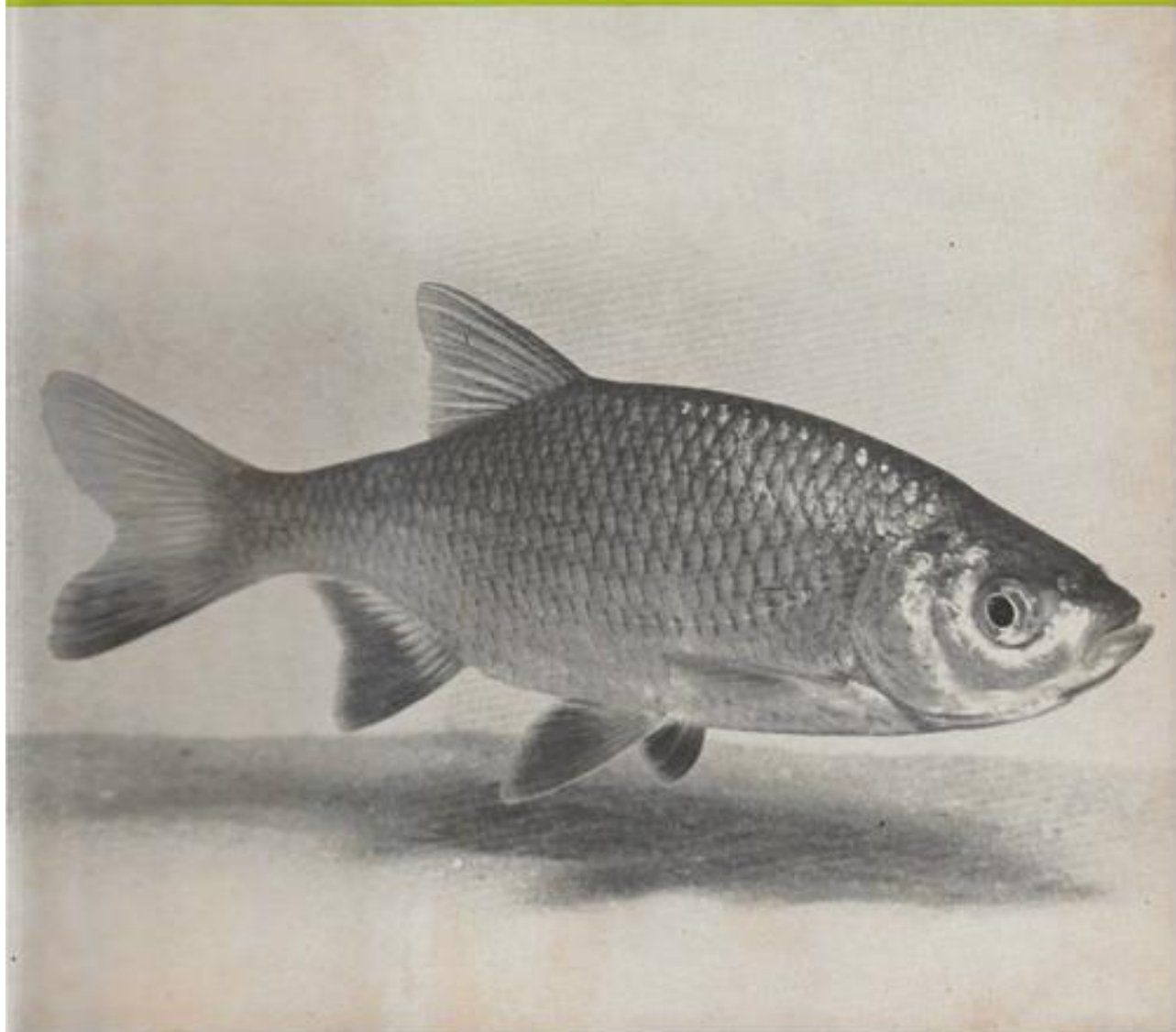


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The Editor accepts no responsibility for views expressed by  
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Editor: Laurence E. Perkins

February, 1969

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# COLD WATER FISHKEEPING

by A. Boarder

IT WOULD BE DIFFICULT to estimate whether coldwater fishkeepers are out-numbered by tropical fishkeepers or not. Many aquarists would think that the tropical ones were in the majority, but when one considers the vast number of people who have garden ponds today it might give tropical aquarists a surprise. During the past few years hundreds of gardeners have incorporated a pond in their gardens and in conversation with a very large supplier of pond equipment the other day I discovered that the sale of everything connected with ponds had increased enormously this past year. With the advent of such an increase in the number of pondkeepers it is not surprising that many of them have taken up keeping some coldwater fishes in tanks in the house. Many may have started by taking indoors some of the fry of the season's spawnings, and so have become enthusiastic with this side of fishkeeping.

There are advantages to both sides of the hobby; some say the tropicals are more handsome, whilst others say they are more trouble and do not live as long as a rule. No heat is necessary for coldwater fishes and so one can leave them unattended for long periods without the fear that the thermostat will stick or the heater fail. I kept and bred tropical fishes many years ago and it was on returning from a holiday that I lost interest as practically every fish had died.

The keeping and breeding of common goldfish may not be particularly intriguing, but that of producing some very good fancy goldfish will be found to be most fascinating. It must not be thought that such fish always reproduce replicas of themselves and it is only a very few exhibition specimens which are likely to be bred in any season. However, this is what makes this side of the hobby so attractive to those people who get satisfaction from succeeding with breeding excellent specimens

which are not produced with the regularity of neons, for instance. Any fish which has been altered considerably from the natural form is always likely to have many throwbacks among the young and so when one gets a very good fish one will have far more satisfaction than would have been the case with fish which all bred exactly alike.

I consider that every ardent angler should have a pond and if possible a tank house. So much can be learned from examining the behaviour of fishes at close quarters. Such anglers would soon appreciate the fact that most fishes will be more interested in a bait that moves than one which is static. This can be proved quite easily by dropping a few pieces of food into a tank. The fish will immediately swim towards the food as it falls and often once it reaches the bottom of the tank it is ignored. Therefore the advantage of keeping the bait moving will become very plain. Another reason for such a tank is that it will be seen that most fishes will always go for the largest piece of food every time. I have often watched an angler sitting at the water-side with his rod held steady for hours at a stretch. If such an angler realised how fish respond to a moving bait he would no doubt have had much more success if he had withdrawn the bait and thrown the line out again quite frequently. If fish are about when anything falls in the water they are immediately attracted to it. Even if the bait had been thrown right over them they would swim off at once but form a square, bringing them back to the exact spot they left in a couple of seconds. Often a handful of small stones thrown near the bait will bring the fishes investigating.

Another advantage to the angler who is a member of an angling society is that such men return their catch to the water after it has been weighed or checked. When handling such fish

much of their mucus covering is removed and this can soon bring a bad attack of fungus disease to the returned fish. Any angler who has a good knowledge of fishkeeping at close quarters will have an advantage over one who has no such "know-how." The garden pond can also be of use as the angler could find plenty of information as to the times and differing kinds of spawnings. For instance the close season for coarse fishing is from 15th March to 15th June, both days inclusive, but how many anglers know that few, if any, Green tench (*Tinca tinca*) spawn as early in the year as 15th June. I have been breeding these fish for 21 years and have never had one spawn until July at the earliest.

There seems little doubt that the large increase in the number of pondkeepers corresponds with the introduction of strong plastics for pond making. Before this the task was hard and so much concrete would have to be mixed that the prospect was enough to turn many prospective pondkeepers from the task. However, with the advent of such plastics as Butyl linings it is possible to dig a hole in the garden of almost any shape or size, cover it with the sheeting, anchor the edges with concrete slabs and run in the water. Such a pond can be made in a day, especially if the garden soil is on the soft side. With a good type of sheeting it is possible to run the water from a hose and as the sheet fills it will be stretched down and take the conformity of the earth excavated.

These ponds can last for many years as the material seems to be impervious to frost. It should be realised that thin plastic sheeting cannot be expected to withstand severe strain but the lining mentioned above will stand any normal wear and tear. In addition to the ease of making such a pond is the fact that it is now possible to obtain fibre glass pools, etc., so that a





series of waterfalls can be constructed without the fear of leaks at the joins. All that is necessary is to ensure that the upper pool protrudes over the lower one. Many types of water pumps are also available which enable the pondkeeper to construct waterfalls and fountains with little trouble.

The setting-up and maintaining of a coldwater tank in the house presents little trouble. No heater or thermostat is necessary nor an aerator unless the aquarist insists in trying to keep more fish in the tank than it will hold. Overcrowding is one of the chief faults in fishkeeping as few, if any, fish will thrive if kept in such conditions. Another point to watch is to see that the type of fish which is to be kept in the cold tank is one which is likely to thrive and survive in such conditions. Some common goldfish can be a nuisance in a tank if too large as they can uproot the plants and discolour the water by constant working at the bottom of

the tank. I find that rather small fantails are ideal for the tank as they do not disturb either plants or compost. They are not fast swimming fish and so are very peaceful fish to watch. They move about in the tank quietly but do not stay motionless like many of the fancy goldfish with very large finnage. The veiltails and orandas are not as good as fantail types in the tank, the chief fault is that they appear to almost sit on the bottom for hours on end. They are also rather prone to fin congestion more than the shorter-tailed kinds.

To be successful with a coldwater tank it is only necessary to service the tank once a week. With such treatment a tank can be left for many years. I kept two tanks in a living room for 17 years without ever emptying them or changing the rocks and plants. They might have still been running if my wife had not objected to the rust from the tanks staining the curtains. The frames became so bad that the metal was a

#### Pond made from Butyl rubber

series of flakes of rusty metal, and how they never leaked was a mystery to me. They were too far gone for repainting anyway and so out they had to go.

The weekly servicing just meant that the front glass was cleaned with a razor blade on a long stick, the mulm from the front half of the base was removed by siphon and fresh tap water was added to make up the loss. This usually meant that about three gallons was changed each week. Under this treatment my fish were always healthy and the plants only had to be pruned occasionally. As the fantails grew too large for the tank they were placed in the garden pond and young ones were brought inside. If I had been able to buy one of the many types of non-rusting tanks on sale today, I might have still had my tank many more years without ever having to change either the whole of the water or set-up.



# ORCHIDS IN THE FISH HOUSE

by Jas. Stott

SOME AQUARISTS WHO possess a fish house often embellish the interior with a few pot plants dotted about, here and there, which not only provide added attraction but with careful selection of plants, added interest. Those plants requiring only a medium intensity of light and a little heat usually make the best subjects for growing in such a position and, surprisingly, there is quite a range to choose from among which may be counted a few orchids and this will probably come as a surprise to many for there still seems to be a widespread belief that orchids are difficult subjects calling for special conditions and requirements for their successful culture. Another mistaken idea is that all orchids need great heat and will not grow with other plants. While it is true some species require a high temperature, among this great family of plants are a number which will grow well in cool conditions and are, in fact, often referred to as "cool-house" orchids and several of the more hardy of these, which possess a wider angle of tolerance, will do quite well in the average type of fish house where a minimum winter night temperature of around 45°F. can be maintained and to follow are a few suggested species.

A useful orchid for our purpose is *Ada aurantiaca*. It is probably one of the hardiest and, at the same time, reasonable in price, as orchids go. The flowers are small, brilliant orange-red with a distinctive purple blotch in the centre and a flowering period of some 5 or 6 weeks. The plant usually comes into bloom around April or May and the flowers are about an inch in diameter but, although comparatively small, are distinctly attractive. A quick grower, the plant soon makes a large specimen.

There are a few species among the *Cymbidiums* suitable for cool-house culture; easy to grow and bearing beautiful flowers they are not too

expensive. From among these one can be recommended for the fish house with every hope of success and that is *C. eburneum*, a very tolerant species bearing deliciously scented, large flowers ivory-white in colour with a splash of golden-yellow on the lip. Differing from most of the species in the genus, the flowers are produced either singly or in pairs on comparatively short stems.

Although coming, in the main, from the warmer regions of the world, *Cypripediums* make up a large and extensive genus and therefore, as might be expected, there are some native species of the higher and cooler uplands of these regions and from these species come the more hardy plants suitable for growing under cool-house conditions. Coming from the Khasia hills of India one such subject is *C. insignis* which is easy to grow and cultivate. There are several varieties and hybrids of *insignis* but the original type is recommended for our purpose; the colouring of the flower, which is carried on a stiff, erect stem, is a greenish-yellow with brown spotting and the under sepal green. It is probably the orchid flower most commonly known for it is to be seen in most florists windows at some time or other.

The other *Cypripedium* with a suitable wide range of tolerance for the fish house is *C. villosum*, a very free growing plant producing large flowers in January and February the sepals of which are brown with a green band to the dorsal, black at the base. The petals and pouch are yellow-brown with the whole flower possessing a highly polished sheen.

The genus from which we make our next selection is the *Odontoglossums* chiefly natives of South America especially in the higher regions of the Andes although some species are to be found in Mexico. Flowers are borne on long spikes and can number from 4 to 40. There are, however, a few species which have branching of the spikes and will then produce from 50 to 100 blooms. Foremost, for our purpose, is *O. crispum*, a well known and popular species. Although there is some slight variation in colouring of the flowers, depending on the district of origination in its native habitat, the true type coming from the Pacho district is pure white with a slight yellow hue on the labellum. There are several varieties

of this species which can be recommended for trial in the fish house where their flower spikes will certainly provide decoration.

A delightful hybrid which is a cross between *O. crispum* and *O. triumphans* is *O. lochristiense*, robust and possessing a good range of tolerance it is well suited for our purpose. The flowers are orange-yellow thickly spotted with chocolate-brown borne on a long, arching spike and in bloom during May and June.

The care of the orchids mentioned is not difficult for they require no special attention. Watering is important and a certain amount of care is needed. No definite set of rules can be given as to quantity and frequency for this depends on time of the year and weather conditions. More water will be needed by those plants in full growth and flowering than when at rest although even then they should not be permitted to dry out completely. If the weather is dry and warm water is needed in greater quantities than if it is cold and damp. A fair guide is to be obtained by inspecting the moss on the surface of the compost. This should show green and healthy. If this is dry and losing colour then water liberally.

From time to time the leaves should be sponged on the upper and lower parts to keep them free from dust accumulation. Tepid warm rainwater is the most suitable for this direct application to the plants. Dip the sponge and then squeeze out surplus leaving the sponge nicely moist then wipe from base to tip of leaves.

Apart from one or two species, orchids are not, as a rule, quick growing plants so that repotting is not a frequent requirement, therefore, as far as the species mentioned, every two years should, under ordinary circumstances, be sufficient. A mixture of compost suitable for them is fine osmunda fibre and living sphagnum moss in equal parts with a little loam and sifted oak leaf mould added. When repotting use a well cleaned pot, a third of its depth filled with crocks, over which a thin layer of moss should be placed on which to rest the plant and then fill round firmly with the compost mixture, leaving room for about a half an inch layer of living sphagnum moss on top of the compost around the plant.



# *Pseudocordylus subviridis*

by H. G. B. Gilpin, B.Sc.

COMMONLY KNOWN AS the Craig Lizard, this saurian is typical of the rock-dwelling species. The body is extremely flattened, so much so, that at first sight it gives the impression of having recently completed an extended hunger-strike. It is, however, ideally constructed to suit the needs of a rock-dwelling animal accustomed to retreating into narrow crevices in boulders, to escape the attentions of the numerous predators who prey upon members of its order. Its shallow body enables it to penetrate incredibly narrow cracks into which few enemies can follow it.

*Pseudocordylus* is further protected by its colour which merges imperceptibly into its background. Its broad, triangular head and, for its size, powerful jaws, are horn coloured. The ochre patched back and tail are a dark, unobtrusive brown and a wide, ochreous-yellow band extends along the sides. The abdomen is greyish-yellow. The tail, which as a further protection, can be shed in moments of stress, is covered with rough, sharply pointed, protruding scales.

Although not brightly coloured, like some rock dwelling lizards, *Pseudocordylus* has an intriguing appearance and is well worth a place in the terrarium. When newly caught it is, as perhaps one might expect from an animal accustomed in its natural habitat to disappearing with the utmost celerity into some rocky refuge at the first intimation of danger, somewhat timid. It soon becomes reconciled to captivity, however, and ceases to dash madly for the cover of some convenient rock cranny whenever one approaches.

At first sight its somewhat menacing appearance makes one a little doubtful as to the wisdom of handling it with unprotected hands. Any risk in doing so is, I imagine, illusory as on the numerous occasions when I have found it necessary to handle mine, it has, apart from a few preliminary struggles, proved entirely innocuous



and soon settled down. At no time has it attempted to bite. Care should be taken, however, to treat it gently and cautiously, otherwise one might be left holding a portion of tail whilst the lizard disappears into the most inaccessible crack available. The loss of the tail will not inconvenience it but, although regeneration of the lost part will take place, it will never regain completely its former beauty. Also one might experience considerable difficulty in reclaiming the truant.

In view of its relatively huge head and wide mouth (my present specimen, although no more than seven inches in total length, has a head one-and-a-half inches across its widest part) I should hesitate to keep it in the same quarters as smaller lizards. I have found it completely inoffensive and non-aggressive towards lizards of comparable size. For some months my specimen shared its accommodation with a pair of Jersey Green Lizards (*Lacerta viridis*) and an Agama and all four lizards lived together peacefully without the slightest signs of bickering.

*Pseudocordylus*, although normally a somewhat lethargic lizard, is given at times to bursts of activity when it will hurl itself across the whole length of its quarters. In doing so it might well damage its nose against the

glass or some intervening obstruction. Because of this its terrarium should be reasonably extensive. I have found a converted aquarium three feet by fifteen inches by fifteen inches to be quite satisfactory.

I have divided the floor of mine into two parts, one covered with thick, low growing moss and the other with a couple of inches of dry, coarse sand. The variation in texture of these two materials seems to keep the animal's feet in good order. The *Pseudocordylus* uses the two surfaces indiscriminately, if anything rather favouring the moss.

For furnishing, the terrarium is decorated with a few large rocks chosen for their colour, shape or interesting appearance and so arranged to provide little "caves" into which the lizards can retire when so disposed. The *Pseudocordylus* does make use of these retreats if faced with the sudden advent of a stranger but normally spends most of its time in the open. A four-inch diameter earthenware pot of water is sunk in the sand for drinking purposes, its rim reaching some half-inch above the surroundings.

The Craig Lizard is a native of S. Africa and requires a temperature maintained at not less than 70°F. This can be provided quite simply by

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# THE WATER THYMES

by Philip Swindells

THE ELODEAS or Water Thymes must be familiar to the vast majority of aquarists and pond owners, for these prolific growing oxygenating plants are widely commercialised and can always be found in dealers' shops. Unfortunately the genus has recently been subjected to an upheaval in nomenclature and species formerly known as *Elodea* are now reclassified under *Egeria*, *Lagarosiphon* and *Anacharis*.

There are about ten species currently known as *Elodea*, all of which are of North or South American origin; the commonest being *E. canadensis*, the Canadian Pondweed. This is the plant introduced into Europe at the end of the last century, which spread rapidly along canals and waterways making them virtually unnavigable. Fortunately it died out after several years leaving a much less vigorous form in its place. It is believed that the plant originally introduced was the male form, separated botanically at that time as a species, *E. planchonii*, a plant which is now comparatively rare in cultivation. The *E. canadensis* now common in these regions, and the

one of commerce, is usually the female form. This has dark green, serrulate leaves borne in whorls around long branching stems, and tiny floating lilac flowers with long thread-like peduncles. These are only occasionally produced, usually after a spell of warm humid weather, and are water pollinated. Regrettably, owing to the invasive nature of this species, it can only be recommended for the aquarium or pools in which an excess of underwater growth can be easily controlled.

*Elodea occidentalis* has a similar habit of growth, becoming a nuisance in shallow acid water, but more restrained under neutral or alkaline conditions. Its stems are long and slender with whorls of sparsely placed narrowly lanceolate leaves and masses of small nut-like fruits; the latter enclosing extremely viable seeds which contribute in no small measure to the spread of the species.

A native of South America, *Elodea callitrichoides*, is almost identical, except that its stems are much stouter and fruits are rarely produced. This most attractive little plant is currently naturalised in parts of the Home Counties, but is not reliably hardy and therefore more suited to the aquarium than the garden pool.

Although completely hardy, *E. nuttallii* (*Hydrilla verticillata*) always looks its best in an aquarium where it can be viewed from the side. Its delicate lanceolate leaves being almost translucent and borne in dense whorls around the slender much-branched

*Elodea—  
there are ten  
species currently  
known*

stems. This extraordinary plant abhors the presence of organic matter in its growing medium, and is much happier in a stiff clay or gault compost.

*Lagarosiphon major* (*Elodea crispata*), however, does not appear to be too particular as to soil conditions, thriving in the most unlikely of places, and thrusting up long stems densely clothed in broad, dark green, crispy foliage. I would think this is probably the finest oxygenating plant for a pool as it rarely gets out of hand and retains its character throughout the winter.

Almost as popular, but not quite as robust is *Egeria densa* (*Elodea densa*), a frequent inhabitant of both tropical and coldwater aquaria. It looks at first glance like a very well grown *E. canadensis*, but closer inspection will reveal that its tiny floating three-petalled flowers are white and obviously insect pollinated. In common with all *Elodeas* and their allies, propagation is affected by stem cuttings some three to six inches long, held together in bunches by a strip of lead around the base and dropped or planted in the pool or aquarium.

## *Pseudocordylus subviridis* continued from page 683

fixing a 60 watt electric light bulb, connected with a thermostat, to the inside cover of the terrarium. An opaque glass bulb is preferable to a clear one as, although it gives adequate light, it reduces the glare considerably. The animal revels in the heat and spends much of its time pressed flat against a convenient rock, basking in the warm rays.

Although, as is the case with the vast majority of lizards, only live food is acceptable, feeding presents no great problem. Blow-fly maggots are taken readily. If some are left uneaten they pupate and quite soon, at the prevailing temperature, flies

emerge and are soon snapped up by the lizards. Locusts, both third instar hoppers and the fully adult insects, form a popular item of diet and in times of shortage of winged insects the ever useful standby of the lizard keeper, mealworms, form a satisfactory substitute on the menu. Woodlice, although less popular than insects or their larvae, will be eaten when more favoured foods are unobtainable. These are usually easy to find and if placed in the terrarium will form a colony underneath the moss, providing a reserve supply of food against times of possible shortage.

When live food is given quite often the insects will not all be eaten immediately as lizards, unless hungry, normally show no interest in them. Frequently the surviving insects crawl into the water vessel and being unable to crawl out drown themselves. This is a complete loss as the lizards will not feed upon the dead bodies. Prevention is simple. If a stone is placed in the water vessel, level with and touching the rim, any insects, inadvertently submerging themselves, readily avail themselves of the escape route so provided and are available whenever the lizards are again ready to take them.



# GOLDFISH BREEDING

by A. Boarder

## PREPARATIONS

IN THIS FIRST ARTICLE of a series of recommended methods for breeding goldfish I will deal with matters which should be dealt with in order of preference. A good start will usually give better results than if one set about the procedure in a hit and miss manner. If this and the following articles are studied there is no reason why the breeder should not be successful.

There are two main methods of breeding goldfish. The first and probably the more common one is to allow the fish to breed at random in a garden pond. The second is to use a controlled method when certain fish are used and the spawning is only allowed in conditions where results can be estimated with a degree of certainty. When it is intended to breed a special variety of goldfish it is essential to use a controlled method as by this means it is possible not only to make sure which fish have actually spawned but also to ensure that most of the fry are reared in safety.

When goldfish spawn in a garden pond it is often found that few if any of the youngsters are of any value, either as potential breeders for the future or of sufficient quality for them to be retained. The reason is that all varieties of goldfish can breed between themselves and so common goldfish, comets, moors, shubunkins, fantails, veiltails, orandas, lionheads, celestials and bubble-eyes can all breed one with the other. From such a mixture it can be imagined what a large quantity of throw-outs would be produced. One of the worst effects of such indiscriminate breeding could result in many of the young fish never changing colour from the original bronze to the desired red or orange. Many goldfish which are allowed to breed unchecked in a garden pond will produce not only badly-shaped fish but also many which remain bronze. As the latter fish are usually very

hardy, it is probable that they will survive and become more numerous than the good coloured ones, with the result that eventually very few really good fish will be bred at all.

The aquarist who wishes to breed a particular variety of fancy goldfish will be well advised to make sure that he uses a strictly controlled method and so makes certain that whatever fish are produced he knows that they are, at least of the correct stock, and well worth keeping. I might state here and now that good class fancy goldfish cost no more to feed and breed than common types and they will always command a better price. Not that one should think only in terms of finance, as if anyone thinks that he can start in with breeding goldfish and make a fortune in this country, he is very much mistaken. One can, of course, cover the costs of feeding, and also heating, if this is used. It is also possible to make a little pocket money. To expect to make a whole-time living at this hobby is, to say the least, very optimistic.

For those owners of a garden pond who wish to breed something better than the common goldfish, I would like to make a few suggestions as to the varieties which can be tried. In the first place do make sure which variety you intend to breed and then stick to this one only. Do not try to breed several varieties at the same time. It is usually the specialist who gets the best results. It is the same in most hobbies; the man who specialises in one particular type, whether it is fish, birds or dogs, will get much further than the man who dabbles in all kinds but specialises in nothing. This should be obvious but I know from experience that many breeders try to succeed with several types but fail in all.

The breeder who wishes to control his spawnings may be fortunate enough to own a fish-house. This will make the special pairing of certain

fish much easier than if one had only the pond. However, just because one has no fish-house it does not mean that it is impossible to breed with particular fish. Once fish are spawning in the garden pond it is easy to catch up a particular pair or more and place them in a large tank where it is certain that whatever fry are produced they will only be from those particular fish.

Because female goldfish are not in fact able to lay eggs previously fertilised by a male fish, this means that whichever fish are caught and placed in a separate container, they and they alone will be responsible for the fry when hatched.

If one is not sure which fish are males or females it is often a better plan to wait until the fish are actually spawning in the pond before any are taken out for controlled breeding. With some varieties and strains of fancy goldfish it is not always easy to sex the fish. When they are in breeding condition the males will show the small white, raised dots on their gill plates and often on the front rays of the pectoral fins. This is not always apparent with some strains. I have also heard that some females can show these spots, and whilst I have never seen such a thing I am in no position to say definitely that this is incorrect. One point which is easy to see and which should never fail is that the female is fatter in the belly than the male. When trying to sex fish one should only put together those of the same variety. They should be placed in a bowl and examined from above. The female will show up fatter than the male providing, of course, that the fish are in good healthy condition. This swollen belly of the female is usually quite noticeable during the winter providing the fish have been reasonably well fed and looked after during the previous summer and autumn.

It would be of little use trying to sex veiltails and common goldfish together by the above means as the former would have so much fatter bodies than the latter that any comparisons would be useless. It is often recommended to separate the sexes for a time before commencing breeding operations, but I do not think that this is necessary. If fish are kept in tanks this can be done but

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# EXTRA TIPS ON SETTING UP AQUARIUMS

by D. B. Easingwood

THE FOLLOWING ARTICLE is intended as a help to aquarists setting up a decorative community tank. It does not include the more normal guides found in aquarium books, like lighting heating, aeration, water, type of community fish and plants, etc. I feel that aquarium books deal with these subjects adequately. I hope the article will be useful as an extra guide, based on experience, in setting up your aquarium.

The importance of leveling your tank correctly cannot be overstressed, especially for tanks bigger than 24 x 12 x 12 in. Although never having the experience myself, I can imagine the mess and frustration caused by glass cracking and emptying gallons of water onto a living room carpet. 10 minutes spent with a spirit level checking the tank in ALL directions is well worth while. Remember a 36 x 12 x 12 in. aquarium weighs approximately 250 lbs. and contains roughly 15 buckets of water which could cause some havoc! After levelling the tank, check for possible leaks. Firstly feel the putty and make sure it is still soft so when the aquarium is full of water, the glass will press into the putty, thus closing up any spots that opened while the aquarium was empty. If the putty is hard, don't chance having any trouble, get it re-glazed immediately. Then to save any further trouble I go right round the INSIDE joints, especially at the bottom, applying "Hykro Leak Stopper". This looks like black bitumen and has to be left to dry overnight. After applying the leak stopper to all joints I have had no trouble with leaks. Be warned, take the trouble to prevent leaks BEFORE filling the aquarium. It is no use trying to cure a bad leak from the outside, it just won't work. There is nothing more frustrating than setting up the gravel, rocks and plants, then filling the aquarium with water, finding

a bad leak and having to start all over again and I speak from experience!

Gravel is not just something to cover the bottom of your aquarium and set the plants in. Used together with the rockwork to good effect, gravel can make the difference between a good and a bad aquarium. Firstly try to obtain lime-free gravel. This is dearer than normal gravel but in the long run will be of greater benefit to fish and plants. Any lime present in the aquarium will, in time, harden the water. So the initial extra cost is worthwhile in the long run. Always thoroughly wash new gravel, no bought gravel is clean enough to put straight into the aquarium. Clean a handful under a fast running tap, preferably hot, for 2 or 3 minutes to get it really clean. A good idea is to use some coloured gravel in with normal gravel. At 1-lb. coloured gravel would be too dear to use on its own but sprinkled on top of normal gravel gives a beautiful effect. About 2 lb. for a 36 x 12 in. aquarium is plenty. Another useful tip is to have about 5 lb. of gravel ready to put around the plants after the initial planting; an extra spoonful around the plants will help keep them planted. This will prevent the frustrating experience of setting up the aquarium and finding half the plants floating next morning! Don't use any lead to weigh down the plants. Although less trouble, lead has the effect of strangling the plant when it grows. So don't be lazy in taking the easy way out, it isn't worth it in the long run because the growing capacity of your plants will suffer. Besides, using lead weights is cheating!

After experimenting with different rockwork for 5 aquariums I have come to the conclusion there is only one type for me: COAL.

In my first aquarium I tried quarry hardcore of the type used for road bases. Some of this was quite good, especially the grey-green type

(Quartz) but the red type (sandstone/clay) gives off a dye when immersed in water and rubbed with the finger. Hardcore isn't very easy to shape but is very cheap.

Next I tried marble and granite chips obtained from a stonemason's yard. I found owners very helpful to give me rocks they had discarded and none wanted any payment. The trouble with the chips was that they were either rectangular blocks cut and polished or flat, hand-size chips, and as the marble and granite is very difficult to cut, I found it hard to get the shape I wanted.

I tried rough-cut slate brought from the Lake District but this again was difficult to cut; if you have good cutting facilities, slate would make ideal rockwork.

Then I found my ideal material for rockwork, in the form of coal. After cleaning off the dust it is amazing how clean and sparkling coal is. You can cut and fashion it easily to any shape you want. It is very decorative and provides a lovely contrast with the green of the plants and colours of the fish. Coal comes in any size and is, of course, very cheap. Any aquarist who buys decorative rocks is, in my opinion, either mad, has too much money for sense or is too lazy to find novel ways of aquascoping his aquarium. One material I have yet to try which could give a better centrepiece than a large plant is WOOD. I believe most woods are unsuitable as they foul the water in time but a gnarled branch or log taken from a peat bog could look fantastic.

Experimenting with different types of rockwork has given me a lot of pleasure and I still strive for the ideal.

Once the tank is level, leakproof (we hope!), the gravel clean and rockwork decided upon, I find it best to try and draw a picture of the 'Aquascope' I want. You need basically:—a focal point (a large plant, rock, piece of wood, etc.) in the aquarium with the rest of the rocks, plants and gravel blending in with it. Also your aquascope should be of the right depth. My pet hate is to see an aquarium with a 15-18 in. depth with only 2 or 3 in. of rocks and gravel which leaves the aquarium looking bare. I try to fill  $\frac{1}{2}$  to  $\frac{3}{4}$  depth with rocks and gravel at the back and slope this down level with the angle iron at the front. This makes a steep slope and has the advantage that any surplus food, dead leaves and



water will collect at the front of the aquarium making it easier to siphon out.

Another aspect to consider when planning your aquascope is COLOUR. Some tanks I have seen look very dull; brown gravel, grey rocks, a few plants and undistinguished fish. A community aquarium should be a thing of beauty: lots of green plants, bright rockwork in black (coal), red (hard-core), blue (marble) contrasting with shoals (say 6) of different coloured fish. For example: red (Wagtail Platies, Red Swords), black (Mollies), orange (Schuberti Barbs), silver (Red Eyed Tetras), blue (Neons), etc. The permutation of colour in any aquarium is endless.

A tip when filling the aquarium: a lot of books suggest placing paper on top of the gravel and then pouring in water on top of the paper to prevent disturbing the gravel but there are

better ways. I fill my aquarium by placing a bucket on a piece of glass or board across the top of the aquarium. Then I fill the bucket with water and start a syphon with a piece of air tube. This fills the aquarium nice and slowly and its best advantage is that you can be doing other things in the meantime. All you have to do is to occasionally top up the bucket. If you are using tap water for the aquarium, turn the tap on full and fill your container as quickly as possible. This helps to drive off some of the gases, like chlorine, found in domestic water supplies. If you can, add some distilled (obtained by boiling tap water) or rain water to the tap water, about 25% (1 to 1½ buckets for a 24 × 12 × 12 in.). This will help to soften the water and will benefit fish and plants.

Lastly, a word on lighting. When the aquarium is completed, leave on

the light for 48 hours continuously. This draws the plants upwards and helps them settle in quicker. The type of lighting to be used is sufficiently dealt with in good aquarium magazines and books but one particularly beautiful form is 'Grolux'. This is an ultra-violet type of light costing approximately £4. It brings out the reds, blues and greens in the aquarium to great effect but should only be used for short periods as it has a tendency, in my opinion, to make plants brittle. If used as an extra light, using white light to grow the plants, it is well worth the money. To soften the glare one gets with white light, use floating plants like Water Hyacinth and Water Lettuce. This will make the fish feel a lot more comfortable and they will colour up better. They also prefer as dark a bottom as possible.

## GOLDFISH BREEDING

continued from page 685

with most of the hardy types of goldfish varieties it is better to see that the fish have a rather cold treatment during the winter months. They appear to breed better when they have been subjected to low temperatures during the winter. It is said that certain species of fish will only breed well when they have had such cold treatment in the winter. While I would not go so far as to say that goldfish are in this class, I certainly think that cold treatment in the winter helps to get the fish in a better condition for breeding in the following spring.

Having decided on the type of fish to breed the next step will be to get the fish one has chosen to breed. This may not be easy but if one looks around at the shows and the results it is usually possible to find out who has the best fish of the variety chosen. Do not be too particular in the first place. There is so much more satisfaction in breeding up your own strain than you could get by paying a large price for show specimens in the first place. You are more likely to be able to buy reasonably shaped fish from a good strain at a fair price, and if they have come direct from a well established strain it is probable that

even if they are not actually show specimens themselves, it is possible for them to breed such fish.

I stated earlier in this article that I would give a few suggestions as to which varieties are suitable for the pondkeeper to try. Obviously if no fish-house is available and it is not easy to provide some warmth for the eggs and fry, one must stick to the hardier varieties. These are the common goldfish, comet, shubunkin, fantail and lionhead. It will be realised from this list that the types with rather long or flowing finnage have been excluded. This is because such fish are rather liable to contract fin congestion and other troubles.

The fortunate owner of either a fish-house or the means of providing some warmth can breed such varieties as veiltails, veiltail moons and orandas. The celestials and bubble-eyes can also be tried. I have made no mention of pearl-scaled fish as I consider that this is not a valid variety, as I see no reason why these curved scales cannot turn up in any of the hard scaled types.

I have a garden frame, 20 feet by 7 feet, in which I have electricity installed and so it is easy to provide extra warmth and aeration if required. Concrete tanks, which have been described in a previous issue, are used. These are ideal for hatching and rearing tanks, but if one does not like the work involved in making

them, it is quite easy to buy cheap containers for the purpose. The plastic washing-up bowls which are sometimes on sale at department stores for about two shillings each are very good, or better still the plastic baths as used for babies. The advantage of such containers is that they are cheap, easy to clean and are not too deep. Too much depth is not only unnecessary but the water in such tanks is not as well oxygenated as it would be in a more shallow container where more water is in contact with the atmosphere.

There is no special treatment for the prospective spawners at this time of the year. There is no need to feed on any dried foods but an occasional garden worm (broken of course) or some white worms will be of help to keep the fish in good condition. See that the water in the tanks of fish under cover is kept in good condition. Each week some of the water should be changed for fresh, about a sixth part is usually enough unless the water looks or smells impure. No water plants and base gravel need be in the tanks. I use Hornwort (*Ceratophyllum demersum*) alone, as this plant makes no roots and so requires no base compost. This enables one to clean the bottom of the container much easier than if gravel was used.

My next article will deal with further instructions preparatory to the actual breeding.



# OUR READERS WRITE

## All-Glass Aquariums

I would like to have the opportunity if I may, of answering Mr. Derek Bevan's letter criticising my comments on all-glass tanks. I suppose it is partly my own fault that I was laid open to criticism by not clarifying my mode of construction of the all-glass tank which met with such a disastrous end.

At the time I was comparing prices of various types of aquaria, and I decided to build an all-glass tank to establish its cost in relation to other aquaria. The glass I used was ordinary  $\frac{1}{8}$  in. polished glass as commonly used in framed aquaria. I used this in preference to  $\frac{1}{4}$  in. plate glass as the latter costs three times as much as the former. If I had used the expensive glass (plate), the all-glass tank would have cost more than a conventional plastic or nylon-coated framed tank and so would have defeated my purpose of building an inexpensive marine aquarium.

Certainly one can build an all-glass tank using  $\frac{1}{4}$  in. plate but not ordinary glass, but why bother? It is far easier and less trouble as well as being generally cheaper to buy a plastic coated aquarium. Mr. Bevan also criticised me for putting my aquarium in the garden in order to fill it. However, contrary to Mr. Bevan's assumption, I did not put the aquarium on a rock garden but on a large piece of wood, covered with several sheets of newspaper and the whole was positioned on an absolutely level concrete path.

In conclusion I would like to state that plate glass aquaria can be built using rubber sealants but their cost is higher than a conventional framed aquarium. I would also like to say that I am pleased someone has written criticising my articles. At least it proves that they are being read, if not necessarily agreed with. I apologise to Mr. Bevan for not stating my case more clearly but I hope any future

letters Mr. Bevan writes will not be quite as aggressive as his last one or at least one correspondent to this magazine will be rather frightened about expressing his opinions in print, for fear of being pounced upon!

Yours faithfully,  
TREVOR WILD.

## *Barbus barbatus barbatus*

I would like to comment on the letter appearing in November's issue on classification. It seems to me that it would be far less confusing if all barbs were known as *Barbus*. It is only a very small minority that require such specific names and is certainly not a subject that in my opinion can "mar" an article. I, and I am sure many others will agree, will still call barbs *barbus* and not either *Penfices*, *Capocta* or *Barbodes*, for the widespread use of these names will result in confusion.

Yours sincerely,  
S. R. WINTER.

## Penfriends Required

I am a regular reader of the *Aquarist* magazine which is made available at the British Council Library, Colombo. Unfortunately, vandals invariably remove the pages with the coloured photographs from back numbers as these issues are borrowable by the members.

As I am a keen aquarist as well as a philatelist I shall be much obliged if you will publish my name and address in your magazine requesting correspondence with penfriends in any part of the world who are either aquarists or philatelists, or both. I have already written to a few aquarists who have requested penfriends through your columns but have heard from only one so far. I shall make it a point to reply to ALL letters received. Correspondence in English only please.

I am 31 years of age and a Medical Laboratory Technologist by profession. I am a qualified Pharmacist too but do not practise as one! I rear only fresh-water and brackish-water tropical fishes. Ceylon has many beautiful fish in rivers, streams and, of course, the sea. As my aquarium consists of over 50 tanks I do not find much time for philately and so have confined myself to collecting First Day of Issue Covers and used stamps of new issues.

I hope my request for penfriends will meet with much success.

Yours faithfully,  
ERNEST BEAUCHAMP,  
No. 2, First Lane,  
Rawatawatte,  
Moratuwa,  
Ceylon.

## *Monodactylus sebae*

Early in the new year, a study of *Monodactylus sebae* is going to be undertaken at the Study Centre. Only these fish (not the Malayan Angel) will be dealt with, and therefore it would be of great help if any readers would answer the following questions and send them to me. They only need put the question number and then the answer. Any further correspondence will receive a prepaid reply envelope. Even if this fish has only lived a very short time, an answer to any of these questions could be helpful.

1. Was the fish in a quiet, secluded situation, or living room?
2. Was the water salt, brackish or fresh?
3. How many of these fish were there?
4. How many of any other fish were there?
5. Was it more than 2 inches vertically?
6. Was it a brown, silver, or white between the vertical black lines?
7. Was it brown, reddish brown or silver near its upper and lower tabs?
8. Did it tend to keep its leading edges, bent back, straight, variable?
9. Were the black lines clearly defined, ragged, faint, variable?
10. Was the mouth dull brown, dull white, white?
11. Was the stomach normally well-filled, thin, in line with body shape?
12. Was the tank less than 24 in. x 12 in. x 12 in.?
13. Was the tank well planted, sparsely, no plants (living)?
14. Was the tank set up with rocks and plants?
15. Was the tank always well lit, poorly lit, occasionally well lit?
16. Was the water temperature maintained at 65-70, 70-75, 75-80 degrees?
17. Was the PH known?
18. Was the DK known?





19. Was the water, still, moving, or constant or regular water changes?
20. Was a filter used?
21. Was ordinary gravel used?
22. Did the fish (*sebae*) remain in one part of the tank?
23. Did it prefer a position among rocks, plants, open area?
24. Did it chase other species of fish?
25. Was there an Amazon Sword or other broad-leaved plant in the tank?
26. Were there rocks for it to hide behind?
27. How long did it live? If more than one, try to answer all these questions for each *sebae*.

28. Did it appear to do well at first, then stop eating?
29. At what time of the year was it received?
30. If it lived for more than six months, were there any seasonal tendencies?
31. What was your reason for wanting to keep this fish?

There are other factors which will be taken into account, but they will follow on from these. The results will eventually become available to any society when success has been achieved, and either a film, slide, or lecture depending on response can be assured. Depending on this response, a further research into this unknown world will be made available in the same way. If there are any ichthyologists or other interested bodies studying along similar lines, I feel sure that much could be gained by contacting all societies through *Aquarist*.

Yours sincerely,  
D. PRATER.

#### Find the Fish

This letter is intended as a warning to other aquarists who utilise the rectangular type, plastic bottom filters. I

installed two 14 in. filters on the bottom of my 36 in. tank. On top of them at least 1½ in. of gravel was placed. The tank was then stocked with fish and plants, and the filters used regularly. Recently I lost a Silver-tipped Tetra and had given it up for dead when, while looking at the filters through the bottom of the tank, I saw it trapped in between the filter and the glass. I immediately uprooted the plants, removed the gravel and released it.

Just how it got there is still a mystery as the fish was about 1 in. long and the only possible solution is for it to have gone down the pipe through which the bubbles rise, but even this means that it has an almost impossible 90° turn at the bottom. The fish is now alive although a bit thin through not being fed for several days.

The moral of this letter is therefore this: If you use these filters either put a piece of finly-holed plastic over the tube (e.g. from a tubifex feeder) or stock the tank with large fish which cannot enter the tube. If you do neither of these and lose a fish, then just take a look at the filter through the bottom.

J. WATSON.

## WATER LOBELIA

by B. Fry

THIS LITTLE-KNOWN submerged plant, formally known as *Lobelia dortmanna*, inhabits non-calcareous waters from Wales northwards and is becoming increasingly difficult to come by in cultivation or in the wild. The arching leaves are almost cylindrical in shape and attain about ½ in. across by some 3 in. to 4 in. long. They form neat rosettes of bright green, that remain in character throughout the year. From about the end of June nodding two-lipped flowers are raised several inches above the water on leafless, swaying stems. These dainty little flowers are of a delightful shade of pale blue. Flowering continues over several weeks.

Water lobelia hardly ever fails to prosper if it is prised out of its muddy bed (it colonises in deep and shallow

water) and replanted in the aquarium or garden pond. But it settles down fastest in soft, clear water under a strong light. Although it is essentially a plant of mountain lakes and

moorland pools, it is in no way particular about temperature and will stand a reasonable amount of heat, provided the change is brought about gradually.

## Find the Plant

by Doreen Thiel

- The first is in ARRIVES but not in DEPARTS
- The second is in BILLIARDS and also in DARTS
- The third is in ANKLE but not in KNEE
- The fourth is in SLEIGH but not in SKI
- The fifth is in STRAIGHT but not in NARROW
- The sixth is in THRUSH and also in SPARROW
- The seventh is in TEN and also in NINE
- The eighth is in BEER and also in WINE
- The ninth is in THIRD and also in THREE
- The tenth is in TWIG but not in TREE

Answer page 704 The last is found in ABUNDANCE.



# JUNIOR AQUARIST

## THE EEL

by Jack Hems

A LETTER FROM A YOUNG aquarist (Master C. S. Kay, of Bolton-le-Sands, nr. Carnforth, Lancs.) requesting some information on the care of the eel (*Anguilla*) in the home aquarium has set me thinking of the time, some thirty-five years ago, when I also kept an eel as a pet. This eel came into my possession in a most surprising way: it just wriggled out of a soggy parcel of fresh herrings left unopened on the kitchen table while other shopping was being attended to.

That the eel, as a young eel is properly called, had escaped the notice of the busy fishmonger was not difficult to understand; for it was little or no larger than a very ordinary garden worm. Apparently it had slithered out of the eel-tray wedged between the boiled shrimps and the smoked haddock and come to rest among the staring-eyed herrings.

Without any waste of time Jimmy, as we came to call our adventurous eel, was plopped into a bowl of water. Later that day the bowl was furnished with a thick carpet of washed sand and a scrubbed red tile. At this point I should like to mention that a metal bowl such as this one was, should be avoided as a home for fish; for, generally speaking, metal in contact with water poisons fish. But as I had no other receptacle available, and, fortunately, the metal bowl I pressed into service was one of the good old-fashioned kind, with a thick layer of white enamel covering its entire surface, there was no danger of the eel dying of metal poisoning.

Feeding Jimmy was no trouble at all. In the main worms, red meat, and strips of raw fish made up the bulk of the food offered. But very soon we

discovered that cooked spaghetti, smooth green caterpillars, woodlice, and the like, were all accepted with relish. We also discovered that a cover for the bowl was necessary; for Jimmy often made unexpected leaps out of the water. So my mother cut a square from a piece of white muslin and weighted the corners with heavy glass beads. This simple yet effective cover kept Jimmy in his place. And because the loose-woven fabric let in plenty of air, and no uneaten food or dirt was permitted to stay and decay on the sand, the water remained clear and wholesome.

Before long Jimmy became quite tame. When we removed the cover, preparatory to dropping in food, he would swim out from under his tile (eels are unhappy unless they can hide away from a bright light) and move his head searchingly about the surface. He would take food from our fingers and even permit us to stroke his sides.

However, there came a day when it was decided that it was not kind to keep so large an eel (Jimmy trebled in size within the space of a year) in so small a container; so one balmy afternoon in early spring he was tipped out of the bowl into a large can and carried to a lake in the centre of a beautiful South London park. There, when no-one was about, he was given his freedom.

We can learn a lot about the eel by observing its behaviour in the aquarium, but just how much do we know about the life of the eel in the wild? From all that we can gather from authoritative sources the European eel (*Anguilla anguilla*) and the American eel (*Anguilla rostrata*) have a common breeding ground deep down in the Atlantic Ocean roughly south of Bermuda. But there are those who argue that adult eels from Western Europe could never make the journey of some three to four thousand miles and therefore spawn somewhere in the Mediterranean. Be this as it may,

one thing does seem certain, and that is that once eels have spawned they die. For large eels have never been caught (up to now, at any rate) heading back to freshwater.

Baby eels are known to science as *Leptocephali*. These *Leptocephali* or leptocephalids are glass-like in appearance and narrow leaf-shaped, long ovals pointed at both ends. They feed on the microscopical life that abounds in the sea. As they increase in size they move more and more into the upper layers of the water. Also, they swim instinctively towards land. Remarkably, the *Leptocephali* of the European eel swim towards Europe; the *Leptocephali* of the American eel swim towards America. But here again the plausible theory has been advanced that in all probability millions of leptocephalids of American parentage are swept to Europe with the Gulf Stream.

As the leptocephalids approach coastal zones they assume a yellowish coloration and a cylindrical shape. And when they swarm into the rivers in the spring as eelers they measure from about 3 in. to 7 in. in length. Eels remain in freshwater for several years and during this time may attain a length of 5 ft. or more and weigh upwards of 8 lb. They are not fastidious about the quality or type of water they live in. But whatever its condition (excepting water too polluted to support higher forms of life) they will do well, growing apace on a diet of almost anything found in or entering the water. Large eels have large and muscular jaws and can tackle prey covered with fur, feathers or scales, or even with a smooth, moist skin, like that of a tender young frog.

As soon as the mature eel becomes charged with the desire to find a mate and raise a family the colours on the back and upper sides and in the pectoral fins darken to a blackish hue, and the lower sides and underparts

become more shining and bright. Another thing, the snout becomes more pointed and the eyes become enlarged. Thus, enveloped in a new livery and slightly changed in shape, the eel starts off for the sea. To reach this the eel will struggle and strain to overcome all obstacles in its path. Eels that have spent the

greater part of their lives in ponds or lakes will wriggle overland to reach running water.

Eels are among the best of fish to eat. They are nourishing and easily digested. And they lend themselves admirably to the culinary art. Chefs in the big hotels know more than a score of ways to prepare them for the

table. English eels are said to be superior in flavour to eels found on the Continent. Large quantities of eels used to be, or maybe still are, imported into England from Holland in the season, which extends from August through to the following spring. An eel has lived for 90 years in captivity.

## WATERLIFE PESTS AND FRIENDS

by Bill Sims

### The Water Measurer

THOSE SLENDER HALF-INCH-LONG creatures that frequent the still water of ponds during the summer, congregating in tiny swarms on the water near plants, are usually *Hydrometra stagnorum*, with the common names of Water Measurer or Water-gnat.

Sometimes they appear on cold-water aquariums, usually when above-surface foliage is present. Normally they are of no harm to fishes, but the smallest fish fry are in some danger, for these little water-gnats are suckers of animal juices.

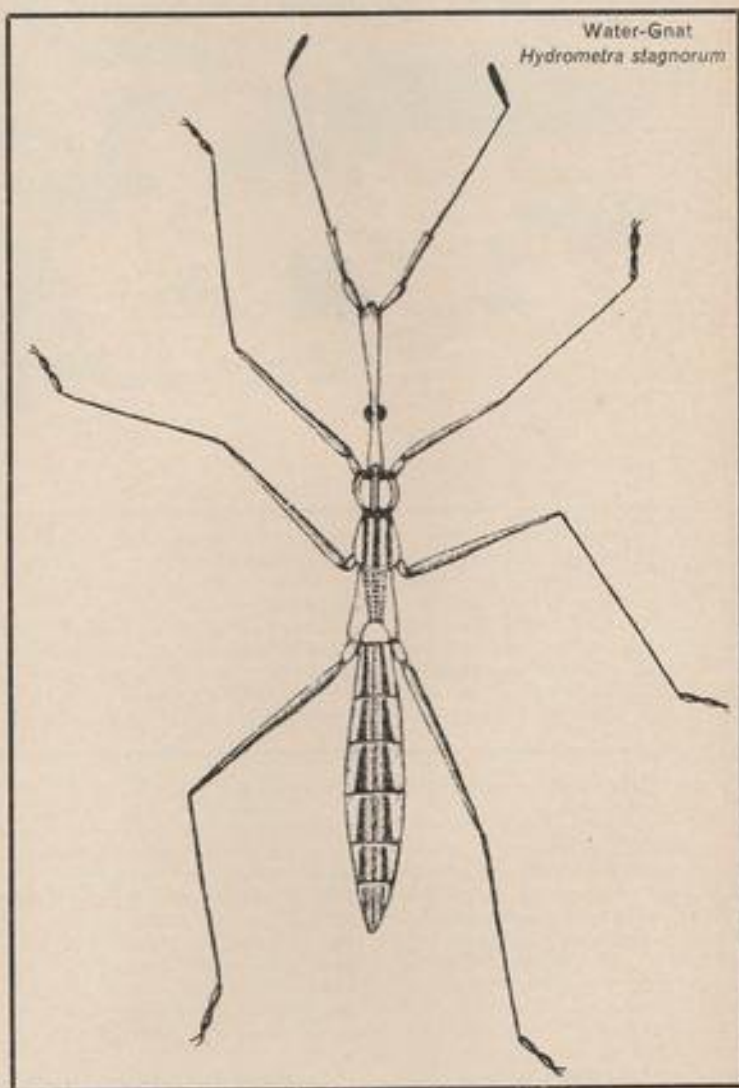
Water Measurers are bugs, and belong to the same family as the bed-bug, and many hundreds of similar creatures. The mouth takes the form of a long beak adapted for piercing the victim's skin, be it animal or plant. The upper lip is slightly elongated, and with the grooved lower lip constitutes a most efficient sucking instrument.

Strangely enough, since it mainly lives upon water, the Water-gnat is a land bug and its use of the water is confined to running about on the surface film, for there it finds the bulk of its food. Minute water creatures that reach the surface are attacked as also are any that fall on to and/or float along the surface.

Land bugs have long antennae, whereas water bugs have short ones. This possibly reflects the amount of use to which they are put for in water the vibrations and odours must be more in contact than in air.

Water-gnats mate in early summer and the female lays her eggs on vegetation above the water line. All bugs have what is called an incomplete metamorphosis, and the water-gnat

Continued page 692



Water-Gnat  
*Hydrometra stagnorum*

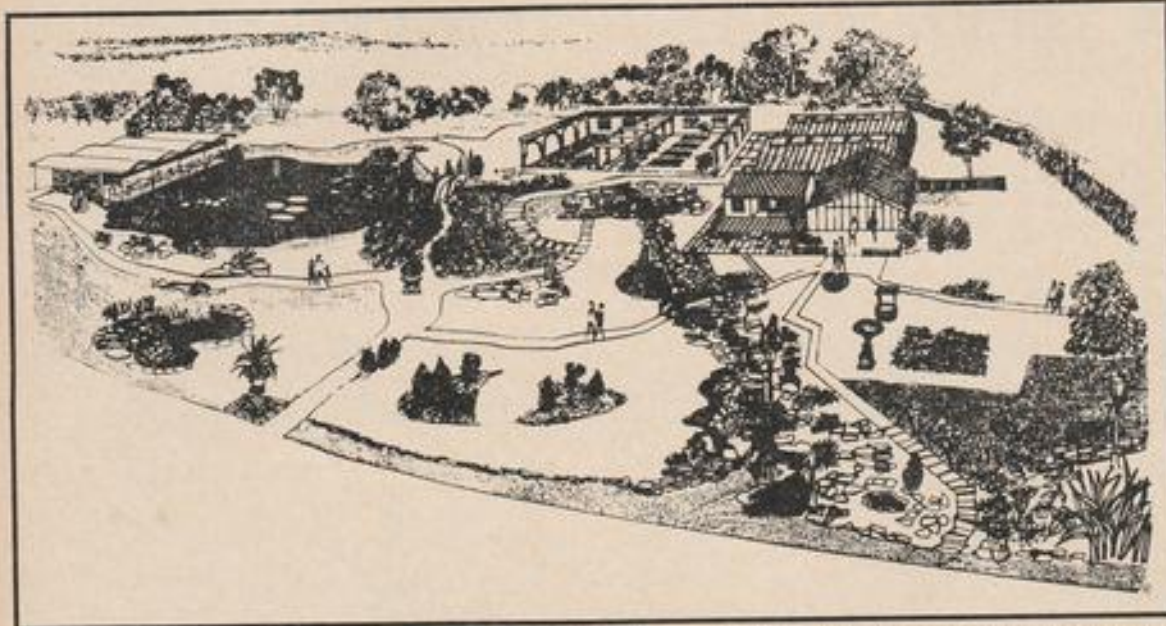


# EUROPE'S FIRST WATER GARDENING CENTRE

aquatic plant varieties, fancy fish strains and decorative pool accessories that are now available.

The Stone Organisation has set the situation to rights with the opening of Minster Water Gardens Ltd. The beautifully landscaped water-gardening centre includes 5-acres of pools, cascades and covered showrooms. Indigenous aquatic plants and fish are bred and reared in the Centre's 5-acre

active pools and cascades, and other ancillary equipment. Minster also operates a scheme tailored for beginners whereby they will supply a balanced selection of either fish or plants to suit any given size of pool. By stocking with Minster speciality selections, the hobbyist avoids the risk of installing groups of either fish or plants which are harmful to each other. And, of course, the selections



THE FIRST WATER GARDENING centre of its type in Europe has opened in Southwell, Nottingham. The vogue in water gardening has increased to a terrific pitch over recent years but until now no landscaped garden layout has existed to enable hobbyists to make a visual selection to suit their own tastes from the thousands of

lake and special breeding tanks and others from Minster's huge selection are imported and hardened-off before being made available.

All types of aquatic plants and fancy fish are available, either direct from the Centre or by delivery, together with a full range of garden ornaments, fountains, pumps, decor-

include oxygenating plants to aerate the water and scavengers to guard against fouling by decaying matter.

An afternoon at the Minster Water Gardens will reveal a comprehensive selection of the equipment available to the water gardening hobbyist all beautifully landscaped in natural settings.

## Waterlife Pests and Friends continued from page 691

is no exception for the larvae are something like their parents. At each moult (about five in all) they become more nearly like the adults. These creatures mature quickly for there are usually two generations each year.

Normally the adults spend the winter under stones near the water's edge and I have found them in such positions in January. They must be in some form of cold-induced hibernation for on bringing them into the

warmth of a tropical fish room they have soon shown signs of movement. Some "hibernating" water-gnats that I placed on floating leaves in a tropical fish tank revived within three hours, and were soon darting about the surface. Not quickly enough to avoid some large cichlids, however, for I saw one water-gnat caught and consumed and very soon there were none.

An aquarist who wished to keep and

study these small creatures should make a cover of fine netting to enclose the upper portion of the tank, for some of the adults have wings while others have not. I suspect that these wingless ones are immature—perhaps through being hatched out too late in the year. But we do not have enough information on this sort of thing and some research of this sort is admirably suited to the amateur naturalist.



# THE BARBUS QUESTION

In the November 1968 "Our Readers Write" column, Mr. H. R. Coles takes Mr. Parry (and presumably "The Aquarist" as well) to task for the use of certain cyprinid nomenclature. Mr. Coles is obviously a bright lad but the subject is, alas, not quite as simple or as cut-and-dried as his "Occam's Razor" approach would have it.

Enclosed is a short article dealing with this problem that was published in "Tropicals" magazine in December 1961. The situation has not changed since then and the material is still topical. Because "Tropicals" had such a small circulation, the material is all but unknown even in this country. I hold all the rights to the publication of this material, by the way.

Accordingly, I invite "The Aquarist" to publish this article in the hope that it will answer critics such as Mr. Coles who are not aware of the complexities involved. The article, incidentally, represents the vast majority thinking of America's most distinguished ichthyologists.

Albert J. Klee.

FOR A NUMBER of years, aquarists have been plagued with the uncertain taxonomic status of the genus *Barbus*. Since this problem is one of the most difficult and confusing in the whole of ichthyology today, aquarists have not been the only ones so plagued. There is hardly an ichthyologist who has dealt with barbs from the three continents of Europe, Africa and Asia, who would not agree that these fishes comprise more than one genus . . . the controversy is over what should be done about it. Historically, a number of ichthyologists working in restricted geographical areas have subdivided *Barbus* in accordance with the apparent requirements of the geographical area of interest. Thus, Drs. Myers and Oshima subdivided *Barbus* in China and Formosa; Boulenger in Africa; and Weber and de Beaufort in the former Dutch East Indies (Borneo, Indonesia and Singapore Island). The last-named attempt was rather successful, resulting in the widespread use of the genus, *Puntius*, both in the scientific and aquarium worlds. German aquarists, in particular, were quick to adopt *Puntius* for all aquarium barbs, and the practice was introduced into this country mainly via the efforts of

H. R. Axelrod. This was and still is, however, a highly indefensible practice.

Although the Weber and de Beaufort system was used fairly successfully by Dr. Hugh Smith for the barbs of Thailand, other ichthyologists found difficulty in applying these (Weber and de Beaufort's) criteria in their own areas of interest. Thus Hora, the Indian ichthyologist, continued to recognize *Barbus* in his papers on the freshwater fishes of India, and no ichthyologist working with African barbs has chosen to abandon *Barbus* there. In short then, the practice in ichthyology has been for those dealing with Indonesian and Siamese fishes to use *Puntius* reverting however, to *Barbus* for European, African and other Asian barbs (we are, of course, simplifying matters considerably by restricting discussion so far to *Barbus* vs. *Puntius*). Those aquarists lumping African barbs, for example, under *Puntius* are making an egregious error, indeed.

A number of years ago Dr. Schultz, writing in the *Tropical Fish Hobbyist* magazine, stated that aquarists should use the following three genera, based mainly upon the number of barbels: *Capoeta* (2 barbels), *Puntius* (no

barbels), and *Barboides* (4 barbels). We strongly advise against this. This system is open to considerable criticism (which is too technical and involved to discuss thoroughly here) and at best, is quite premature. Dr. Schultz seemingly has ignored the real problem with *Barbus*, that of the evolutionary considerations within this great group. It will take more than an article in an aquarium magazine to untangle the confusing phylogenetic lines involved. So far as barbs are concerned, we quote Dr. Myers on this: "It seems almost certain that the reduction or loss of one or both pairs of barbels has occurred independently in different evolutionary lines, and may thus be of no importance in establishing genera defined solely by such losses".

The ichthyological world is sorely in need of a revisional work on *Barbus*, based upon thorough and intelligent study of both external and internal anatomy, together with studies on geographical distribution. It seems probably the case that such a study would show that the number of present species should be reduced, that in reality, many existing "species" are merely subspecies. Such a study would involve a tremendous number of fishes, not merely a handful of the 400 or 500 "species" now chronicled.

So far as the aquarium world is concerned, it is recommended that *Barbus* be utilized for all aquarium barbs until that time at which ichthyologists have produced a satisfactory revision (aquarists should expect a long wait!). Aquarists are not ichthyologists and therefore are hardly justified in using the specialized nomenclature of *Puntius* (et al) in the case of Indonesian and Siamese barbs. It would only complicate matters since the use of *Puntius* is definitely not justified for African and other Asian barbs, in any case. The terms, *Capoeta* and *Barboides* should be dismissed.



# Miller's Thumb or Bullhead

by Andrew James

*Cottus gobio*, otherwise known as the Miller's Thumb or Bullhead, makes an excellent addition to the mixed cold-water aquarium.

They are fairly undemanding and peacefully disposed to reasonably sized fish, though they eat fry avidly and for this reason they are persecuted in trout-breeding streams where they do a great deal of damage to the fry and sometimes the eggs. Once the bullhead gets to know its owner it becomes quite tame.

At first sight bullheads resemble the *Plecostomus* catfish having elongated almost cylindrical bodies with large heads. Their large mouths with broad lips give them an almost comical look. The colour varies greatly according to the intensity of the light and the colour of the back-

ground into which they try to merge, but it is usually an irregularly mottled brown. The undersides are pale grey with a tint of blue here and there. Scales are absent except for a single line of specially modified ones along the lateral line.

Their comical appearance is further emphasised by the very large pectoral fins upon which the fish appear to lean and thus keep their heads off the bottom. The second dorsal fin extends to the single caudal.

Bullheads are to be found throughout Europe, Siberia and Asia Minor in clear streams and lakes. In a few cases they are also to be found in brackish water. In Britain they can be found in almost any stretch of water, but are far more plentiful in fast-flowing stony streams and rivers.

In the higher mountain streams there is another species called *Cottus poecilopterus* which is just a smaller version of the bullhead. All of the specimens that I have caught were under rocks in a small fast-flowing stream also inhabited by gudgeon and sticklebacks.

Catching them can be very difficult but I have found that the best method is to gently lift the rock, and if there are any underneath attempt to catch them with two nets—it is practically impossible to do it with one. However, if the fish gets away it is not worth following it—they are far too quick.

These fish take very well to aquarium life once their initial shyness has been overcome. It is, of course, necessary to imitate their natural environment as far as possible by providing them with stones and hiding places.

After a few weeks they will emerge at feeding time. They eat almost anything, freshwater shrimp (*Gammarus*) and bloodworms being favourites. Unfortunately the males are very quarrelsome at spawning time and so for that reason it is safer to keep fish of approximately the same size. However, they will not attack a fish of another species that is of a moderate



Below left: Their large mouths with broad lips give them an almost comical look

Right: Bullhead or Miller's Thumb, showing ability to merge with gravel background

size compared with their own 3-4 in.

The males can be distinguished by their brighter colours and very distinct protruding genital papilla. The breeding season lasts from February to July.

Spawning freshly caught fish is quite easy. The male courts a female and eventually drives her to a pre-chosen spawning site where about 100 eggs are laid in small orange clusters. The male then defends these eggs and they hatch after 4-6 weeks depending on the temperature.



## DANGEROUS FISH BAN AT PET SHOPS

Extract from  
Beckenham Journal  
Kent

LOCAL PET SHOPS are being asked not to sell an exotic, colourful breed of tropical spiny fish, known as scorpion fish, because of the possible danger.

Many of the 25 types of scorpion fish are poisonous. They include the world's most venomous fish. The risk to pet-lovers who may buy the fish has prompted the borough's Chief Public Health Inspector, Mr. J. C. Kermode, to ask the Health, Welfare and Children Committee to prohibit local pet shops from the sale of these fish.

In his report to the committee when it met on December 11th, Mr. Kermode said there was a potential risk to anyone, especially children, who might attempt to interfere with such fish after purchase.

Under the Pet Animals Act, 1951, the Council grant licences to pet shop proprietors and can specify special conditions to be observed.

### Main Object

The main object of the Act was to ensure that pet shop animals—the term includes all vertebrates—were well-cared for on licenced premises. But a Health Department spokesman said that the conditions of licence could be extended to protect the public as well as safeguard the welfare of the animals.

In his report, Mr. Kermode quoted information from the British Museum's Department of Zoology: "A sting from the spines of a Pterois (scorpion fish) would undoubtedly give rise to great pain, together with other unpleasant effects, although in most instances where records are available the individual has eventually recovered."

"The effects on young children and very elderly people might well be more severe, and it is not possible to say categorically that death would not occur, although this would probably be exceptional."

### Sale Withdrawn

Mr. Kermode added that the topic also gave rise to the thought that there

might well be other kinds of fish or reptiles on sale, either now or in the future, which have a venomous sting or bite.

The Health Department spokesman told the *Kentish Times* that they had already discovered one pet shop in the area where scorpion fish were being sold.

"When the proprietor learned of the potential danger he agreed not to sell any more."

The Health Department were trying to find out whether any other shops were selling the fish, he said.

A spokesman at the London Zoo said scorpion fish were a group of tropical fish found in the Pacific Ocean and other parts of the world. They included the world's most venomous fish.

The venom was in glands along the spines near the head of the fish. Contact with one of these had never resulted in death, although there were several recorded cases where the results were almost fatal.

The committee gave Mr. Kermode the authority he requested. When a member suggested that the order should be extended to prohibit the sale of certain other creatures, the discussion was postponed to the private session.



# MARINE NEWS & VIEWS

by Trevor Wild

SINCE THE BIRTH OF this feature in the October issue of this magazine, I have received many letters from you and I would like to thank all of you who wrote to me and also those who read this column.

The diversity of the topics discussed in the letters has astounded me and has led to the setting up of a number of experiments. But more of this later.

Certainly one of the most interesting letters I received was sent from Barbados in the West Indies. The author was a gentleman named Ed Pearson, and his letter made me green with envy. The reason for this display of human weakness is a very good one as Ed is a marine collector and exporter to the States. In his letter he tells me the fishes he collects include rock beauties, French angels, queen triggers, blue and yellow tangs and longnose butterflies as well as such "commonplace" specimens as beau gregories and jewel-fish. If Ed happens to be looking for a partner for his firm, "Barbados Aquariums", I'm first in the queue of applicants! He also contributes a good piece of advice on the subject of aquarium covers. Of course the first function of a cover on the tank is to keep the inmates inside, but Ed gives another equally important reason. Ed puts it so well himself it only suffices me to quote from his letter.

"Keeping marine aquaria under glass covers can reduce or almost eliminate loss of expensive synthetic sea salts or natural salt content. From my past experience, I have found that filters and airstones actually splash tiny particles of the salt solution over the sides of the aquarium resulting in a loss of saltwater. This is especially noticeable when tanks are filled within a few inches of the top. Whilst this is happening, we are also losing distilled water through evaporation which varies according to the humidity

of the room in which your tank is located. If one is marking the original level of the water and topping up with fresh water, in time the specific gravity will become dangerously low.

"It was concluded that the glass cover almost eliminated salt loss while at the same time evaporation of distilled water was cut by nearly 90 per cent." I hope this will induce those marine aquarists who do not have glass covers on their aquaria to remedy this omission immediately, even if only for the sake of economy. At the present prices of these synthetic salt mixes any salt loss however small costs a few pence. Now on to the experiments I mentioned earlier. Another letter I received was from Mr. K. A. Sullivan, on the subject of plants in the salt-water aquarium. Mr. Sullivan has had success recently with the keeping of sea lettuce (*Ulva* sps.) in his marine aquarium. His secret is the use of diffused natural daylight for long periods. Unfortunately my aquaria do not have access to natural light and so strong fluorescent lighting with a natural tube seemed to be the answer. Sure enough algae grew rapidly and the removal of exchange resins and ozoniser accelerated the plant growth with the effect that the corals and shells in this tank now have a thick covering of yellow, brown and bright green algae. The corals now have a very natural look and some fingers even look alive. Brine shrimp introduced to the tank have thrived and attained gigantic proportions and have even laid eggs, the offspring of which are growing rapidly. Mr. Gerald Jennings of the International Marine Study Society also has had this type of aquarium in which the filtering system has been sub-sand filters. I have installed these filters in the algal-covered tank and the water is crystal clear and the aquarium looks far more attractive with green corals, and what is more, the filters mentioned are much cheaper than power filters and an ozoniser.

This method christened the semi-natural method by Mr. Jennings is sure to be the most popular to the beginner, economically and aesthetically.

On the subject of sub-sand filters: an account I read recently related the tale of a tank which had these filters and contained various trigger fishes.

One of these characters burrowed down to the filter and proceeded to bite lumps out of it. The article however suggested that a thick layer of sand would discourage if not eliminate such mining activities.

Certain generic names have been changed recently which appears to have confused some aquarists. So, to put the record straight, *Balistapus* species (Triggers), are now correctly known as *Rhinocanthus*. The damsels previously called *Pomacentrus* should be called *Eupomacentrus*, and the angel fishes referred to as *Angelichthys* in my article which appeared in the July issue are now scientifically classed as *Holocanthus*. However, the old names will probably be the more popular ones, at least for the time being.

Once again thank you for all the letters I have received. Keep them coming in, as this column depends on your ideas.

## Construction Details for a Carrying Case

by E. Seal

JOINTS IN PLY can be as shown on plan, mitred or even butted. All must be glued. Also panel pins, if needed at corners and base.

All the internal partitions should be fitted dry prior to gluing up.

All other parts are glued. (Including insulation board to lid.)

Fine sandpaper over in final stages with attention to all corners and edges.

Fit carrying handle, hinges, catches and then take off.

External finish in Cuprinol furniture stain. Then final coat in Cuprinol Evenseal or any similar types of finish.

Replace carrying handle, etc. once again and tighten up.

Allow finish to dry, then you are ready for your show jars.

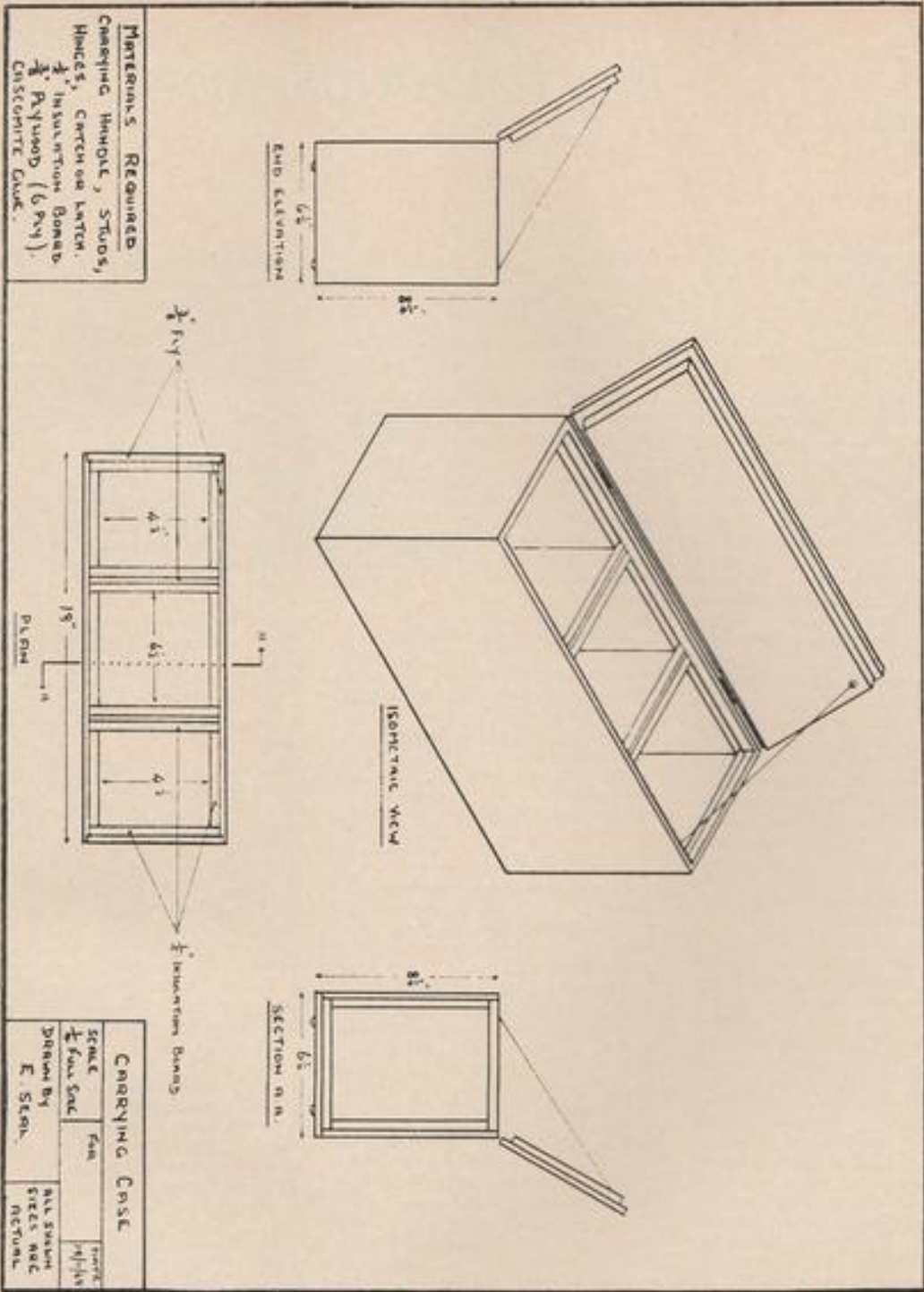
### Cutting List

$\frac{1}{2}$ " PLY AS PER PLAN  
2—18" x 8 $\frac{1}{2}$ "  
2—6" x 8 $\frac{1}{2}$ "  
1—18" x 6 $\frac{1}{2}$ "  
2—5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ "

### INSULATION BOARD

2—17 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ "  
6—5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ "  
6—4 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ "

# CARRYING CASE





# OUR EXPERTS' ANSWERS TO YOUR QUERIES

## COLDWATER QUERIES

by A. Boarder

**I would like to breed some goldfish next year. Can you please tell me how to feed the fish in preparation and when to start pairing off the fish?**

I know of no better food for conditioning fish than the ordinary garden worm. However, do not try to feed the fish in the winter at all unless the temperature of the water is of a warmth to make the fish move around well. During most winters there are periods when the weather is quite mild and the fish will be on the move. This is when a little food can be offered. Just drop a piece of worm near the fish and if it is not taken quickly, give no more. When the water is cold the metabolism of fishes becomes very sluggish and any food taken will not be digested for some long time. Most fish we keep in ponds can go for long periods without food when the water is very cold. If food is given and not eaten the water can soon become polluted. Pair up the fish in April.

**I had two goldfish in a bowl and one died. Do you think the other one will mope because it is alone?**

The fish will not be any the worse for being alone. Goldfish do not seem very intelligent and yours will no doubt grow better with more space. However, it would do much better in a properly set-up tank or aquarium, with growing water plants.

**I am planning to make a garden pond and would prefer to use concrete. Would you please tell me the advantages or otherwise of plastics versus concrete?**

A concrete pond is harder to make than one made with Butyl sheeting. The price might be more for the latter, but the pond could be made and stocked much more quickly than if concrete was used.

**I have bought a large Mirror carp, about two pounds in weight. My problem is what to feed it on?**

These fish will eat any food as taken by goldfish. A good variety of dried and live food will suit this fish. Try the usual pond-fish food and add rolled oats, dry brown bread, garden worms and any other live foods you can find. This fish is not at all fussy over food.

**I have recently made a pond and stocked it with goldfish. There is a laburnum tree very near the pond. Will the leaves and flowers be harmful to the fish if they fall in the pond?**

I would try to keep the flowers and leaves from sinking in the pond by netting them out as often as possible. The seeds of the laburnum are deadly poisonous and so you must try to keep these out.

**I read in certain books that the Tench (*Tinca tinca*) is referred to as the Doctor fish. Why is this and is there any truth in the statement?**

The tench used to be so described as it has a lot of mucus on it and this was supposed to be beneficial to others. There is no truth in this. The tench is a good fish for a pond and is often recommended as a good scavenger. This is so but the goldfish is just as good a scavenger if it is not over-fed.

**How often should I feed my fish in the garden pond?**

I presume that you require information for winter feeding. If the fish are goldfish they will not need hardly any food at all throughout

the winter. You can rest assured that they will come to no harm if they get nothing from you from December to March. A lot will depend on the state of the pond. If it is fairly well stocked with plant life the fish will no doubt find any food they require from among these plants. Although many pond plants die down during the winter the fish appear to be able to find at least enough to keep them going until the early spring. A lot will depend on how well they were fed on the approach of winter. You may take it as certain that the colder the water the less will your fish require in the way of artificial feeding.

**I have just bought a tank, 18 in. x 12 in. x 12 in. and have planted it with 40 cuttings of *densa*, 6 cuttings of *ludwigia*, a small spatterdock and 8 *crispa*. Is this enough planting for the tank?**

If the cuttings all grow you will have a tank full of plants and no space for the fish in which to swim. Most water plants soon grow in the correct conditions. You could have had at least a quarter of the plant life but a lot would depend on what type of compost you have at the bottom of the tank. A little loam under the gravel at the back of the tank helps plants to get established in a newly set-up tank. Once fish are providing some nourishment for the plants by their droppings a healthy growth of plants results.

**I have five perch in a fair-sized pond. I have heard that such fish are carnivorous and would like to know if this is so as I wish to breed from them?**

Perch are carnivorous and can eat any fish up to half their own size. They can even swallow sticklebacks, spines included. Perch could be bred in a pond but they require plenty of garden worms and other live



The Tench is recommended as a good scavenger

foods. They are one of the earliest British coarse fish to spawn.

**I have a Peacock bass which is in my garden pond. Can it stand the cold of the winter?**

These fish can stand plenty of cold as long as the pond does not freeze over almost solid. If it is possible to have a tank heater, either 100 or 150 watt, just to switch on in very cold weather, this would keep a small hole open in the pond when the rest is frozen over. Even one hole can allow the dangerous gases to escape and also let fresh oxygen into the water. These fish eat mainly live foods but some can be accustomed to forms of dried foods.

**When is a coldwater tank overcrowded with fish?**

The usual rule is to allow 24 square inches of surface area to each inch of fish. When making this measurement, ignore the tail. More fish than this can be kept in a tank if aeration is used but with even this the fish will not thrive and grow as well as if they had more space in which to swim.

**I was interested to hear on television recently the item about making garden ponds with plas-**

**tics. Is there any literature on the subject which I could get please?**

The book entitled "Garden Ponds" by Arthur Boarder, and published by Foyles at 5s. gives all the necessary information on making such ponds together with instructions on stocking, maintaining, etc.

**Do goldfish require as much food in the winter as they do in the warmer weather?**

Goldfish are cold-blooded creatures and take their body temperature from the water. They lose their appetites when the water gets cold as it takes them longer to digest their food in such conditions. Goldfish will sometimes take garden worms even when there is ice on the pond. However, they do not require feeding once the temperature of the water falls below 50°F.

**I have bought three lots of nymphs and each time they do not live long. I have put them in a pond with goldfish which appear to be quite healthy and I have not lost one of these. Can you say why this is?**

It is quite possible that the nymphs had been bred under warm conditions and then when they were

placed in your pond the sudden change of temperature upset them. When buying any type of goldfish, especially the fancy ones, it is a good plan to ask the dealer if he knows under what conditions they have been bred and kept. If the fish were imports it is probable that they had been reared under tropical conditions and so when they were placed in colder water they soon died. If you must buy such fish see that they are gradually acclimatised to the new water by lowering the temperature of their water until it is nearer that of the pond.

**Would it be advisable to buy eels from a fishmonger to put in my pond? I have other fish in the pond.**

The eels could eat or damage some of the other fish in your pond. They have very sharp teeth and if a fish was too big for them to swallow they could take a nasty bite at them and could kill them. Eels sometimes travel over-land during wet nights and so if you introduced eels to your pond they might soon escape if conditions were not to their liking, or should I say it, when they had eaten all the other fish?

**I have an outdoor fish-pond. Winter will soon be here. How can I keep the water from freezing solid? If it did do so would the fish live?**

I do not know the winter temperatures in your district, Ohio, U.S.A., but expect that the water could freeze almost solid, but there is usually some water at the bottom of the pond which does not freeze. You could keep part of it open by using a tank heater of about 150 watt. This need only be switched on during severe weather. The small hole formed above the heater would be enough to allow fresh oxygen to reach the fish, which could then survive.



## OUR EXPERTS' ANSWERS TO YOUR QUERIES

continued from page 699

### TROPICAL QUERIES

#### What is a porthole fish?

The porthole fish is a livebearer which is seldom seen in dealers' tanks today. Its scientific name is *Poecilia latipinna*. It is indigenous to the fresh waters of southern Mexico and Guatemala. It is a silvery olive fish. The male is smaller than the female and has several black spots in a line, like portholes, along the sides. The female attains a length of about 2 in. and is hardy and prolific. The species makes an attractive addition to a community tank.

#### Could I use sulphuric acid to acidify the water of my large aquarium in which I keep a number of angel fish?

Sulphuric acid is quite safe to use to lower the pH value of the water, provided you do not overdo it. Take out about a half-pint of the aquarium water and stir into this a tablespoonful of the acid. Introduce small quantities of this made-up solution into the aquarium every so often. After adding the acid solution always agitate the aquarium water without scaring the fish, and take a reading of the pH value with a pH testing kit obtainable from any well-stocked dealer.

#### What makes the most satisfactory substitute for a giant vallisneria or an Amazon sword plant as a spawning ground for Angel fish?

Among the best substitutes are fresh sedge leaves or the leaves of the yellow flag or the Siberian iris weighted to the bottom. An old dodge is to run green paint inside

narrow glass tubes, and after this has dried and the tubes have been soaked in several changes of water, arrange them in the aquarium to resemble upright reeds.

#### Can you tell me anything about an aquarium plant called the water chestnut?

The water chestnut belongs to the genus *Trapa*. There are several species of *Trapa* distributed over large areas of the temperate and tropical world. The European species is called *T. natans* it is becoming increasingly rare. The leaves are triangular, with serrated edges, and float at the surface. The stems that support the leaves have swollen petioles or green bladders. The edible seeds are quite large and are armed with a few hard spines. The numbers of spines differs in different species. Many of the peoples of Asia use the seeds of the water chestnut as food. One can buy tinned water chestnuts in Chinese provision stores. Because of its scarcity, the water chestnut is seldom seen in the aquarium today. In Victorian times it was a popular aquarium plant.

#### I have seen some bizarre-looking tropicals which my dealer tells me are called *Sternarchus albifrons*. Are these fish easy to keep and where are they found and to what length do they grow in the wild state?

*S. albifrons* is an unaggressive knife fish popularly known as the black ghost in the U.S.A. It will eat anything alive or dried and is not faddy about the quality of its aquarium water. As it attains a length of 12 in. it does need plenty of swimming space. It is found in tropical America.

#### Is there anything I can do to stop a large male swordtail attacking its companions in a community tank? I was under the impression that the swordtail was a good mixer.

Occasionally a male swordtail will develop into a persistent bully. You cannot change the nature of a bullying fish but you can see that its rushes are impeded by thick planting. Also, you can see that its companions are not the kind likely to be worried by its behaviour. As a last resort, you can always remove the fish from the tank.

#### A local stonemason has lots of marble chippings. Would these be too coarse to serve as a planting medium?

Keep marble out of the aquarium. Its effect on water is to make it excessively hard and alkaline.

#### Would it result in waste of money and time to include plants in a tank destined to accommodate a pair of *Pelmatochromis kribensis*?

Provided the fish are well-fed and the plants introduced have sturdy foliage and a strong rooting-system everything should turn out all right.

#### A biology student has told me that fish fill aquarium water with poisonous waste products and that the only way to avoid trouble is to change the water at frequent intervals and to keep a filter working continuously. Is this right?

In a well-planted aquarium, not overstocked with fishes, and siphoned periodically to get rid of excessive sediment, the water should stay wholesome enough to maintain the general run of fishes in good shape for years. At the present time too many people are trying to persuade us that old-fashioned methods of fish-keeping do not work. Yet the truth is that they do—and remarkably well at that.

#### My aquarium is leaking along the front edge of the frame. I have tried to seal the cement showing on the outside with added aquarium cement and paint, but the tank still leaks. Can you tell me whether there is any simple way of sealing the tank from the inside without emptying the water away and applying one of the new rubberised sealants along the bottom where the glasses meet?

Mop the water away and make a mental note of the area where it is oozing out. Having done this, rake the compost away from the glass and drop some pellets of ordinary yellow clay into the channel formed before raking the compost back to its former position. The clay will disintegrate and work into the cement. Leaking should stop within a few days. If this treatment proves successful, follow up by spreading Uhu glue or a quick-drying paint along the exposed cement edge.



# WATER PROBLEMS

by F. L. Vanderplank

THE HOBBY HAS been expanding rapidly during the last year and as we generally follow the trends of the U.S.A. usually one or two years behind we are only just starting, to judge from what a member of the trade there tells me. During the last year I have met with many cases of enthusiastic beginners buying a selection of tropical fish, taking them home (often I regret to say without having previously set up a tank and allowed it to settle and the water to mature for at least three days prior to adding any fish), and rapidly filling their tank, adding hot water to get the temperature correct, then putting the fish into the water only to find all or most of the fish dead within 12 hours. I can imagine if any "old hands" are reading this that they are saying to themselves, serve them right, since they must have been warned by the retailer of what would happen. To the beginner, water is just water, but to the more experienced of us water seems to be more of a problem the more we study it. Some areas are fortunate and have good water and it is easy for authors in such areas to say: "disregard all that which is written about pH, hardness and salinity, just use good clean water". What is good clean water? As a trained chemist and biologist and one who has been able to study natural sources of water over most of tropical Africa and here in England, one begins to realise that good clean water is a rare commodity. Many authors will tell you that fresh-water tropical fish will tolerate a wide range of salinities, hardness and pH and I know this is true, but it must be qualified. The majority of tropical fish sold by retailers are either wild fish caught in their natural habitats in the tropics or fish bred in more or less natural surroundings in the tropics. Fish like Cardinals, Neon tetras, Black tetras and others can only be bred in very soft acid (pH 4.5 to 6.0) water and these fish often suffer a high

mortality rate when imported, and even higher if retailed quickly after arrival. The clear drinkable tap water if brought to the correct temperature should be all right for any fish; that is how the logical but inexperienced person thinks. Piped or tap water in this country is in the most populated areas generally very hard, which is a way of saying that it has a lot of calcium bicarbonate and/or calcium sulphate in solution. Calcium bicarbonate is dissolved chalk, limestone, marble or similar mineral and calcium sulphate is plaster of paris. Nearly all fish breathe through gills which are a mass of small tubes with blood circulating inside and the water outside, and are used by the fish to extract oxygen from the water and carbon dioxide and other waste materials from the blood. The membranes that separate the blood from the water have very special characteristics since they are very selective in what they allow to pass in and pass out. A fish reared in soft water, that is water without any appreciable calcium or magnesium, is unable to cope if suddenly placed in hard water and these gill membranes are damaged to such an extent that they allow the essential salts from the blood to escape into the water and the fish dies within hours. Practically all fish can gradually be adapted to live quite satisfactory in hard water and once they have become adapted they can generally stand considerable and sudden changes. But it is not just a question of hardness of the water that kills so many fish; most tap water is chlorinated and many supplies are fluorinated as well. Although we have got used to this and only notice it when for some reason or other it is excessive, even when it appears chlorine-free to us, fish unaccustomed to chlorine and fluorine in the water die for the same reasons as given above for calcium. This is why it is so important to allow tap water to stand for two or three days to permit the free chlorine to combine itself with other minerals in the water or escape into the air. As with calcium, fish can adapt themselves to chlorine and fluorine if accustomed to it slowly over a period of time, a process that has to be carried out with young fish bred in this country. I lost 3,000 two-month-old fancy goldfish and nearly 2,000 two-month-old silver angels early in 1968 due to giving too much clean tap water in one go; in actual

fact it was only 50 per cent of their water but it proved fatal to them within 12 hours. This led me to carry out some experiments on what was the best thing to do in an emergency like this. Placing them in clean tap water just finished them off quicker than ever. Returning them to old mature water would save them, but invariably one hasn't got the old mature water to transfer them to. The solution is fairly simple and should have been obvious to me in the first place and that is to add good quality charcoal to the water which absorbs (not really the right word for it since it is a rather complicated chemical process) the offending gases and since then I have been able to save a lot of young and older fish when their water has become polluted with gaseous substances, in some cases due to algae (dying and liberating sulphur dioxide) and in others due to gases liberated by bacteria due to carelessness or overfeeding. However, one has to be careful since some packets of specially prepared filter charcoal have been soaked in chemicals, probably sodium carbonate (soda) and is very caustic (pH 10.0) and although it may be quite suitable for use in filters as intended, the increased alkalinity caused by the chemical is only making matters worse in circumstances where the fish are dying from polluted water and I find that ordinary clean charcoal free from any ash is the best in these emergencies. The charcoal can be washed in tap water before use if there is any doubt. This does not spoil its efficiency since it acts as a catalyst. Charcoal can be used to make tap water safe if it is wanted in a hurry, about a handful to every 30 gallons is quite adequate.

## Catfish for zoo

Extracts from the Northamptonshire Evening Telegraph

THE SELANGOR AQUARISTS' SOCIETY is sending six rare species of catfish, found in Malaysian waters, to the London Zoo soon.

The society's president, Mr. Douglas Lee, said today the fish—known as *ikan sambilan*—were meant as a gesture of goodwill as well as to acquaint Westerners of the type of fish found in local fresh and marine waters.



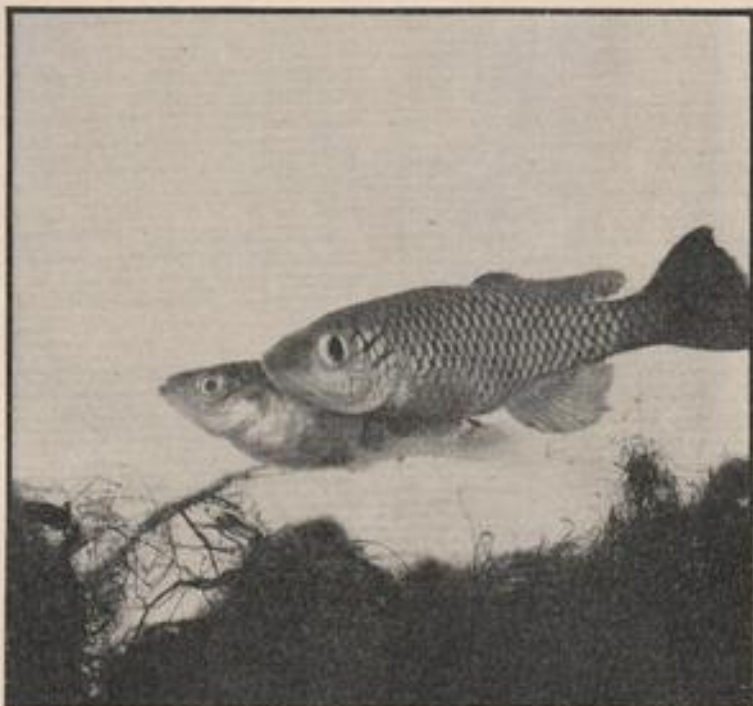
# Nothobranchius palmquistii

by Karl Knaack

THIS BEAUTIFUL VARIETY comes from East Africa. It was introduced to us for the first time in 1958 and grows to about 5 cm.

For keeping this fine variety small containers of 5 to 10 litres capacity are sufficient. For breeding I generally take two females and a male. In a glass bowl of 10 litres the bottom is covered up to a level of 3 cms. with well-boiled and washed peat. *Nothobranchius palmquistii* is a ground-spawner, which when mating sinks its spawn into the ground but does not penetrate into it itself.

The process of spawning is the following: the male swims for some time after the female, but if the latter stays still for a moment the male places himself immediately at her side and displays with fins widespread. Then swimming backwards and forwards continues during which the male tries to swim over the female in order that his throat may touch the back of his chosen one. The male rides in a slightly sunken attitude so that he can influence the direction of swimming of the female with his pectoral fins. The male presses down continually upon the female and pushes himself at the same time forward until he reaches the back of her neck and head with his throat. This contact exercises upon the female a stimulus to spawning. When the ground is reached the partners swim backwards and forwards for some time until the female is prepared to spawn. In the actual act of spawning the male presses the female right down to the spawning substratum which can consist of peat or sand. There the male tries to embrace the female with his dorsal and anal fins and hold her to the ground. Both partners remain for some seconds in this position and then the laying of eggs on the part of the female takes place with much trembling and the simultaneous fertilisation by the male. With a strong stroke of the tail one egg at a time is



sunk or thrown into the spawning substratum. This process is repeated as long as the supply of eggs in the female lasts.

*Nothobranchius palmquistii* is a permanent spawner, that is to say the fish spawn right through from the 18th day of age until the last. It is therefore advisable to arrange some intervals for rest from time to time so that the fish can recover.

After every encounter the fish are separated for about 8 days. During this time both sexes are well fed in order that spawn may be formed in the female. Then the encounter begins again.

I generally put the fish together for 14 days, then take the peat away, pour

Above: The male swims alongside the female

Top right: The male rides over the female

And tries to press her down to the nest

it into a fine net, and then press it out so that it is only slightly damp and falls apart crumbling. This is then kept in closed plastic bags and stored at a temperature of 18-20 degrees. After three months time I shake the peat with the eggs into a plastic bowl with softer water of about 6 degrees hardness. After some hours the first larvae are hatched. At first the larvae wriggle up to the surface of the water which should not be higher than 5 cms.,

otherwise the larvae through an excessive effort of strength may not reach the surface, which they need to do without fail for filling their swimming bladder with air. From this time onwards the young fish then swim horizontally around in the water and can be fed.

The bringing up of the young ones is not difficult. The larvae after hatching are 4-5 mm. long.

As the first food I give them cyclops and after 8 days grindal worms. From that time onwards the young fish grow very quickly. At only 18 days the young fish can begin spawning. They have by that time reached a size of 2½-3 cms.

From one spawning, as described above, 200-300 young fish can easily be hatched; it is necessary in the course of the first three weeks to sort out the young fish according to size, as otherwise only some, and those the strongest, will survive. This is because, as in the case of many other varieties, the stronger young fish eat up their younger brothers and sisters.

Good food and frequent partial changing of the water are very advantageous and hasten the growth of the young fish.

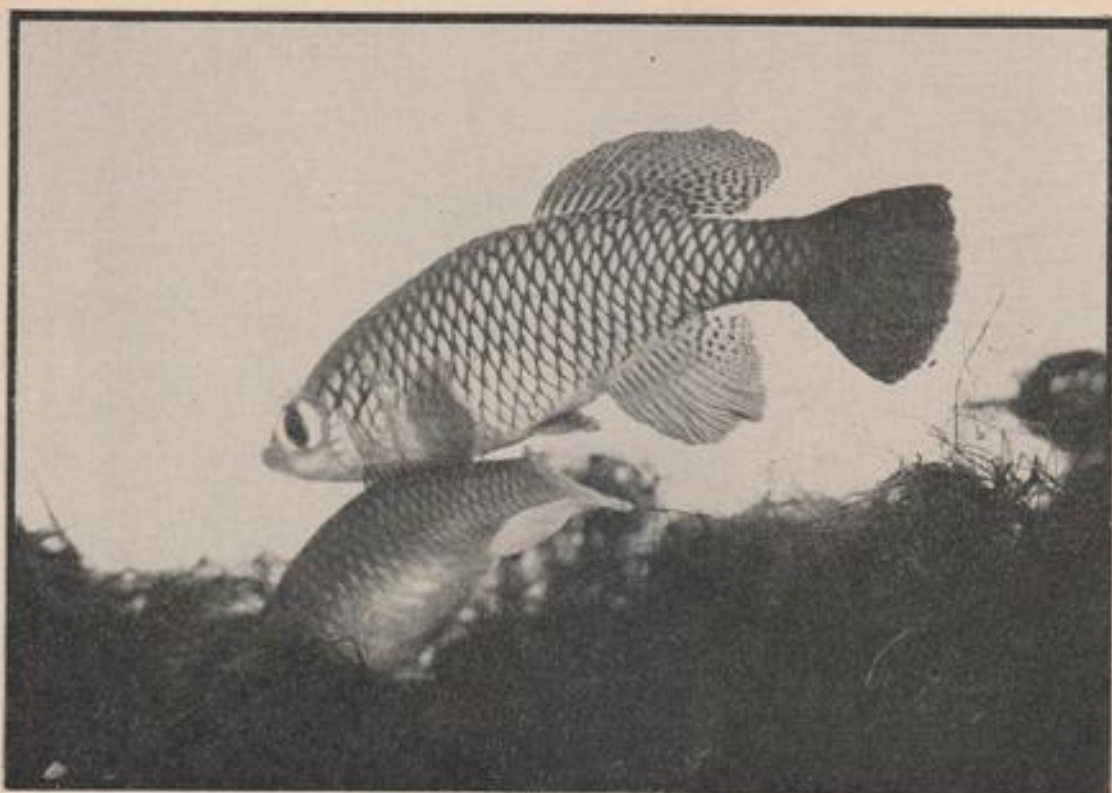
The *Nothobranchius palmquistii* makes no particular demands as to the nature of water but for breeding it is advisable to use some softer, slightly sour, water filtered through peat.

For spawning a hardness of about 2-4 degrees is advisable. Gradually, by the addition of fresh water, the hardness can be increased to about 8-10 degrees.

If *Nothobranchius palmquistii* is kept cool (I mean at about 18-20°C) it can easily live to 2 years of age, although in places where it is found it has to end its life after a few months through the drying up of the pools in which it lives. There it spawns in the muddy bottom which is then completely dried up and new life begins again only after the first rain. Then the larvae hatch







out in masses. The rhythm begins again. *Nothobranchius palmquistii* is a small fish which can be recommended to every lover of egg-laying toothed carps. Unfortunately it has been very strongly cross-bred with *Nothobranchius gouthieri*, as both these varieties can easily be cross-bred. The two varieties should, however, be kept separate and bred separately. Crossbreeds should, without fail, be designated as such when they are sold.

The female is ready to spawn and burrows into the peat

Left: Now the male presses down the female deep into the peat in order to spawn with her

**solution to  
"find the plant"  
on page 689  
*Vallisneria***

# BERGEN'S AQUARIUM

by Susan Lester

BERGEN'S AQUARIUM, WHICH cost about £200,000 to build, has the advantage of being part of the Institute of Marine Research in Bergen; in fact, the two buildings are one in that they share pumps, piping, reservoirs, gravity tanks, heating and cooling systems. Also, while the idea is to interest lay people in the marine life around Norway's coasts, it is intended that research should be carried out at the same time.

The Aquarium has three main sections: the first shows fish families and animal communities, the second deals with animal organs, marine species and specimens, and the third emphasises habitats.

Situated on the coast, right on the Nordnes peninsula in Bergen's harbour, close to a site where witches were once burned, the Aquarium has the advantage of direct fresh sea water supplies. The deeper sea water in this part of the harbour is unpolluted and as the water is taken from a depth of 438 ft., below the thermocline, temperature and salinity are constant throughout the year.

Water is delivered to the Aquarium's reservoirs from five pumps with a capacity of 100,000 gallons per hour, placed at zero level. The submarine pipelines are of polyethylene submerged by lead weights. All tubing in the building is of rigid PVC material. No filters are used in the sea-water system but each reservoir is divided into three compartments to allow both flotation and sedimentation. Fresh water taken from Bergen's chlorinated tap water has to be filtered and conditioned. Here filters consisting of layers of stone wool, gravel, activated charcoal, marine mussel and shell fragments are used. Sea and fresh water at 5°, 10° and 20° C. are always available, with adjustable heating and cooling systems to give lower or higher temperatures. In 24 hours, 3,000 tons of water passes through the Aquarium.

In the first section of families and communities, they tell you about the cod family, describing how gourmets like the cat-fish and ballan-wrasse catch their food. The latter is very adept at de-spining sea urchins against rocks, breaking the shell, and sucking up the contents providing no cod comes along at the big moment. We also learn about the power of the lateral line, or early warning system in cod and saithe, enabling them to tell if noises in water are boats, herring, seal or just waves.

"Beneath the Wharf" introduces the delightful habits of, for example, the lump-sucker and his mate. He looks for somewhere to lay eggs, cleans the chosen place, "blowing" away loose debris. Then he fetches his wife to inspect his work, which she does, only to find fault with it and seek another place herself. His task is to dissuade her and make her lay the eggs in the place he has chosen. This she eventually does and swims away leaving him to pack the eggs into their "nest" tightly before he fertilises them. Then he guards them, blowing water through them. You may have tasted Scandinavian caviar? Well, it is none other than the poor lump-sucker's eggs!

"On the Sandy Bottom" you have to be sharp to spot even the eye of the flat-fish. With luck you may see the courtship dance of the Dragonet. Usually it is just the male showing off, but in May she joins in.

Difficult as it is to keep sprats, herring and mackerel in an aquarium for several years, they have done so in Bergen. You see them in the Pelagic fish, which include Brittle stars and lugworm.

Sea anemones, sea cucumbers, sea urchins and Spotted gobies make a fine underwater flower show.

"From 200 metres Down" we see red-fish, which give birth to live young, also the coral reefs which line Norway's coast and house huge Lima clams and basket starfish.

In Norwegian waters there are eight species of shark and nine of ray, all common in deep and fairly shallow water. Here they have the grey skate, thornback ray, common dogfish, piked dogfish and the conger eel, which is stronger than ten men, sometimes mistaken for a serpent and a hazard to fishermen's nets.

In the second section they try to show the origin and development of

the various species, their structural processes and function starting with sea anemones, tunicates, the mysterious hagfish (one of the most primitive chordates, which has no pectoral or pelvic fins) and sharks, where we notice that the Aquarium is working up to a vertebrate able to move on dry land and breathe with lungs.

The trout introduces the swim bladder and the fins are in the "right" place. Then comes the lungfish, a blind alley as regards development, but it has a lung-like swim bladder. Then we have the South African mud springers and the stone springers from Hawaii, the Mexican axolotl—a sort of salamander which lays eggs as frogs do, attaching chains of them to plants—and lastly come the salamander and frog. Now we have animals that are dependent on water for breeding but which can also live on dry land and breathe with lungs. The frog has gone furthest and lost his tail. He is almost a rough draft of a human being.

From here we move to the octopus, the angler, deep-sea prawns, echinoderms, crustaceans and mollusks, before seeing something of animal partnerships, regeneration, protective colouring and camouflage, the flat-fish tribe and the salmon family.

People seeing such deep-sea fish as the ling, the tusk and the red-fish often ask: "Is the Aquarium kept under pressure?" The answer is no. These fish are kept alive at a depth of only 1½ metres by removing the air from their swim bladders and abdominal cavity. This is done by a completely harmless process. They insert a thin, hollow needle into the abdominal cavity, then into the swim bladder, whereupon the air bubbles out of the hollow needle. After this the fish lie on the bottom. Then the swim bladder again becomes inflated with air and the fish adapt themselves to the new pressure. They gradually become quite tame after this, even settling on the keeper's hand at feeding time.

Bergen, incidentally, is easily reached overnight from Newcastle by Bergen Line ships or by air from London.

Coming  
Fishkeeping Exhibition  
See page 709





## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 5th of the month preceding the month of publication.

At the December meeting of the **Iford and District Aquarist & Pondkeepers Society**, J. Morris gave a very interesting talk on fish houses and fish shows, using a large number of coloured slides. Aided by these excellent illustrations he described in detail different methods of heating and the use of equipment in the fish house, and his pictures taken at open shows highlighted the different methods of presentation used in displays of aquaria. This was a most instructive and helpful programme for enthusiastic fishkeepers.

Details of meetings to be held in the next few months are as follows: Monday, 10th February—Lecture on "Water" by Mr. Dodkins; Monday, 10th March—Talk on "Fish house construction" by Mr. David Smalley; Table show—A.V. Tropical Livebearer; A.V. Tropical Egg-layer; Monday, 14th April—Auction of fish, plants and equipment for members; Table show—A.V. Fancy Goldfish; A.V. Platy; A.V. Characin. These meetings, which are subject to alteration in content, will be held at 8 p.m. on the dates referred to, at St. Lawrence's Church Hall, Donington Avenue, Barking, and guests will be very welcome.

The officers elected at the annual meeting of the **Stevenage A.S.** were as follows: Chairman, M. Rhodes; vice-chairman, R. Nye; secretary, J. Lohman (17, Broadview, Stevenage, Herts.); treasurer, P. Austin; show secretary, G. Ward; assistant show secretary, A. Toombs. The annual awards were also presented to the following winners: The Sinter Trophy for monthly table shows—R. Nye; the Chairman's Cup for breeders' class—M. Weyl. The runners-up Cup in this class will be shared by A. Johnson and J. Dobbin. For the Best Fish of the Show at the annual general meeting (which was judged by P. Kavanagh of Becky Tropicals), the Sinter Cup was awarded to M. Rhodes.

The **Hull A.S.** held its annual general meeting early in January when the following officers were elected: President, F. Chapman; vice-president, T. Douglas; chairman, A. Douglas; vice-chairman, T. Collingwood; treasurer, E. Storey; secretary, R. Bush, 102, Westcott Street, Hull, 76066; asst. secretary, C. Bitch; show secretary, P. Shepherdson; asst. show secretary, A. Harrison; librarian, C. Burrows.

The chairman in his report said the society had grown during the last year and had ninety-nine members and hoped to repeat the success of the first open show held last year, once again this year. The new secretary said he would be contacting other societies to plan and inform them of events for 1969, and that any secretary is invited to write to him. Mr. Boyce and Mrs.

Wardlow of "Wardlows" of Driffield, were appointed honorary members of the society. New members and visitors are very welcome to the meetings held every first and third Wednesdays of the month at 8 p.m. at the Railways and Docks Club.

MEMBERS of the **Boston A.S.** are busy planning for the first open show to be held in the East of Lincolnshire. The date will be Sunday, 1st June, and the venue, Blackfriars Theatre, Boston. At the January meeting, a fascinating talk on marine tropicals was given by Mr. John Yeaton and Mr. Alan Dales, of Skogness, Nazevald. Mr. Yeaton described his marine set-up at Skogness and pointed out that the salt water was obtained direct from the sea by a unique system of undersea piping. The system is the only one in operation in this country and provides Nazevald with 3,000 gallons of fresh sea water daily. He also exploded many accepted—and expensive—theories with practical proof. Coral decoration, water conditioning, specific gravity, filtration were all dealt with in detail. Mr. Dales has been keeping marines in his home for quite a time, with great success, and believes he has had one spawning. Thanks were expressed by club chairman A. Woodthorpe. The Boston club would welcome any new members to their meetings, held on the first Thursday in each month at Fogarty's Social Club, Mount Bridge, Boston.

The last table show of 1968 of the **Rochampton A.S.** enabled J. Hughes to become the winner of the J. Hughes Cup with the highest total of points from the year's table shows. Two other cups won by J. Waller (first Characin) and A. Morgan (first A.V. Catfish) were presented at the December meeting. Also on the same evening, Mr. D. Yorke was presented with a table lighter for his services to the club. With his departing the position of show secretary has been taken over by J. Hughes and V. Thompson has become a committee member.

Included in the programme of meetings for the first half of 1969 are talks by J. Morrice 26th February; F. Kozinsky, 26th March; and P. Tomkins, 7th May. New members are always welcome on alternate Wednesdays at the Minstead Gardens Old People's Club-house, Danbury Avenue, Alton Estate, Rothampton.

At Kinson Community Centre a member of the **Bournemouth A.C.**, Eric Painter, a well-known local trader, gave a talk which he entitled "Introduction to marine fishkeeping." He illustrated his talk with examples of coral, etc., also some of the various accessories necessary for marine fishkeeping. During the talk he answered a number of questions put to him by the assembly.

The table show of the month was judged by J. Jeffery, with the following results: 1, Mr. McFarlane; 2, Mr. Watkins; 3, Mr. Poole. After the results had been announced, there followed an auction, and Mrs. Margaret Knight then congratulated the club chairman, Mr. Coombes, on becoming an F.E.A.S. "A" class coldwater judge.

The seventh and final round for last year in the club cup championship contest of the

**Crawley College A.S.** has been held. The results of this contest was as follows: 1 and 2, Rex Partridge; 3, D. Evans. Winner and runners up for the Cup are as follows: 1, M. Phillips (15 pts.); 2, D. Evans (14 pts.); 3, R. Partridge (13 pts.).

THE **West Cumberland A.C.** report a change of officers. The new chairman is S. Martin, and the secretary, Mrs. E. M. Satterthwaite, 4 Queen's Crescent, Frizington. An inter-club show was held recently at Carlisle with the **Brampton A.C.** who won by a narrow margin. The best fish in the show was a *Kribia* owned by J. Parker, West Cumberland Club.

THE appointed officers for the coming year for the **Bethnal Green A.S.** are as follows: Chairman, A. Collings; secretary, A. Millhouse; show secretary, J. Coombs; resident lecturer, F. Tomkins; treasurer, A. Hayes. This society meets every Tuesday evening at Bethnal Green Institute, 229 Bethnal Green Road, E.2, at 7.45 p.m., and new members are welcome.

At the annual general meeting of the **Burton and District A.S.**, the following officers were elected: Chairman, R. Walker; vice-chairman and publicity officer, R. W. Foreman; secretary, G. Degg, 198 Hawfield Lane, Winhill, Burton-on-Trent; social secretary, J. Sharratt; show secretary, Mrs. A. Mead; treasurer, R. Poinson; Newsletter editor, G. Mead; equipment officer, A. Clark.

Meetings are held on the second Thursday of each month, at the Fox and Goose, Bridge Street, Burton-on-Trent, commencing at 7.45 p.m.

THE return contest between **Keighley A.S.** and **Horsforth** resulted in another Keighley win by 32 points to 27 points, making Keighley overall winners by 80 points to 39 points. Best in show award went to A. B. White, of Keighley. Judges were Miss Helm, of Horsforth and Mr. Asquith, of Keighley. At the society's annual dinner the awards were presented by A. Asquith. "Fish of the month" winner was A. B. White, and he also won the A.O.V. trophy and the Edinos Trophy. Novice winner was T. Bickle, and junior winner was Master A. White.

THE **Hartlepool A.S.** annual show results were as follows: Guppies: 1, K. Wadlow (Stockton); 2, D. Wainson (Hartlepool); 3, A. Atwell (Peterlee). Mollies: 1, W. Paer (Hartlepool); 2, B. Turnbull (Hartlepool); 3, E. Simpson (Peterlee). Swordtails and Platies: 1, B. Kirkpatrick (Independent); 2, R. Robinson (Aireborough); 3, R. Davidson (Peterlee). Small Characins: 1, A. Tate (Peterlee); 2, P. Sunley (Independent); 3, W. Long (Independent). Large Characins: 1, A. Tate (Peterlee); 2, R. Robinson (Aireborough); 3, P. Frank (Hartlepool). Dwarf Cichlids: 1, P. Bell (Peterlee); 2, P. Reynolds (Swillington); 3, R. Robinson (Aireborough). Large Cichlids: 1, R. Raper (Stockton); 2, E. Patterson (Hartlepool); 3, J. Chamberlain (Hartlepool). Small Barbs: 1, W. Robson (Peterlee); 2, W. Paer (Hartlepool); 3, J. Pleeves (Swillington). Large Barbs: 1, P. Sunley (Independent); 2, L. Collins (Stockton); 3, D. Pye (Peterlee). E.L.T.C.: 1 and 2, M. Curle (Darlington); 3, P. Reynolds (Swillington). Anabantids: 1, F. Patterson (Hartlepool); 2, H. Dixon (Swillington); 3, F. Bell (Peterlee). Fighters: 1, J. Chamberlain (Hartlepool); 2, D. Keighley (Stockton); 3, J. Robertson (Tynside). Catfish and Loach: 1, F. Patterson (Hartlepool); 2, T. Sykes (Independent); 3, P. Reynolds (Swillington). Rasbora, Danio, Minnow: 1, B. Kirkpatrick (Independent); 2, A. Tate (Peterlee); 3, D. Pye (Peterlee). A.O.V. Fish: 1, P. Reynolds (Swillington); 2, K. Dunn (Independent); 3, A. Tate (Peterlee). Furnished Jars: 1 and 2, B. Kirkpatrick (Independent); 3, H. Atwell (Peterlee). Coldwater: 1 and 2, Mrs. E. D. Hunt (Houghton). Breeders (six fish egg-layers): 1, Mrs. R. Robinson (Aireborough); 2, R. Sunley (Independent). Breeders (six fish

White Spot vanishes when you use **halamid** Hillside Aquatics London N12



livebearers): 1. E. Turnbull (Hartlepool); 2. Mrs. R. Robinson (Aireborough); 3. L. Collins (Stockton). Breeders (Pairs): 1. R. Davidson (Peterlee); 2. J. Chamberlain (Hartlepool); 3. K. Down (Willington). Sharks and Labrets: 1. W. Robson (Peterlee); 2. J. Robinson (Peterlee); 3. F. Bell (Peterlee). The best fish in the show award was won by P. Sundry (Stockton) with a Tinfoil Barb.

THERE was a good attendance at the December meeting of **Tonbridge and District A.S.** to hear a talk on breeding by F. Vickers. He covered the items to be considered in breeding any species and gave particular attention to his own specialities—Labyrinthis and Dwarf Cichlids. He also answered members questions. Mr. Vickers judged the table shows with the following results: Botias and Loaches: 1 and 3, Mrs. I. Bellingham; 2, J. Bellingham. Breeders: 1, I. T. Matheson; 2 and 3, T. D. Amos.

AT the annual general meeting of the **Newcastle Guppy and Livebearer Society**, the following officers were elected: Chairman, W. McFarlane (re-elected); vice-chairman, J. A. Samson; secretary-treasurer, R. Skoyles (re-elected); minute secretary, Mrs. S. Samson; librarian, G. Martin. The chairman reviewing the past year stated that although the membership was slightly down the amount of activity in the club had greatly increased, and hoped that the year to come would also expand the club and its activities. Anyone living in the Newcastle area interested in Guppies and Livebearers, should contact R. Skoyles, secretary, 189 Fossway, Walkergate, Newcastle-on-Tyne.

THE main item on the agenda at the December meeting of the **New Forest A.S.** was a most interesting talk and slide show presented by Mr. Terry Goddard. His subject was entitled "Aspects of work at the Freshwater Biological Association's establishment at Wareham." In his talk Mr. Goddard mentioned the origin of the Association in 1929 in Wiltshire. The Wareham establishment was opened in 1965. Descriptions were heard (some amusing) of the hazards of experimentation in uncontrolled conditions and of the varied types of organisms found in freshwater. There were also some harrowing pictures of the effects of pollution.

New members are welcome to the meetings which are held on the third Monday of each month. The secretary is R. Travers of Aukland Avenue, Brockenhurst, Hants. The table show results were as follows: Siamese Fighters: 1 and 2, A. Williamson; Rasboras: 1, K. Newton; 2 and 3, A. Williamson.

THE officials for 1969 of the **Castleford and District A.S.** are as follows: Chairman, J. Goodall; treasurer and society judge, T. Tranter; secretary, A. Town, 34 Camden Road, Airdale, Castleford, Yorkshire; show secretary, J. Thompson; librarians, F. Gates, S. Horsley; ombudsman, G. Thickbroon; committee, C. Asquith, P. Ludwell.

THE recent programme of the **Barry A.S.** included a lecture by the chairman, S. Nelson, on the erection and maintenance of a fish house, and a table show, the results of which were as follows: Livebearers: 1 and 3, A. Ibbertson; 2, Mrs. Dineen; 4, A. Harris. Egg-layers: 1, Mr. Rook; 2, Mrs. Kirkpatrick; 3, A. Ibbertson; joint 4, S. Nelson and A. Ibbertson. Junior Class: 1, P. Ellis (Guppy); 3, P. Ellis (Platy); 4, A. Cursons (Rosy Barb); 4, R. Harrison (Guppy). Breeder's Egg-layers: 1, A. Ibbertson; 2, Mr. Gadd. The committee for the coming year has been selected as follows: President, J. Brockhurst; vice-president, Mrs. F. Curry; vice-president, W. Fors; chairman, S. Nelson; vice-chairman, A. Ibbertson; secretary, D. Richards; show secretary, P. Harris; treasurer, Mrs. E. Steer; assistant show secretary, M. Gadd; acting librarian, M. Gadd. R. Layland, who was nominated for the post of librarian is in Glan-illy Hospital recuperating after a serious illness.

THE **Bristol Tropical Fish Club** confirm that their 1969 open show will once again be of three days' duration and will be held on 26th, 27th and 28th June. Further details will be given as soon as possible. Meanwhile, all enquiries should be addressed to E. Newman (show secretary), 71 Somerdale Avenue, Knowle, Bristol 4. At the December monthly meeting an extremely fine film show was provided by Miss O. Iles, a retired club member whose fine cine-photography skill was ably shown.

THE **Merseyside A.S.** can look back on 1968 with some measure of satisfaction. Throughout the year, there has been a steady increase in membership which has now reached an all time high in membership numbers. There are, inevitably, likely to be a few members who cannot renew their memberships this year, but it is hoped these will be few and that the influx of new members will continue its present trend. There have been some excellent meetings in the past twelve months and members have enjoyed success at many Open Shows around the country. A great many of the newer members have proved themselves to be keen aquarists, eager and willing to learn from lecturers and older experienced members, and there is a very satisfactory social spirit of goodwill prevailing in the society.

Recently, a discussion was held on equipment. Messrs. Water World Ltd. kindly loaned a quantity of equipment, including a range of heaters, thermostats, filters, pumps, thermometers, breeding traps, etc. These were shown to members by K. Parker, who explained their merits and functions and priced each item as it was shown. Members asked questions and volunteered opinions on the various items shown. Newer members were keen to learn of the merits of different makes of equipment, particularly in the light of the experience of those who have been fish-keeping for some time. This proved to be an interesting meeting and seemed particularly to cater for the need of the less experienced aquarist to learn what to look for when confronted, in his dealer's shop, by the mass of modern equipment now on the market.

THE **Horsforth A.S.** Aquarists Convention was attended by well over 300 people. The two well-known lecturers gave a very interesting talk accompanied by a film and slides and there was also a raffle.

AT a club meeting of the **Warrington A.S.**, Mr. F. Partridge gave a lecture entitled "Show Standards." After explaining the pointing system, he went on to judge some fish taken at random, and at the same time members themselves were judging the fish under his guidance. The results afterwards showed that on average, most members agreed with one another, proving that the lecture was a success.

The fish of the month results were: Pairs Egg-layers: 1, M. Baker; 2, B. Worrall; 3, Messrs. Worrall and Gavin. Pairs Livebearers: 1 and 2, B. Worrall; 3, J. Alcock. At a later meeting members and friends were entertained with a slide and taped lecture show entitled, "A Matter of Breeding," which thoroughly covered all aspects of fish breeding and most members must have gained some useful tips. As usual J. Kelly gave his taped lecture with touches of humour, ensuring that this show was a great success. Fish of the month results were as follows: Mollies: 1 and 2, M. Baker; 3, B. Worrall. Guppies: 1, 2 and 3, B. Worrall. A.O.V. Goldfish: 1, D. Gavin; 2, E. Clarke. Swordtails: 1, J. Alcock; 2, J. Higham; 3, R. Tench. Platy: 1, L. Crawford; 2, R. Tench; 3, B. Worrall. A.O.V. Livebearer: 1 and 3, A. Addison; 2, L. Crawford.

AT the annual Christmas dinner of the **Wendesbury A.S.**, the president, Mr. E. Skidmore, presented the trophies for the year 1967-68 to the winners of the monthly table shows. These were as follows: Novice class: 1, T. January; 2, B. Bennett; joint 3, T. Jones and W. Tyson. "A" class: 1, O. Highfield; 2, T. Skipton.

3, B. Cohen. Breeder's class: Livebearers, J. Reeves; Egg-layers, T. January. In addition, the chairman, E. Hyde, presented his personal trophy to A. Mawbey, who was chosen as the best club member of the year.

THE annual dinner of the **Llantwit Major A.S.** was well supported with most of the local societies being represented. Mr. and Mrs. J. Wheeler were guests along with Mrs. Curry from Penarth. The president, Alderman P. Smith, C.B.E., presented the following trophies: W.C.M.R. Smith to Stan Nelson as member of the year, he also received the J. Holmes memorial Cup for Breeders Egg-layers; the Points Cup went to A. Ibbotson, the Stampton Cup to A. Rogers, and the President's Trophy was won by R. Wigg for Breeders Livebearers. At an earlier meeting the members were hosts to the Bridgend Society for the inter-club table show. This was won by Llantwit Major by 16 points. The judge was Mrs. P. Barcina.

At the December meeting the members were entertained with 16mm films "Hard Water," Plant Breeding and Genetics, which proved of great interest. Two other films were also enjoyed by everyone, although not of interest to the hobby. The following were enrolled as new members, Messrs. D. Davies, W. Isaac, W. Pugh, R. Scaward, H. Thomas and R. Vintcombe. The date for the next annual open fish show is Saturday, 14th June, 1969, in the Llantwit Major Town Hall.

A film show was held and three films shown at the December meeting of the **Whitstable and District A.S.** The guest for the evening was Mrs. A. Young, who is going to Zambia shortly. Mr. H. G. Dempster, chairman, said that the entertainments for 1969 will include a film on Tropical fish house construction, and a talk on live feeding; slides on tropical fish, a 'tramps' barbecue supper-dance and later in the year a dinner-dance. The evening ended by the secretary expressing a vote of thanks on behalf of the members to Mr. and Mrs. Crouch of the Whitstable Film Society for providing such an enjoyable evening.

THE final meeting of the **Basingstoke A.C.** before moving to larger premises was a Club fish and social evening held on 13th December. The ladies present judged the fish which resulted in a win for Master A. Clark, second being Stephen Box and third A. Marshall. A quiz between the junior and senior members resulted in a win for the junior members. The new premises will now be at the White Hart, London Road, Basingstoke.

AT the annual general meeting of the **Newport A.S.** the following officers and committee members were elected: Chairman, T. Wall; Secretary, J. Parsons; Treasurer, J. Lowndes; Show Secretary, J. G. Phillips, Junior; Representative, A. Berry. The other members are N. Nerway, H. Walker, W. Chapman, G. James. This was followed by the presentation of club awards for the 1968 Championship Shield for highest aggregate points in table shows, and Breeders Cup—A. Payne. Championship Table Competition and Best Livebearer, Master J. Walker; Best Egg-layer, A. Fryse. Furnished Aquaria Cups, Tanks over 24 inches, J. Lowndes, 24 inches and under, L. Bannerman. Ladies Class, Mrs. H. Walker. The Junior Cup for entries in table competitions was won by Master J. Walker.

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Hillside Aquatics London N12



THE Swillington A.S. had Selby A.S. as guests at their most recent meeting, the entertainment being provided by P. Reynolds. At other meetings recently there have been two slide shows, one on brine-shrimp from Hendon A.S. and the other on Cichlids from R. Hampson, and a talk on breeding fishes by H. R. Scott, who has had considerable success in this field.

Results of recent table shows are: Rasboras: 1, E. Jubb; 2, P. Haigh; 3, P. Reynolds. Pairs egglayers: 1, Mr. and Mrs. R. Stringer; 2, D. Dickson; 3, G. Binks. The S.A. Pullan Trophy for A.O.V. was won by P. Reynolds, who also won the Richardson Pethip Trophy for Fighters.

Owing to pressure of work Mr. G. Nash has had to retire from his office of Secretary and all correspondence should now be sent to the new Secretary, Mr. H. R. Scott, 12 Lilsac Avenue, Thorne, Wakefield.

THE speaker at the December meeting of the Harlech A.S. was the Chairman, W. Gorwill, who spoke of his experiences of keeping the larger species of tropical fish, particularly Cichlids.

The winners of the table show competition, for two classes, Egglayers and Livebearers, judged by M. Parry, were, Egglayers, R. Wilkie; Livebearers, C. Beaman.

Meetings of the Society are held on the third Tuesday of each month at the Gabalfa Junior School, Colwill Road, Cardiff, and an attractive programme is being prepared for 1969. Coming attractions are an "Any Questions" session to be held in March, a slide lecture on the construction and stocking of ornamental garden pools (April), and an address by the Keeper of Zoology, National Museum of Wales (May).

AT a well attended third Annual General Meeting of the Nuneston A.S. the members elected the following as the officers: President, R. Mayer; Chairman, D. Rice; Vice-Chairman, P. Beasley; Secretary, D. Tunnicliff; Treasurer, B. I. Cox; Show Secretary, G. Cox—Assistant, K. Edkins; Committee, Messrs. Wincott, Freeman, Ascott, Mrs. Leigh; Hon. Auditors, Messrs. Muggleton and Blonham.

THERE were 579 entries at the Aireborough and District A.S. Seventh Annual Open Show and the following were the awards: Best novice exhibit: Characin 82 points, Miss S. Gerrard (Alfreton). Furnished aquaria, won by 'Halifax' with 78 points, set up by Mr. Shields. Best breeders' exhibit (Livebearers) Swordtails 80 points, J. Tunney (Stockbridge). Best breeders' exhibit (Egglayers) Barbs, 81 points, J. and V. Wright (Alfreton). Exhibitor with most points, Mr. Eadon (Sheffield) 20 points. Results: Novice Classes: A.V. Livebearers: 1, E. Kirkland (Sunnybrow); 2, Mr. and Mrs. Hogarth (Rochdale); 3, E. Kirkland (Sunnybrow). A.V. Barb: 1, Mrs. J. Lacey (A.D.A.S.); 2, W. Duncan (Barnsley); 3, Mrs. Carey (York). A.V. Characin: 1, Miss S. Gerrard (Alfreton); 2, Master D. Lacey (A.D.A.S.); 3, J. Kay (A.D.A.S.). A.V. Cichlid: 1, Mrs. M. Kaye (Huddersfield); 2, Master K. M. Scothern (Barnsley); 3, C. Thompson (A.D.A.S.). A.V. Anabantid: 1, R. Asquith (Lincoln); 2, Miss S. Gerrard (Alfreton); 3, Master D. Robinson (A.D.A.S.). A.V. Carps and Minnows: 1, P. & B. Jones (Barnsley); 2, Mrs. Brown (Moxden); 3, J. Kay (A.D.A.S.). A.V. Catfish and Loach: 1 and 3, Mr. Rhodes (York); 2, M. J. Allison (York). A.O.V.: 1, Miss S. Gerrard (Alfreton); 2, Master D. Robinson (A.D.A.S.); 3, B. Cassidy (Lincoln).



# 1969

## BRITISH AQUARISTS' FESTIVAL

18th and 19th October  
at Belle Vue, Manchester

Best exhibit in section: Characin: Miss S. Gerrard (Alfreton).

Furnished Aquaria: 1, Halifax, 78 points, set up by Mr. Shields; 2, Swillington, 77 points, set up by Mr. and Mrs. Stringer; 3, Aireborough, 67 points, set up by Mr. and Mrs. Robinson. Breeders Classes (Livebearers): Six Guppies: 1, Mr. Thickbroom (Pontefract); 2 and 3, Mr. Gardner (A.D.A.S.). Six Platies: 1, Mr. Gardner (A.D.A.S.); 2, R. Hesley (Barnsley); 3, Mr. and Mrs. Hogarth (Rochdale). Six Swordtails: 1, J. Tunney (Stockbridge); 2, Mr. Burnap (A.D.A.S.); 3, Mr. Gardner (A.D.A.S.). Six Mollies: 1, D. Shields (Halifax); 2, Mr. Burnap (A.D.A.S.); 3, J. Whiteley (A.D.A.S.). Six A.O.V. Livebearers: 1, T. and W. (Sunnybrow); 2, Mrs. R. Robinson (A.D.A.S.). Best exhibit breeders (Livebearers): Swordtails, 80 points, J. Tunney (Stockbridge).

Breeders (Egglayers). Six Barbs: 1, J. and V. Wright (Alfreton); 2, F. Buxton (Barnsley); 3, Mr. and Mrs. D. Cohen (Pontefract). Six Characins: 1, F. Buxton (Barnsley); 2, Mrs. R. Robinson (A.D.A.S.); 3, F. Buxton (Barnsley). Six Cichlids: 1, P. Barrist (A.D.A.S.); 2, G. Robinson (Brampton). Six Anabantids: 1, P. and B. Jones (Barnsley); 2, Master A. Kaye (Huddersfield). Six Carps and Minnows: 1, Mr. and Mrs. T. Webb (Salford); 2, Mr. and Mrs. T. Webb (Salford); 3, P. Reynolds (Swillington). Catfish, Loach and A.O.V.: 1, J. W. Holmes (Tadcaster); 2, D. Wragg (Alfreton); 3, D. W. Smith (Tadcaster). Best exhibit breeders (Egglayer): Barbs, 81 points, J. and V. Wright (Alfreton).

Advanced classes. Guppies: 1, D. W. Smith (Tadcaster); 2, J. Greenwood (Halifax); 3, Mr. and Mrs. Geimshaw (Sunnybrow). Platies: 1, D. C. Thompson (Loughborough); 2, Mr. and Mrs. T. Webb (Salford); 3, Mr. Skyles (Tyneside). Swordtails: 1, Mr. Burnap (A.D.A.S.); 2, Mr. and Mrs. Cohen (Pontefract); 3, D. and R. Stander (Loyne). Mollies: 1, J. Gresty (Sunnybrow); 2, D. and R. Stander (Loyne); 3, Mr. Bickle (Keighley). A.O.V. Livebearer: 1, T. and W. (Sunnybrow); 2, Master D. Ward (Rotherham); 3, F. Hopewell (Loughborough). Siamese Fighters: 1, Mr. Robertson (Tyneside); 2 and 3, R. Taylor (A.D.A.S.). A.O.V. Anabantid: 1, Mr. Faircliff (Tadcaster); 2, R. Taylor (A.D.A.S.); 3, A. Middleton (Sunnybrow). Dwarf Cichlids: 1, R. Taylor (A.D.A.S.); 2, D. C. Thompson (Loughborough); 3, S. Boswell (Top Ten). Angelfish: 1 and 2, Mrs. R. Robinson (A.D.A.S.); 3, Mr. Allhopp (Alfreton). A.O.V. Cichlid: 1, P. Barrist (A.D.A.S.); 2, D. Kennedy (Bradford); 3, R. Taylor (A.D.A.S.). Small Barbs: 1 and 2, F. Buxton (Barnsley); 3, W. Payer (Hartlepool). A.O.V. Barb: 1, R. Taylor (A.D.A.S.); 2, Mr. and Mrs. Geimshaw (Sunnybrow); 3, P. Carey (York). Small Characins: 1, Mr. F. Buxton (Barnsley); 2 and 3, J. and V. Wright (Alfreton). A.O.V. Characin: 1, J. Whiteley (A.D.A.S.); 2, P. Reynolds (Swillington); 3, Mrs. R. Robinson (A.D.A.S.). Toothcarps: 1, Mr. Greenall

(Tadcaster); 2, D. Jackson (Rotherham); 3, J. Roberts (Nelson). Flying Foxes and Sharks: 1, A. G. Whyte (Halifax); 2, Miss L. Bradley (Swillington); 3, L. Goldsmith (Brampton). Rasboras, Danios and Minnows: 1, J. and V. Wright (Alfreton); 2, T. and W. (Sunnybrow); 3, P. Reynolds (Swillington). Corydoras Catfish: 1 and 2, A. G. Esteres (Top Ten); 3, W. Audsley (Horsforth). A.O.V. Catfish: 1, D. and R. Stander (Loyne); 2, P. Parrinson (Hartlepool); 3, A. G. Esteres (Top Ten). Loaches: 1, Mr. Parkin (Huddersfield); 2, M. J. Allison (York); 3, Mr. and Mrs. T. Webb (Salford). A.O.V. Tropical Fish: 1, H. G. Naylor (Halifax); 2, P. Reynolds (Swillington); 3, P. Carey (York). Pair of Livebearers: 1, P. Barrist (A.D.A.S.); 2, Mrs. R. Robinson (A.D.A.S.); 3, D. Cumpsty (Loyne). Pair of Egglayers: 1, Mrs. Whitefield (Keighley); 2, D. and R. Stander (Loyne); 3, Mr. Parkin (Huddersfield). Common Goldfish: 1 and 2, Mr. Eadon (Sheffield); 3, D. Cole (Swillington). Fancy Goldfish: 1 and 2, Mr. Eadon (Sheffield). A.O.V. Goldwater Fish: 1 and 2, Mr. Eadon (Sheffield). Furnished Mini-jars: 1, H. G. Naylor (Halifax); 2 and 3, D. Shields (Halifax). Aquarium Plants: 1, Mrs. J. Green (A.D.A.S.); 2, Mr. Robertson (Tyneside); 3, J. Whiteley (A.D.A.S.). A.V. Marine Fish: 1 and 2, Mr. Eadon (Sheffield). Best exhibit in section: Piranha, 87 points, J. Whiteley (Aireborough).

### NEW SOCIETIES

THE inaugural meeting of the Harlech A.S. was held on the 4th December, attended by sixteen aquarists within the Cardiff area. Officers appointed were: Chairman, W. Gorwill; secretary, M. J. Parry, 57 Caerlan Court Road, Cardiff; treasurer, A. Payne; show secretary, P. Garner. Meetings of the society are held at the Gabalfa Junior School, Colwill Road, Cardiff, on the third Tuesday of each month (7.30 p.m.). Visitors and prospective new members are cordially invited to attend.

THE Boreham Wood and District A.S. announce the re-forming of a club in Boreham Wood at "Manor House", Allum Community Centre, Allum Lane, Boreham Wood, Herts. For further details please telephone the secretary, L. J. Kain at 01-953 8391.

THE Norwich and District A.S. was formed early in November and the membership is now forty. Recently, a party was held followed by a table show. The results were as follows: 1, N. Bussey; 2, F. Cummings; 3, Mrs. Hill. At the annual meeting the committee elected for 1969 was: Chairman, A. C. Coe; vice-chairman, H. G. Bussey; hon. secretary, P. H. Groves, 35 Folly Road, Wymondham, Norfolk; hon. treasurer, T. Garner; committee, A. Buck, D. Martin, J. Steward. A programme of slide tape lectures, talks, and coach trips are planned for this year. Meetings are held at the Grove House Hotel, Newmarket Road, Norwich, and new members will be very welcome.

PREVENTS  
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#### SECRETARY CHANGES

Newport A.S. J. Parsons, 53, Farmwood Close, Newport, Mon.  
Swillington A.S. H. R. Scott, 12, Lillar Avenue, Thorne, Wakefield.

#### AQUARIST CALENDAR

**2nd March:** Association of Manchester and District Aquarist Societies. Open Show at the Study Centre, Werneth Park, Oldham, Lancs. Open to all societies. Schedules from Show Secretary, M. Jones, 9, Bedford Street, Chesham, Bury, Lancs.

**2nd March:** Keighley A.S. Second Open Show, Victoria Hall, Victoria Park, Bradford Road, Keighley. Schedules from Mr. A. Asquith, 46, Daleside Road, Riddisden, Keighley, Yorks.

**2nd March:** Federation of Scottish Aquarium Societies' March Convention, The McLellan Galleries, Sauchiehall Street, Glasgow. Entries from 10 a.m. until 1 p.m. Host society, Scottish Aquarium Society.

**2nd March:** A.M.D.A.S. Open Show, Werneth Park, Oldham. Open to all societies. Show Secretary, M. Jones, 9, Bedford Street, Chesham, Bury, Lancs.

**9th March:** Huddersfield Tropical Fish Society. Open Show at the Drill Hall, St. Paul's Street, Huddersfield. Show schedules from E. Kaye, 38, Cliffe Road, Holmfirth, Huddersfield.

**12th April:** East Dulwich A.S. First Open Show, at St. Barnabas Parish Hall, Dulwich Village, London, S.E.21. Further details will be announced later.

**19th April:** Reading and District A.S. Annual Open Show, All Saints Hall, Devonshire Square, Bath Road, Reading. Full particulars from Show Secretary, B. Grant, 20, Dover Street, Reading, Berks.

**26th April:** Thurrock Open Show at Gypsy Lane, Grays, Essex. Full details at a later date.

**1st and 3rd May:** Southend, Leigh and District A.S. Open Show, Municipal College, Victoria Circus, Southend-on-Sea (close Southend (Victoria) Station). Full details from Show Secretary, R. Passmore, 39, Grafton Road, Canvey Island, Essex.

**4th May:** Leigh A.S.

**11th May:** Workop A. and Z.S. Open Show at North Notts College of Further Education, Blyth Road, Workop.

**18th May:** Coventry Pool and Aquarium Society, Midlands Aquarist League. Table Show, Foleshill Community Centre, Foleshill Road, Coventry.

**18th May:** Merseyside A.S. Open Table Show at the Montrose Social Club.

**18th May:** Rainworth and District A.S. Open Show at the Showrooms of J. Taylor and Sons, West End Garage, West Gate, Southwell, Notts.

**24th May:** Taunton and District A.S. First Open Show at Priory Secondary Modern School, Cranmer Road, Taunton. Schedules available from Show Secretary, D. J. Rumsey, 52, Parklands Road, Wellington, Somerset.

**1st June:** (Provisional Date) Nuneaton A.S. Second Annual Open Show. Particulars from Show Secretary, G. Cox, 36, Manse Court Road, Nuneaton.

**1st June:** Bournemouth A.C. Annual Open Show at Kinson Community Centre, Pelham Park, Kinson, Bournemouth. Show schedules and entry forms available after 1st April from Show Secretary, J. V. Jeffery, 20, Braemar Avenue, Southbourne, Bournemouth, BH6 4JF.

**14th June:** Southampton and District A.S. Open Show at St. Denny's Church Hall, Southampton. Details from Show Secretary, C. McCann, 7, Waterhouse Way, Southampton, SO1 3PA.

**14th June:** Llanrwst Major A.S. Annual Open Show in the Llanrwst Major Town Hall.

**15th June:** Swillington A.S. Open Show.

**15th June:** Brighton and Southern A.S. Open Show (provisional date).

**21st June:** Bracknell A.S. Annual Open Show, at the Priewood Community Centre, Priewood Court Road, Bracknell. Show Secretary, Mr. Len Little, 126 Shepherds Lane, Bracknell.

**22nd June:** Alfreton and District A.S. Annual Open Show, at the new Adair Education Centre, Alfreton Hall. Details from Show Secretary, Mr. S. Hill, 35 South Street, Riddings, Derbyshire.

**22nd June:** Open Show Coventry Pool and Aquarium Society, at Foleshill Community Centre, Foleshill Road, Coventry. Schedules from C. J. Grant, 26 Cecily Road, Coventry.

**26th-28th June:** Bristol Tropical Fish Club. Open Show. Details from E. Newman (show secretary), 71, Somerdale Avenue, Knowle, Bristol 4.

**29th June:** Medway A.S. Further details to follow.

**6th July:** Leamington and District A.S. 4th Annual Open Show.

**6th July:** High Wycombe A.S. Open Show at Bovingdon Green Hall, Nr. Marlow, Bucks. (Further information later).

**6th July:** Lytham A.S. Annual Open Show, Lowther Pavilion, Lowther Gardens, Lytham, Lancs.

**10th-13th July:** Aquarist and Pondkeeper Open Show, Alexandra Palace, London, N.22.

**20th July:** Gosport and District A.S. Third Annual Open Show.

**2nd August:** Stroud and District A.S. Open Show, Archway School, Paganhill, Stroud.

**14th September:** Oldham and District A.S. Open Show, Werneth Park, Oldham.

**18th, 19th October:** British Aquarists' Festival, Belle Vue, Manchester.



## The Aquarists' Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. 6d. to *The Aquarist*, The Bunts, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

## Announcing

# The Aquarist & Pondkeeper FISHKEEPING EXHIBITION

to be held at

Alexandra Palace,  
Wood Green, London, N.22

on

10th, 11th, 12th & 13th July 1969

further particulars will be given in the  
March issue