pond enthusiasts want crystal-clear water but rarely get it unless a stream flows through. Ponds should have some shade and plenty of growing plants both underwater and marginal. If the pond is too deep it is useless, if too shallow it becomes very warm in summer and freezes up in winter, and possibly cracks badly when the ice gets at it.

Unwelcome visitors to ponds are cats, owls, herons, seagulls and children. Birds are not much of a risk except in rural areas but cats are public enemy number one. The pond must be constructed so that pussy simply cannot have half a chance. One way to keep cats at bay is to plant floating plants all round the edges of the pool. Tall marginals also help. Children depend on what you and your neighbours have. A friend told me how his pond was always full of toys from next door, flung in by petulant youngsters. He fished these out and flung them back. Next day they were back in the pond. This went on several times. Fed up, he fished out the toys and put them in the dustbin and disclaimed all knowledge of them—no more trouble resulted. In urban areas soot is the enemy, it must be cleared daily by trailing sheets of newspaper over the surface to remove the scum.

Topping up in fish houses can be a bore where there are many tanks. A narrow length of hose pipe is a great help. One can always top up with cold water . . . the fishes won't suffer.

Public aquariums are constantly changing. Sometimes they are on the upgrade, sometimes on the slide. One sees this very obviously if you visit them fairly frequently. All other things being equal they are usually at their worst in the winter months. Losses are usually not made good until the following spring, daylight is at a minimum as also is live food and everything is against the aquarium being

able to put on quite so good a show as in the summer.

Bolton Aquarium in October looked to be experiencing difficulties of this kind. The plants were almost non-existent and what were there were poor. Some tanks had only two fish therein. Nevertheless, the visitor gets his money's worth because there is no charge for admission! I noticed a large tank (roughly 4 ft. by 4 ft. by 3 ft.), which had about a hundred small fishes of many varieties. It was strange how each variety seemed to keep together, zebras, danios, serpaes, neons, barbs and harlequins. This Aquarium always manages to have some outside fish on view and this time I was struck with a 4 in. blind cave fish, as well as several Buenos Aires tetras equally as large.

A large terrapin shared quarters with about 20 golden orfe, a minnow and a gudgeon, and in another tank another large terrapin was bed-fellow with a number of large goldfish. No ill-effects could be observed in either tank. Some of the rudd and golden tench were rather hollow-bellied, but this is nothing new with tench. Some golden rudd were on view, a fish rarely seen nowadays. These are best when not too yellow, and when fins and eye are a bright red and not pink.

This Aquarium has always some children looking round it who are obviously most interested, and the fact that it is free encourages the younger end to see something of the hobby. I notice that the main attractions to them are pike, goldfish and large coldwater fishes—probably a consequence of the angling instinct. Tropicals, being so diminutive, are relatively beneath their notice.

Most hobbyists have some form of insulated container for carrying tropicals. Best of all are the Thermos type, which can be had in various sizes up to a gallon, although the last becomes very heavy if one has to carry it any distance. A bottling jar in a container lined with any form of insulating material serves very well. When carrying fishes see that the jar is almost full; this helps to conserve heat and reduces travel discomfort for the fishes. Anabaptids, of course, need some surface air or they will die. Travel on the train can be difficult when you have only a makeshift form of container in the depths of winter. Get a compartment to yourself, if possible, close the windows and turn on the heat. Putting the container on the floor underneath the seat, and thus near the heating pipes, helps. If you have to share a compartment with fresh-air fiends change compartments at the next station. If you are carrying coldwater fishes the reverse applies. Get a compartment to yourself but turn off the heat and open the window. It can become very warm indeed on a long journey with a packed carriage.

You also have to watch your smokers . . . the type who smoke old rope produce clouds of poison gas to your fishes, and as coldwater fishes are often carried with the water surface free to the air, this can be quite a risk on a long journey. Train travel is fairly easy on the motion but once you board a bus anything can happen. Invariably one gets a learner-driver who seems to delight in jerking the bus, and you and your fishes, five times a minute. The least vibration is probably felt downstairs in the centre, but there is sometimes petrol fumes and you have the difficulty of standing passengers. In a bus it is wiser to hold the can all the time and not put it on the floor.

Tin cans are very useful and large ones are "just the job" for carrying large pond fishes. I have found they can be painted inside with Japanese lacquer without any ill effects to fishes subsequently carried. However, a rusty interior will not harm fishes in moderation, although it is bad for snails. Always clean cans with cold water; if you pour in boiling water you may get it very clean, but when next you want to use the can you will find it leaks like a sieve. Bait cans, as used by anglers, are really excellent if large, as they have a wide base and a convenient handle with hinged lids.

## Jewel Fish, Red Cichlid or Red Chromide

(*Hemichromis bimaculatus*)

ORDER: Percomorphi, from Greek *perke*—perch, and Greek *morphe*—shape.

FAMILY: Cichlidae, from Greek *kichle*—a kind of sea fish.

SPECIES: *Hemichromis*, from Greek *hemi*—half, and Greek *chromatos*—coloured; *bimaculatus*, from Latin *bi*—two, and Latin *maculatus*—spotted.

WE often refer to our tropical fishes as "living jewels." Here is a fish with the popular name of "jewel," which unless kept in conditions which suit it appears only as a somewhat drab creature bearing a few blue spangles. Dealers' tanks, with few exceptions, therefore are not the best places to form one's final opinion about them. I have seen them looking less colourful than native coldwater fishes.

At home, in slightly acid water, with a temperature of near 80° F., and a plentiful supply of live food, they can hardly be excelled for coloration. Anyone intending to exhibit them should remember what is required and endeavour to secure just such conditions in the show.

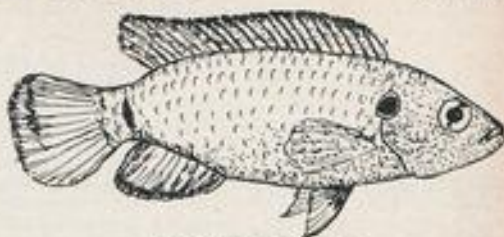
Another interesting point about these fish, which serves to emphasise how inconsistent aquarists are, is the fact that whereas the three-spot gourami is so called because it has two spots on its body in addition to its eye, the jewel fish, also having two spots in addition to its eye, is called *bimaculatus*, and not *tri-maculatus*. Not one of the largest cichlids, it seldom reaches more than 4 in. in length.

Some writers recommend keeping the jewel fish in a tank containing other equally big cichlids, but I incline to the opinion that any fish which is likely to be pugnacious should be kept with other members of its species rather than with different species, even of the same family. If the sexes are mixed, there is a reasonable chance of domestic harmony, for these fish sort themselves into pairs, and if the tank is sufficiently large, several pairs will get along fairly well. Each pair picks their own territory.

When breeding time arrives, the pairs manifest great activity, cleaning up the spots where egg-laying is contemplated. There is a marked preference for the insides of flower pots, although in the absence of these, the eggs may be deposited under an archway of rock. A roof over the eggs seems to be an essential, and a flat, hard surface (not sand) upon which to deposit them. The female passes the eggs through an ovipositor, which is short, blunt and horny, and the male fertilises them through a longer, more pointed organ. Eggs are laid in an orderly manner, in one mass. Once they are laid, both parents take to vigorous fanning, which is kept up continuously by one or other of them.

In a temperature of 80° F. the eggs will hatch in about 2 days. After hatching, the fish move the fry to a depression previously scooped in the sand, and maintain a constant vigil for real or imagined enemies. This is the period when they are at their fiercest, ready to attack anything that moves near enough to seem a threat.

Within a week the youngsters, which have been moved from one prepared depression to another several times, will be free-swimming. Copious supplies of the larger infusorians will keep them growing. If there are insuffi-



*Hemichromis bimaculatus*

cient to satisfy their needs, a little fish paste will be eagerly taken instead, although at first they may ignore it. I have noticed this repeatedly with fishes. The introduction of any food, live or dry, to which they have not already become accustomed, will not be regarded as a welcome change, but as an attempt at interference with normal routine. Even if taken into the mouth it will be spat out again, until the flavour, or smell, registers itself as attractive. A food thus rejected may eventually become a favourite, avidly snapped up as soon as it enters the water.

Feed as much and as variable a diet of small live foods as possible, keep the temperature round 80° F. and watch the little ones grow. Parents will be ready to spawn again in a fortnight or so, and it is wise to remove them early enough to ensure that their breeding pugnacity does not result in the destruction of the previous progeny.

## Anglo-German Exchange

AT the annual conference of the V.D.A. (Federation of German Aquarists) held in 1958, it was agreed that a method should be sought enabling German aquarists to correspond with aquarists of other nations on matters dealing with the hobby. A large number of aquarists in Federal Germany desired to correspond with aquarists in the Americas and a few wished to correspond with British aquarists, as they are of the opinion that a mutual exchange of ideas and theories would benefit all concerned. The Federation of British Aquatic Societies is co-operating in this venture and has asked *The Aquarist* to publish names and addresses of German aquarists seeking British correspondents. All are conversant with our language in both speech and text, and their subjects of interest are also stated.

An exchange of correspondence will be seen to be of advantage to the serious hobbyist as it will undoubtedly enable us to broaden our knowledge on some subjects and even help us with some of the matters which have perhaps proved difficult.

Guenther Rašek (age 26). Ludwigsburg, Haendelstrasse 14, Germany. Interests: all aspects of herpetology.

Heino Hinz (age 27). Bremerhaven G, Duesselstrasse 17, Germany. Interests: catfish; Amazon plants. Aquarium making including the manufacture of aquaria from plastics and other artificial materials.

Josef Goerrings (age 32). Koeln-Bayenthal, Hebbelstrasse 48, Germany. Interests: *Cryptocoryne*; *Hyphessobrycon*, *Brachydanio* and *Rasbora* fish species.

Rolf Nagel (age 25). Osnabrueck, Surtthauer Strasse 30, Germany. Interests: dwarf cichlids and other small cichlids.

Gerhard Eggers (age 32). Duisburg-Hamborn, Duisburgstrasse 60, Germany. Interests: fish and reptiles but particularly African fishes; plant-rearing and photography.

# On with the Show

by JAMES L. KELLY

**W**ALKING round a fish show recently and gazing at the row after row of tanks (arrayed more like soldiers on parade), I realised that nothing distinguished one from another but an occasional card marked "Section so-and-so," or a small piece of gummed paper, stuck on the front glass and announcing to all and sundry "Class A, Tank 6." This made me stop in my tracks and wonder! I was struck forcibly by the general air of drabness and began to ask myself what was the reason for it all?

These shows perform many functions. The obvious one is that enthusiasts can meet together in open competition and show off their fishes. The entrance fees and gate receipts, too, can help to swell the club's funds. It is this latter reason that I want to discuss. Are we becoming so specialised in this hobby of ours that we can afford to ignore a potential source of income—namely, the paying public who come to see the show?

It's all very well for we aquarists; we would come along even if the fishes were displayed in milk bottles, but to the man in the street, even a toothless piranha is nothing, until its other more famous activities are explained to him.

American societies long ago realised the importance of brightening up their shows. Judicial arrangement and full use of colour are all used by them to make a crisp, interesting show. Too often over here we think along the lines that a few dozen tanks, their stands shrouded in sack-ing (with the occasional furnished aquarium thrown in), is enough—it isn't.

If we are to foster the cult of fishkeeping, we must take a leaf out of the book of other exhibitors, in other fields, and make our presentations attractive both to expert and amateur alike.

Most show secretaries (that is if they are still reading this article and have not collapsed with a burst blood vessel), no doubt will be saying to themselves "That's all very well, but it is a trying and almost thankless job as it is, even to organise a show on simple lines."

Gentlemen, I agree. The many show secretaries I have had the pleasure of knowing are doing a fine job, but there is an old saying: "Many hands make light work." It's about time that more of these shows were supported by all society members, and not by the hard-working, ever-



Unusual ways of showing aquaria at exhibitions have been adopted at the British Aquarists' Festival in previous years. Above is an exhibit by Burnley A.S. and the other photograph on this page shows a "room" staged by Wombwell A.S.

willing few, as seems to be the case in the majority of shows I have visited.

The ladies, too, could be brought into the picture more. But please don't get me wrong here. I know quite a lot who are doing Trojan service, but there is still plenty of room for more of the fair sex amongst our ranks. They can add the finishing touches often overlooked by the male sex in general.

Now for some suggestions on how to set about this seemingly gargantuan task. Firstly, let us have a hunt around amongst our own rank and file. Talent galore must be lying there, untapped, amongst our club members.

There must be plenty handy with pen, pencil and brush, who could execute drawings and illustrations, instructive diagrams to be placed around the hall, showing the layman the various facets of our hobby.

Most publishers of aquarium literature would, I'm sure, be only too glad to supply printed matter, which, if mounted on hardboard and displayed prominently, could brighten up the show scene.

Local florists could be tempted to put on a display of, say, contemporary plants (think of the advertising value), which I'm sure are coming more to the forefront with the growth of the aquascape.

Away, too, with those drab tank labels, usually amongst other things giving a scientific name, meaningless to everyone except the fish's owner and the secretary who had to look it up to find how it was spelt.

In their place let's see a few notes on the tank-occupant's place of origin, and any interesting remarks of general interest to the man in the street. It can be done with careful foreplanning.

Community tanks, too, could be set up round the room to show the lady of the house how a well set-up aquarium can add to the beauty of her living room or brighten up a drab hall.

At the British Aquarists' Festival held at Belle Vue, Manchester, in 1956, Burnley Aquarist and Zoological Society put on an exhibit entitled "The Galleries." It took the first prize and showed fish tanks set in the walls, sur-





An example of the use of attractively presented background information is seen in this marquee scene, pictured at the Hendon A.S. sixth annual show

rounded by gilded picture frames in a Baronial Hall setting. Wombwell and District Aquarists' Society took second place at the same show with a room furnished in modern style and providing the contemporary setting for built-in aquaria. Exhibits like these can do much to show how attractive tanks in the home can look.

The trend in the daily Press and on television is that Mr. and Mrs. Public want to know a good deal more about the world around them and especially about its occupants.

Let's give them just that, by means of maps showing the homes of the various species of fishes on show. Diagrams explaining such things as setting up a tank, or even the names of the various parts of the fish. There must be a thousand things to illustrate.

A stall could be set up and staffed as an Inquiry Bureau on similar lines to the "Ask Me" girl counters we see in our big stores. Here the beginner could seek advice.

The South London Aquarists' Society featured a Fish Hospital at their show. Here visitors could take their sick fishes for treatment and advice. How successful the treatments were I don't know, but it was definitely a highlight of the show.

What about a "Swops Stall?" Here members could bring and display any surplus fishes, plants and even equipment for exchange or sale. I know I would have been glad of somewhere to buy someone's surplus fishes a little cheaper when I first started the hobby.

These are just a few ideas. If you have any more for brightening up the show scene let's have them. Shared through the medium of these columns, they can be of immense value to people who are organising shows.

Many societies in the length and breadth of these islands regularly put on interesting and entertaining shows, but in the main much is still to be done. It needs everyone (to quote a very old Lancashire phrase) to "muck in," and pull their weight.

The reward? That would come in the satisfaction of a job well done, increased profits and last, but by no means least, more outsiders to swell the ranks of the fishkeeping fraternity.

Away with the sackcloth and on with the show!

## Maintaining Small Aquaria

by K. SMITH

I AM prompted to write this because of the success I have had in maintaining a small tank of fish in perfect condition for over 18 months now with very little trouble and expense.

I am sure there would be many people who would keep a tank of tropical fish if the initial outlay was more modest. The tank I have measures 16 in. by 8 in. by 8 in., this size being decided upon because it just fitted underneath the television table—the only suitable available space in my living room. My first problem was what sort of plants could I have in such a small area which would look attractive and not grow too fast. After much thought I decided that *Cryptocoryne beckettii* would be just right and this has been proved, because the plants that are growing in my tank now are the originals and have not been touched during this time except for cutting off an odd dead leaf now and again.

*Cryptocoryne* are I think the best plants to use if only one species is to be employed to decorate an aquarium. I therefore set about furnishing my tank with fairly fine gravel and four or five small rocks to add to the decorative effect. I then calculated that a 25-watt heater working in conjunction with a submersible thermostat would be quite adequate to keep the water at the desired temperature. There is a make of heater on the market at this wattage which is ideally suited for small aquaria; it is only 2½ in. long, and small enough to permit easy concealment.

I use a small home-made light reflector in conjunction with a cover glass which fits inside the top tank frame, held in place by patent holders available at most aquarist

dealers. This prevents the top of the tank frame from rusting away; the metal is usually pressed steel in this size of tank. I have found that a 25-watt pearl bulb burning approximately 8 hours a day is just the right amount of light for this set-up, provided that very little natural daylight is available. I think that if the light can be placed towards the front of the tank it shows the plants and fishes off to best effect.

My final problem, in order to bring my small under-water scene to life, was to decide on the type of fish which would fit into this display most effectively, and I finally plumped for neons because of their size, hardiness and colouring. I reckon that approximately eight neons is just about right for this size of tank. Cardinals would be just as appropriate, but, of course, this would increase the initial expense considerably.

We come now in my opinion to one of the biggest snags in maintaining small aquaria successfully: feeding. The water in a tank of this size is soon turned foul if discretion is not used about the type and quantity of food introduced into it. Neons have only small mouths and not very voracious appetites, and I find that dried food is not really relished by them; so I decided to feed nothing but live food, and came to the conclusion that brine shrimp was the answer.

Now this might seem expensive and a lot of bother, but it is not so really. A 5s. phial of brine-shrimp eggs will last eight neons a very long time, feeding them about once every 24 to 36 hours, thus allowing time for each batch of

(Continued on page 237)

# The Smaller Skinks are Easy to Keep

by ROBERT BUSTARD

THE skinks (family Scincidae) comprise one of the largest lizard families, some six hundred species being distributed throughout the warmer parts of the world. Many of these lizards prove interesting and easily kept vivarium inmates.

They can be divided into two groups. The smaller species are largely insectivorous and active lizards, usually with long slender tails. The larger types, on the other hand, are typified by such species as the blue-tongued and stump-tailed skinks, which are lethargic and feed on raw meat and fruit.

It is possible to mention only a few species by name and describe their treatment in detail. Others can be treated accordingly. The species described below are those which are most commonly available in Britain, excluding the European members of the group to be described later. Those available originate chiefly from Africa and America, and prices of them are usually between one and two pounds each.

The vivarium for these active little lizards should be as roomy as possible, and certainly not less than 24 in. by 18 in. by 18 in. for a couple of pairs. The lay-out should be arranged to fit in with their natural surroundings. Species coming from arid semi-desert regions should not be kept with others whose natural habitat is dampish regions.

The South African three-striped skink (*Mabuya capensis*) can be taken as typical of those from rocky and sandy areas. This lizard measures from about 7 to 10 in., depending on the length of the tail. It is attractively marked in delicate shades of brown. Often the lines are absent, the pattern taking the form of speckles. I have found that this lizard

does very well in a vivarium of the size mentioned above. I keep mine in company with zonures. The vivarium should have a good layer of sand (3 in.); succulents and cacti can be planted in this (preferably in small flower pots for easy removal). If this is carefully done the result can be extremely pleasing. Against the sides and back of the vivarium I arrange large stones to provide plenty of hiding places, and towards the back I have a large flat stone forming a basking platform. Once again care in selecting attractive pieces of stone will greatly enhance the set-up.

I maintain the vivarium at about 75° F. during the day, by means of a light bulb as explained previously. A small water dish is always present, as these lizards drink frequently. At night the temperature can safely fall to 50 to 55° F. Some dry moss can be added to the vivarium if desired.

A good supply of live food must be maintained at all times. If cultures of mealworms are kept or if these are bought regularly they will provide a good standby. They are relished by all the skinks described. Gentles and blue-bottles are also taken but the three items mentioned should be given alternately, or varied, as the animals quickly tire of any one item of food. Variety with these small lizards is very important. Spiders, which are appreciated by most lizards, are a real tit-bit. These small skinks quickly become tame and will soon accept food from the fingers.

The beautiful speckled skink (*Mabuya homolocephala*), which also comes from South Africa, is sometimes available. The following description I wrote when I received my first specimen: "coloration greyish, with orange stripe down each flank, extending on to the tail." These fine lizards are shy and should not be kept with the bolder *Mabuya*



Photos:

Striped skinks (*Mabuya striata*)

Robert Bustard





U.S. bronze skink (*Eumeces obsoletus*) with young

*capensis*, which is apt to become a bully. They both require the same conditions, however.

Another species widespread in Africa—I have received specimens from Kenya and Southern Rhodesia—is *Mabuya striata*. This striped skink is rather attractive, having two dorso-lateral stripes of a pale brown or straw colour on a rich-brown background, which is peppered with paler spots. The throat is often reddish. The general appearance of this skink is clearly shown in the accompanying photograph of a couple of specimens in my vivarium. In my experience this species has proved shy, initially at least. I have always kept it in more humid conditions and with richer abundance of vegetation than suggested for the more southerly species. A temperature of 75° F. is recommended. Like the species described above it is viviparous and the lucky collector may be presented with a family of possibly three or four young, measuring about 2 to 2½ in. in length. With *Mabuya capensis* I have known the number to be as high as seven!

#### American Skinks

Turning to the American skinks, the sonoran or bronze skink (*Eumeces obsoletus*) is, in my opinion, one of the finest. (The many common names given to this skink shows the importance of the scientific nomenclature in identification.) This lizard often reaches about 12 in. in total length and, although it seldom tames well in the vivarium, makes a most handsome exhibit. They are always apt to bite and they will hold on for several minutes. The bite, while harmless, is often quite painful.

The illustration shows an adult female with two young. The young are darker in colour than the adults and have bluish tails. An adult female is usually brown or grey with the scales edged with black. This coloration gives it the alternative name of grey skink. Male specimens frequently display the attractive bronze colour. *Eumeces obsoletus* inhabits grassy slopes, where it hides under leaves and fallen trees. The vivarium should be arranged accordingly. I have found a temperature of 70 to 75° F. ideal.

Finally, mention must be made of the five-lined skink (*Eumeces fasciatus*). This attractive lizard, like *E. obsoletus*, is oviparous, the female coiling round the eggs until they

hatch. It measures about 8 in. The coloration is extremely variable and as with *E. obsoletus* varies between the adult and young and also between the two sexes. Adult males have a reddish coloured head, and this colour is more pronounced in the breeding season. This skink definitely likes moist surroundings, being found in woodland areas where it often hides in rotting logs or under leaves. If these conditions are simulated in the vivarium it lives very well. I kept my specimens at about 70 to 75° F. Like all the above-mentioned species it is insectivorous.

Many of the species described are often available and an attempt should be made to procure them. If other species come to hand the general principles described should be applied and a study of the skink's natural environment will help in the arrangement of a suitable vivarium for them.

## Maintaining Small Aquaria

(continued from page 235)

eggs to hatch out. Brine shrimps will live quite a few hours in fresh water, giving the neons plenty of time to eat up, and if anybody has objections because the diet is not varied enough, I can only say that my fish are still swimming about healthily after 18 months. If there is an ideal food, brine shrimp is it.

Here is an approximate cost of the main items required for this aquarium:

	£	s.	d.
Tank .. .. .	17	0	
Light reflector (if bought) .. .. .	7	6	
Thermostat .. .. .	12	0	
Heater .. .. .	10	0	
Thermometer .. .. .	4	6	
Plants .. .. .	15	0	
Fish .. .. .	2	0	0
	£5	6	0

The above prices are approximate and could possibly be improved upon slightly, especially if less fish were bought initially.

## our readers

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.



## write

Address letters to The Editor, *The Aquarist*,  
The Butts, Half Acre, Brentford, Middlesex

### First Life

IN the November, 1958, issue of *The Aquarist*, Mr. Raymond Yates mentions in a book review, the "most plausible" "theory" that life originated in a virus-like form. Both terms, "plausible" and "theory," are most unfortunate descriptions of this idea. Viruses are so "simple," precisely because they depend on the metabolic pathways of other cells. Viruses can only show their living nature, i.e. by growth and multiplication, within the cells of higher organisms. Without the biochemical reactions of higher cells (which they use to their own ends, since they are parasites), viruses cease to "live," i.e. they become, as far as can be ascertained, inactive protein molecules. This renders the above "theory" improbable to say the least. There is a theory that viruses are actually products of deranged higher cell metabolism, these products in turn affecting still more cells to produce further virus particles. Should this prove to be correct the virus-like origin of life would seem even more absurd.

Furthermore, virus particles are not so simple as might be imagined. They consist of two fractions: (i) nucleic acids; (ii) proteins. Both are of such complexity that they have never yet been synthesised in the laboratory, and have molecular weights of the order of hundreds of thousands. Not only so but the arrangement of each atom in this vast assembly in its spatial relationships with its neighbours, is all-important. The chance of such a colossal piece of biochemical architecture being synthesised by chance in a primaevial pool is exceedingly remote, especially as the individual building bricks, such as pyridine, the pentose sugars and simple amino acids, do not occur in nature except as a result of the activities of living things.

In conclusion it may be said that while the first life on this earth was almost certainly aquatic, extreme caution is needed in suggesting probable forms.

A. P. LAUNGBURY, M.P.S.,  
Birmingham 17.

### Double-sword Swordtails

MY father and I purchased a pair of albino swordtails in 1949 and we are still breeding from the same strain, which I might add has shown itself to be remarkably good, without any signs of the golden swordtail so often seen among albinos.

During the early part of 1954 we were very surprised indeed to notice that one of the males, which had just commenced showing its sex characteristics, had started to develop an extension to the upper part of the caudal fin. The fish was immediately segregated from the remainder of

the family where the upper extension of the caudal continued to develop at the same rate as the usual sword, but it extended over two rays only and was more uniform in thickness, except that it did terminate in the usual point.

When the male was eventually full grown it measured approximately 4 to 4½ in. in length, from nose to tip of tails, and at this point rightly or wrongly we paired it up with one of its virgin sisters, and when this pairing eventually produced young we decided to dispose of all the other stock of this strain and follow the line from the double swordtail.

Unfortunately, the male died suddenly for no apparent reason, just when it appeared to be at the prime of its life, and although it was our intention to report our findings the idea was shelved because we had no decent photographs to support it and we thought that there was always the possibility of the recurrence of this phenomenon.

Eventually, in 1955 or 1956 another male did develop a top sword, but this time although the size of the fish and the length of the top sword were comparable with those of the first male, the extension appeared to be on one ray of the fin only and unlike the first instance when the top sword was held stiff and proud, this one, although not drooping in any way, appeared to wave about more as the fish swam round the tank.

No further evidence of this development to the upper part of the caudal fin had been noticed since this period, although it must be stated here that the majority of the fish are, of course, disposed of before they are sexable and we consider it possible that further instances have probably passed unnoticed in community tanks.

However, only a few days ago I happened to notice, in a collection of fish that one of our society members was donating to a tank which we maintain in a local boys' home, that a male albino sword which we know to be from our own strain showed a slight indication only of developing a top sword. Unfortunately the fish has developed prematurely and is not more than 2½ in. long, but it has proved to us that the tendency for this strain to develop a top sword is still present, although instead of developing, as we might have thought, it appears to be receding. F. W. DODDS,  
Lincoln.

### Platy at Low Temperature

LAST year I tried, as an experiment, introducing a yellow wagtail platy into a coldwater tank; the tank temperature was 56°F. The other occupant is a moor.

To my surprise on the last week of July, I discovered a young platy in the tank (temperature at the time was 58°F.) and the young platy is now ½ in. long. I have been told it

is a rare occurrence for a birth at such a low temperature, so was advised to let you know the facts. I am mainly interested in coldwater fishes, but thought you may be interested in what happened. Incidentally the fish seem quite happy in this lower temperature.

E. RUSSELL,  
Motherwell, Scotland.

#### Chinese Film on Goldfish

OUR new film is a one-reel film, running 12 minutes, in colour, with English sub-titles, showing a wide variety of Chinese goldfish and something of their breeding. We hire it out for 7s. 6d. plus postage. This film will, we are sure, appeal to aquarists and fish fanciers, and we should very much like them to know about it.

(Mrs.) E. V. PENN,  
Assistant Secretary,  
Britain-China Friendship Association,  
228, Grays Inn Road,  
London, W.C.1.

#### Cabinet Stand

AFTER reading through my copies of *The Aquarist* as yet I have not come across an article from a person who has built a prefabricated cabinet. Quite recently I completed a prefabricated cabinet, the cost being £4; this includes one two-tier stand (£2). The stand was built to take a 24 in. tank, with a lower 18 in. tank. Converting the stand into a cabinet, I made two hardboard sides and back, these were bolted to the stand and to top and bottom wooden jigs. Later three flaps and rails were made, the middle one being bolted to the stand and the others were screwed to the top and bottom jigs and sides. Next two frame fronts were made, the larger front being screwed and the smaller one plugged in to the front; later a top, glass, clips and handles were fitted.

The cabinet can be taken apart in less than half an hour and looks neater and cleaner than a plain stand.

B. BARROW,  
Maidenhead, Berks.

### Cacti in the Fish House

Towards the end of this month many cacti will be commencing to grow and it is a good time to repot those plants which need it. Any plants making good growth will benefit from a repotting and most young plants should not be kept too long in the same pot. It may not be necessary to place the plant in a larger pot but the soil is soon impoverished during a year's growth and so needs replacing with some good fresh compost. John Innes potting compost no. 2 can be used as long as one-sixth part of very sharp coarse sand is added with a little crushed brick or granulated charcoal to increase the porosity of the soil.

#### PICK YOUR ANSWER

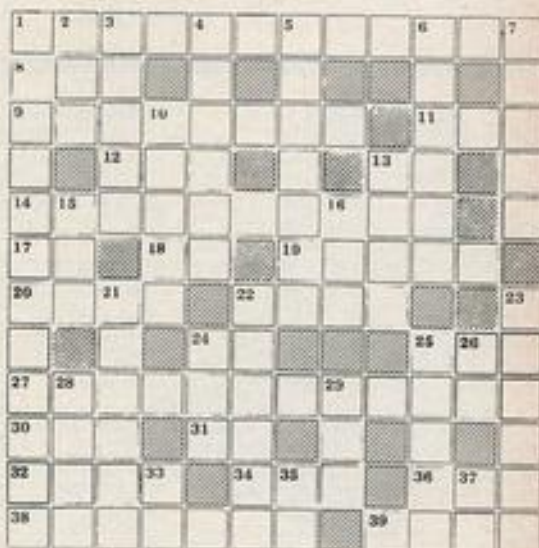
- Which of the following geological periods is known as "The Age of Fishes"? (a) Cambrian; (b) Devonian; (c) Ordovician; (d) Silurian.
- Cyprinodon nevadensis diabolis* (the devil's-hole fish) is found only in one hot spring in Nevada, which has a mean average temperature of: (a) 86°; (b) 90°; (c) 94°; (d) 98° F.
- Feather-fin tetra is the popular name of: (a) *Hemigrammus nana*; (b) *Hemigrammus ocellifer*; (c) *Hemigrammus pulcher*; (d) *Hemigrammus ustulatus*.
- Hyphessobrycon* (the dawn tetra) is native to: (a) Bolivia; (b) British Guiana; (c) Colombia; (d) Ecuador.
- Rasbora heteromera* (the barlequin fish) was named by: (a) Boulenger; (b) Duncker; (c) Günther; (d) Hamilton-Buchanan.
- The great diving beetle (*Dytiscus*) is represented in British freshwater by: (a) two species; (b) four species; (c) six species; (d) eight species.

(Solutions on page 240)

G. F. H.

## The AQUARIST Crossword

Compiled by J. LAUGHLAND



#### CLUES ACROSS

- Kryptopterus bicirrhus* (5, 7)
- Sicken as when the sailfin loses fins (3)
- It is neither worm nor snake despite name and form (4, 4)
- Related by blood as — b—— is in a way (3)
- In returning, the Spaniard affirms (2)
- Assessment of a tuna I love (10)
- Gunners start on *Rasbora* (1, 1)
- By the Grace of God (1, 1)
- Group of genera having many points in common (5)
- Lively golden fish for garden pond (4)
- Body waste carried off through kidneys in animals (4)
- City of the Chaldees (2)
- Girl's name, confused nap without a penny (3)
- Fancy goldfish, Nelson's blind one (9, 3)
- Etymology in short (3)
- Vulgar form of inquiry (2)
- Employs (4)
- Fry of devil fish? (3)
- Prue loses her head, a matter for regret (3)
- Among the most popular of small fish imported (7)
- Young salmon sounds as if it were on the level (4)

#### CLUES DOWN

- Stickleback (12)
- In short, the girl is named after a water plant (3)
- Shad (5)
- Alien water hog-house (3, 3)
- Device for oxygenating the aquarium (7)
- One of the four non-metallic elements. Seaweed is a rich source of it, so are shellfish (6)
- The tiny "octopus" of our ponds (5)
- I weld for the notorious Oscar (5)
- Kind of water for man of spirit rather than us (4)
- Kind of a species, in short (3)
- Temper of mixed pond-hunter (3)
- Usually used in connection with 5 Down (6)
- Starfish (6)
- Fish with poisonous spines (6)
- Employ (3)
- Danio of sorts (5)
- Hail (2)
- This body gave concerts to troops (1, 1, 1, 1)
- Young dogfish? (2)
- Not detached (1, 1)
- Ego of medaka (2)
- Are you recurring by the sound of it? (2)



## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

THE results of the competition held at the Cape Birds Show at Olympia were as follows:

Inter-club Tropical Furnished Aquaria: 1, Hendon A.S.; 2, W. Middlesex A.S.; 3, Independent A.S.; 4, High Wycombe A.S.; 5, London Transport (CRS) S.A. Aquaria Section; 6, Walthamstow A.S.; 7, Hendon A.S. Inter-club Coldwater Furnished Aquaria: 1, London Transport (CRS) S.A. Aquaria Section; 2, Walthamstow A.S.; 3, Harrow A.S.; 4, Portsmouth A.S.; 5, Thameside A.S.; 6, West Middlesex A.S.; 7, Hendon A.S. Individual Tropical or Coldwater Aquaria: 1, R. C. Harvey; 2, R. Mayerberth; 3, M. A. Langridge; 4, J. Stewart; 5, Mrs. A. S. Wilson. Miniature Gardens: 1, B. Meadows; 2, T. S. Hobday. Miniature Furnished Aquaria: 1, Mrs. F. M. Watts; 2, J. Chalmers; 3, A. Baldock; 4, F. Oliver; 5, F. H. Watts; 6, H. White; 7, A. J. Haynes.

RECENT activities of the Aylesbury Aqualife Association have included a film show and the annual dinner and social. The film programme consisted of six films and a cartoon and made an enjoyable evening. The annual social was also thoroughly enjoyed and the 1959 programme is being awaited with plenty of interest.

NEWS from the Nottingham and District A.S. gives the results of the Tropical Points Competition, based on the monthly table shows, the final placings being as follows: 1, Mrs. M. Neal, 31 points; 2, Mrs. M. Hunt, 27 points; and Mr. S. Starbuck, 20 points. The result was in doubt up to the last show and Mrs. Neal becomes the first winner of the cup for this event.

THE Bristol Coldwater Fish Breeders Group meet on the first Wednesday of each month at the "Old Duke", King Street, Bristol. The objects of the group are the furtherance of the knowledge of fishkeeping, the line-breeding and exhibition of fancy fish and the utmost co-operation with all bodies to the common end. A great deal of selective breeding of both the Bristol Shubunkin and the red-sealed veiltail has been done already. Full details of this Group may be obtained from Mr. G. Harper, 48, Oxford Street, Tottenham, Bristol, 3.

EXCELLENT progress is reported from the Brighton Amateur A.S. for 1958. At the end of the previous year the Society was completely reorganised due to a drift away of the members and that the reorganisation policy has been successful is obvious from a good increase in members and also the finances. In addition there are seven junior members. It is hoped to increase the number of table shows this year and several contacts with the schools have been made with the object of increasing interest in fishkeeping. A number of tanks have also been installed in the Municipal Museum. The secretary is Mr. E. A. Billenness, 23, Osborne Road, Brighton, 6, and new members can be assured of a good welcome.

OFFICERS elected at the annual general meeting of the Erith and District Aquarists' Society were: Chairman, Mr. E. Quick; secretary, Mr. D. I. Bothwell 46, Shinglewell Road, Erith, Kent; assistant secretary and treasurer, Mr. D. J. A. Cooper; show secretary, Mr. C. Ruffin. Trophy winners, 1958, were as follows: Most points, K. Hallen; best fish of year, K. Hallen; coldwater breeders, K.

Hallen; livebearers breeders, G. Baker; flagbearers breeders, C. Ruffin. The society is looking forward to another successful year with a more ambitious programme. 1959 started with an excellent talk by Mr. Key, of Shooters Hill A.S., on "Garden Ponds." New members and visitors always find a warm welcome awaiting them at the Beleyheath Congregational Hall. Meetings start at 8 p.m. on the first Wednesday of every month.

AT the Colwyn Bay and District A.S. annual meeting, the following officers were elected: Chairman, Mr. A. L. Clayton; vice-chairman, Mr. J. R. Reed; treasurer, Mr. W. Barron; secretary, Mr. H. Wassop, 8, Abergele Road, Colwyn Bay. The secretary reported steady progress and hoped that members would do their best to introduce more people to the hobby of fishkeeping.

"SPECIALISE," said Mr. J. C. Faulkner, in his recent lecture on Breeding Egg Layers, to the Birkenhead and District A. and H.S. "Many unsuccessful breeders attempt too many varieties, with results from none. Stick to one or two species." This, members were told, was one of the pointers for success. A full breeding programme was detailed, specimens of equipment were shown, and details of his own good results with glowlight tetras were given. The annual turkey dinner was held on 14th January, when members of Merseyside A.S. were welcomed.

THE last meeting of the Dundee A.S. took the form of an experimental lecture by tape-recorder. The apparatus was kindly loaned by club member, J. Safey, and the lecturer was Mr. Matthew Kerr, the well-known Edinburgh aquarist. The Tape, which was enjoyed by all, is the first of a series which will form a Tape Library under the auspices of the Federation of Scottish Aquarist Societies. It was generally felt that the idea was excellent and that it offered great possibilities for the future. The Table Show was for Catfish (AV) and attracted 12 entries. The results were: 1, A. Cross (Corydoras aratus); 2, A. R. Bell (Corydoras aratus); 3, A. R. Bell (Corydoras aratus); 4, A. Cross (C. jellii). This table show now places the Scott Trophy positions as follows—A. Cross 7 points; A. R. Bell 5 points; G. B. Kirkland, E. Seymour and A. Finken 4 points; K. Webster 3 points.

THE recently formed Keighley and District A.S. held an inter-Society show recently, when there were 28 entries from members of the Keighley, Bradford and Skipton Societies. Mr.

### THE PET TRADE ASSOCIATION

The Annual Dinner and Dance will be held on Thursday the 19th February at the Windsor Castle Hotel, Victoria, London, S.W.1. Owing to the enlarged membership the number of tickets is limited and these should be applied for early. The closing date for applications is the 11th February, and tickets can be obtained from: Mr. R. A. Fairbairn, 15, Well Hall Parade, Eltham, London, S.E.9, the cost being 30s. 0d. each.

B. Gill, of Bradford, who was judge, commented on the excellent standard, and gave 2 short addresses on: "Setting up Aquarium." Results: Livebearers: 1, 2 and best in show, K. Smith; 3, B. Warwick. Barbs, minnows and carp: 1, B. Warwick; 2, F. Townsend; 3, A. Thornley. Labryrinth: 1, A. Thornley; 2, B. Warwick; 3, F. Townsend. Catfish, cichlids and loach: 1, W. Feather; 2, M. Jenkinson; 3, C. R. Wilson. Characins: 1, W. Feather; 2, A. Mitchell; 3, C. Dobson.

The Keighley Society's new secretary is Mr. T. Atkins, whose address is 14, Lynton Drive, Riddlesden, Keighley.

AT the annual general meeting of the Sheffield and District A.S., the officers elected were: President, Mr. S. A. Abdy; vice-presidents, Messrs. E. Chapman and F. R. B. Nutt; hon. secretary, Mr. R. P. Middleton; assistant hon. secretary, Mrs. M. Knowles; and treasurer, Mr. D. Morton.

Meetings for the coming year will be held as before, on alternate Friday evenings in the Postman's Club, Milk Street, Sheffield, and prospective members should contact the hon. secretary, Mr. R. P. Middleton, 95, Old Park Road, Sheffield, 8.

The society's annual dinner was held recently, when prizes were presented for the past year. The programme for the coming year is being planned, and the secretary will be pleased to hear from lecturers or persons who would be willing to loan suitable slides or films on aquatic subjects.

AT the annual general meeting of the Burton and District A.S., the following officers were elected: Chairman, Mr. R. Walker; secretary, Mrs. J. Henshaw, 58, High Street, Newhall, Burton-on-Trent; treasurer, Mrs. K. Darlow.

Plans were made for outings during the year to Dudley, Whipsnade and Chester Zoo, also for visits to different societies' shows. Those interested should contact the secretary for dates.

THE new office bearers of the Stirling A.S. are: President, Mrs. Clark; secretary, Mr. J. Ritchie, 63, Johnston Avenue, Cornton, Stirling, and Mr. P. Jenkins, treasurer.

AT the December meeting of the Llantwit Major A.S., Mr. T. Clissold gave a very interesting talk on cacti. He brought along many different specimens to illustrate to the members the many shapes and types that were available. The chairman, Mr. J. Dean, thanked Mr. Clissold for such an enjoyable evening.

THE final placings of the Table Show of the Bradford and District A.S. resulted as follows: C. R. Wilson 40 points, A. B. Thornley 29 points, K. Smith 14 points. Despite a fall in membership during the past year, the Society enjoyed a good year with a varied programme for the members. The secretary is Mr. K. Barrett, 68, Moorland Road, Pudsey, Yorks.

### Crossword Solution

G	L	A	S	S	C	A	T	F	I	S	H
A	I	L	O	E	O	O	Y				
S	L	O	W	W	O	R	M	D	U	D	
T	S	I	B	A	S	I	R				
E	V	A	L	U	A	T	I	O	N	A	
R	A	D	C	O	R	D	E	R			
O	R	F	E	U	R	E	A	W			
S	I	U	R				Z	O	E		
T	E	L	E	S	C	O	P	E	E	Y	E
E	N	T	E	H	U	B	V				
U	S	E	S	I	M	P	R	V			
S	A	R	D	I	N	E	P	A	R	R	

PICK YOUR ANSWER (Solutions)

1 (A), 2 (C), 3 (F), 4 (B), 5 (A), 6 (C).