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and Pondkeeper

MARCH, 1961



MONTHLY
Vol. XXV No. 12

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VOL. XXV No. 12

1961

Editorial

SOME weeks ago we were criticised by a reader for what he alleged to be an excessive use of technical terms and "Latin" in our pages. "Remember the ordinary chaps who don't understand these names" he wrote. This is, in fact, always our endeavour, and we try to limit the use of technical jargon. However, the field of aquarium-keeping impinges on several technical subjects, and some technical terms, properly applied, can scarcely be avoided; most of these are defined in standard dictionaries. But what our correspondent meant by "Latin" we believe to be the scientific names of animals and plants, which we print in italics, as they should always be printed.

We are accustomed to complaints about the use of scientific names and we are familiar, too, with the practical aquarist who insists that their use by other aquarists is pretentious behaviour. Where a generally accepted and suitable common name is available we give this preference, but what is a common name well known in Britain might be unrecognisable or even offensive to, say, Americans. In some instances no common name exists or one does not "catch on" (who uses the common name for *Vallneria*, for example?). Scientific names, difficult to pronounce though they may be, are recognisable and acceptable in all countries and cause confusion but rarely.

We recently saw in the Monthly Newsletter of the Brisbane Aquarium Club that names of Australian fishes are creating difficulties for aquarists, but it is the multiplicity of common names that is the cause of complaint. Who could know that "spangled grunter," "bobby," "mouth-brooding perch," "mouth almighty" and "sleeping fish" are all names for a single species? The same publication mentioned the way in which popular names are liable to become contracted and quotes as an example the name "white cloud" for the white cloud mountain minnow (*Tamichthys albonubes*). With such changes the original significance of common names is completely lost and this seems to be a further limitation to their value.

Tropical Fish Breeding for Beginners

by CHARLES WRIGHT

EGG-LAYING tropical fishes, or to give them their correct name, oviparous fishes, with just a few exceptions can be divided into three classes, the chasers, the bubble-nest builders and the larger cichlids, who lay their eggs on a prepared base of rock, a saucer or the inside of a flower pot. The chasers can again be divided into two groups: those that deposit their eggs in clumps of fine-leaved plants and those that scatter their eggs over the floor of the aquarium. One important thing to remember about the chasers is that, because they are very fast swimmers the breeding tank must have length irrespective of height or width, so nothing less than a 24 in. aquarium should be considered and water level should not be above 9 in.

Chasers

It is generally agreed that the zebra fish (*Brachydanio rerio*) is the easiest of the chasers to breed. These fish scatter their eggs over the floor of the aquarium and as they are avid egg-eaters and very fast swimmers we must adopt means of stopping this habit of egg-eating. So, instead of sand or gravel on the base of the tank, we will have to cover it with marbles or a well-washed ballast or shingle, which should be no smaller than three-quarters of an inch in diameter; these spread over the base will form a large number of crevices into which the eggs will fall out of harm's way.

One corner of the tank should have a large bunch of *Ficuzalis* (willow moss) or any of the other fine-leaved plants; this will form a hiding or resting place for the female when she has finished spawning. This tank should be set up at least a week before the fish are put in and temperature should be maintained between 75° and 78°F.

Before we can think of breeding we must have the fish and the best way to get a good breeding pair is to purchase about half a dozen, and as zebras are a very cheap fish the outlay is small. Tell your dealer that you wish to try your hand at breeding them and he will pick you out some likely pairs; these will be between 1½ in. and 1¼ in. in length, or some strong youngsters can be obtained. Put these in a tank on their own, maintain the temperature at 75°F and feed them mostly on live or meaty foods. Feed with white worms and Grindal worms alternately with live *Daphnia*; a piece of raw beef about the size of an Oxo cube can be suspended in the tank for a day but must be removed at night; cod roe (hard) and prawn eggs are also taken with great relish.

In 6 or 8 weeks you should be able to pick out your pairs, the females now being very plump in the body whereas the males keep their nice slim figures and you will find that their blue stripes are more brilliant. When you are satisfied that these two conditions have been fulfilled you can

transfer your largest female and two males into the breeding tank, the temperature of which should be raised to 80°F. As you will no doubt wish to see the actual spawning I suggest that you transfer them on a Friday evening so that with a little luck you should be able to have them under observation Saturday and Sunday while you are at home. If they are really in tip-top condition, on Saturday morning the males should start waddy chasing the female, and you will immediately notice how different it is from the chasing that went on in the other tank. I am not for one moment suggesting that you should sit watching the tank all day, but have a look at it every hour or so and if at any time you see them swimming close together observe them very closely to see if any eggs are being released by the female; the nearest description of the eggs I can give you is that they look like a shower of small semolina.

Once spawning is finished the parents should be taken out as soon as possible and at 80° to 82°F the eggs should start hatching in about 36 hours, and will continue to hatch for a day or two. The new-hatched fry will be seen as small, black hair-like slivers hanging to the plants and the sides of the aquarium. (In 1946 I was assisting an aquarist to breed his zebras and we found that eggs were still hatching 7 days later and altogether 900 fish were reared from the one spawning of two females and three males.)

Infusoria Culture

The fry are hatched with what is known as an egg-sac; this provides the fish with food for 2 or 3 days. In 3 days they should be swimming about quite freely, and this is the time that they require plenty of food given in small doses but at very frequent intervals. It will be seen from the size of these young fish that the food must be very small. There are three types of food available: very fine prepared dry food, the hard-boiled yolk of an egg squeezed through a linen bag and the third and by far the best food is live Infusoria, and I feel that I cannot go further without explaining what this is and how to acquire it.

In the broadest sense Infusoria are minute forms of animal and vegetable life on which the fry would feed in their native haunts. A culture of Infusoria can be obtained in a large number of ways, but it is sufficient to say that the basis of a culture is vegetable matter and all breeders have their own system; I can only give you guidance for you to experiment. This you should do while conditioning your parent stock, don't leave it until they have spawned. When you have found your best and easiest method and noted how long it takes to germinate under your conditions you will be able to prepare it as and when required.

Any one of the following materials can be used with success: crumbed lettuce leaves, sliced raw potato, spinach, hay or banana skins; the amount to be used depends upon the



Photo

W. J. Hines

amount of water and will only be found by experiment.

There are also on the market several media for the successful culture of Infusoria; have another chat with your dealer, he will be only too willing to help you, or if he is too far away a letter to advertisers in *The Aquarist* (enclosing stamp) will obtain for you full particulars of their products. It is preferable, when starting a culture, to use the water from a pond, water boat, an old-established aquarium or even the water out of the flower vase. Have two or three glass containers of this water and place in each one of the above media and in 2 or 3 days you should have a culture of Infusoria. This will best be seen by gently raising the container to the light, when the organisms will be seen as a greyish white dust suspended in the water; this can now be fed to the fry.

There are several methods of doing this; the most popular way is to suspend the jar containing the infusion above the tank and with one-eighth inch rubber or plastic tubing (that which is sold as air line is ideal) and with the aid of a pinch-cock (a clamp used to control air pumped into tanks) the flow can be adjusted to a steady drip, and according to the size of the container can be made to last several hours. Its disadvantage is that in a cold room the cold drip can have an adverse effect on the fry and also kill the Infusoria, which is sensitive to a quick change of temperature. A safer method is to float the vessel in the tank for an hour, when it can be strained through butter muslin straight into the tank. If you should have a spare tank or an extra large vessel this can be fitted with a thermostat and heater, which can be adjusted to keep the infusion at the same temperature as the fry tank when they are being fed. Fry should be feeding every minute that they have light and a crystal-clear aquarium will denote a lack of food, which should be rectified immediately.

After a week or 10 days the fry should be large enough to take fine dried foods, fine sifted *Daphnia* or finely chopped *Tubifex* worms, which should be well washed. After another week Grindal worms can be used and at a month old the young zebrafish should be able to manage the normal foods. Before leaving the question of feeding, let me say that this method of feeding is applicable to all the egglayers

that you may wish to breed. To satisfy yourself that the food is eaten watch the fry through a large magnifying glass, and see if the food is small enough for them to take into the small mouths.

I have dealt here with the zebra fish, but broadly speaking the same method applies to all the chasers, the only difference being that some others deposit adhesive eggs that stick to the foliage of plants. For these we have aquarium sand on the base of the aquarium and provide bunches of fine-leaved plants where the females can deposit their eggs.

Bubble-nest Builders

Now let us consider the group of bubble-nest builders (anabantids or labyrinth fishes). These are a smaller group and the easiest of these to breed is the three-spot gourami and the blue gourami, which is very often sold as the three-spot (the difference is that the three-spot is light brown in body and its true name is *Trichogaster trichopterus*, and the blue variety is known as *Trichogaster trichopterus* var. *siamensis*); both grow to 5 or 6 in. and will breed when about 3 in. at a temperature of 78° to 80° F.

These fish should be conditioned in the same way as other breeding stock, with plenty of live foods and a variety of foods, and as they are reasonable in price three or more young fish can be purchased and put in a tank on their own for conditioning.

When your gouramis are about 1½ to 2 in. in length their sex can very easily be ascertained: the dorsal (or top) fin of the male comes to a sharp point and is longer than that of the female, whose dorsal fin is well rounded at the tip. When they are in breeding condition you will find that one of the males has started to blow bubbles on the surface of the water, and since you last saw them he may have built a nest of bubbles anything up to 6 in. in diameter and raised about ½ in. above the surface; a quick survey of the fish will show you the male who is blowing the bubbles and which female he is paying his attentions to. This he will do by trying to drive her under the nest. As soon as you have found out which pair it is, as gently as possible and without disturbing the nest too much remove the other fish and in one corner of the tank place a large clump of plants, where the female can take refuge from the male's often vicious attacks that occur when spawning is finished, or even before.

When the female is satisfied that the bubble nest is finished she will succumb to the male's embrace; this he does by wrapping his body entirely around her in such a position that his nose will touch his tail, in doing this he squeezes the eggs from her body and a dozen or more will be seen to drop to the floor of the tank. The fish will then separate and go round picking the eggs up in their mouths and then blow them into the nest, with more bubbles round them to hold them in place; this embracing may carry on at intervals for an hour or more and when finished the male will turn on the female, driving her away from the nest. A piece of glass, slightly smaller than the width of the tank, will be very handy now to pen her in a far corner of the tank and from there she can be netted out without disturbance of the nest by unnecessary chasing.

The male now has control over the nest and eggs. He will be busy picking up the last of the eggs and any that may have fallen from the nest and returning them to their proper place. Don't get alarmed because he has a mouthful of eggs; he is not eating them and it is worth while spending some time watching this process, not only is it very interesting but you are also learning something about the habits of the fish. After about 36 hours you should be able to see the newly hatched fry falling from the nest. Here again time is not wasted watching the male's attempts to keep the fry in the nest; you will have a fit when you see him pick up eight or nine babies in his mouth and still search for more, but don't worry, watch him very carefully and you

will be able to see him blow them back into the nest, and as he does so more will fall down and he starts all over again. The male is kept busy like this for 3 days until they are free-swimming; during this period he will almost starve himself, so as soon as you see the fry swimming about you will be well advised to remove him, or he will have a good feed on the babies he has so carefully nursed for 3 days. I always use an open-mesh net for this purpose as he is a very large fish and the fry will not get caught up in the net with him; take your time and net him as gently as possible.

Feed the fry as suggested above for the zebra. This feeding, with only a few exceptions, applies to all the egg-layers. It is also a good system to put a jar of Infusoria into the tank a day before the fry should be free-swimming so that the first swimmers will find food immediately they require it; this will help to keep losses down and make for quicker growth, which in gouramies is very rapid for the first 4 or 5 weeks, after which they seem to stop growing for a couple of weeks before putting on another spurt.

I have dealt only briefly with the breeding of two of the egg-layers, but in back and future numbers of *The Aquarist* you will find fuller accounts of the breeding of almost every common type of fish, but I find that if you have only a little knowledge you will spend more time observing the habits and gain personal knowledge of your own fishes, which is most important. After all, no two fish have the same temperament and when a breeder describes the breeding

of a certain type of fish he is stating only his views of what he saw and did; the same species in your hands might behave quite differently, although the actual spawning in each species is always the same. One breeder might state that his male or female was vicious before, after or during a spawning, another speaking of the same species will say that they were gentle and well behaved. It is only by reading of other peoples' experiences and breeding your own fishes that you will be able to draw your own conclusions and perhaps even disagree with the experts.

The whole of this article is based only on my own experiences; there will be dozens, maybe hundreds, who will disagree with me and write letters to the Editor telling me where I have gone wrong according to them; this will all help to make *The Aquarist* more interesting to read. Ever since aquatic books made their appearance the letters and questions and answers pages have always been the first that I turn to and I have learnt a lot from them, as I hope you will.

Many is the time that I have been asked to answer what has appeared, to the speaker, to be a silly question, but the answer has really turned failure into success, and some childish questions have sent me to search the books for the answer. In that way, I also have learnt something else to my advantage, so please don't have a failure just because "I did not like to ask." You will find that a true aquarist is always ready to assist you with his own knowledge.

KING OF TROPICAL FISHES

Inheritance in the Guppy

by PETER DENDY

THIS article is intended to serve as a brief introduction to the subject of inheritance and genetics in the guppy. If my statements are too broad in their scope, then expert readers must forgive me, because my own knowledge does not go beyond the basic principles.

Each sex cell (sperms, produced by the male, and ova, produced by the female) contains half the number of chromosomes required to produce an offspring: 23 in each ovum and 23 in each sperm, making a total of 46, or 23 pairs, in the fertilised ovum. Ova carry 22 ordinary chromosomes and one "X" chromosome; sperms carry 22 ordinary chromosomes and a further chromosome which may be "X" or "Y." When an X-chromosome sperm meets an ovum the result is XX (a female offspring), but when a Y-chromosome sperm meets an ovum the result is XY (a male offspring).

Generally speaking, male finnage is controlled by the Y chromosome and inherited finnage characteristics are through the male only, which in theory would indicate that

a male could be mated to any type of female and breed true. However, experiments have shown that factors may cross over between the X and Y chromosomes, which accounts for some of the peculiarities met with at times. It has been shown that the double-sword factor is actually carried by the female and not by the male, which is a contradiction of what has already been said. The exact part that the female guppy plays in each of the standards is not very clear, but enough is known to make it a golden rule that to maintain the required characteristics you must keep breeding within the strain.

If a pure golden guppy male is mated to a pure grey female all the offspring of the first generation are grey, because grey is dominant over gold. If G stands for grey and g for gold then the original parents are represented by GG for the female and gg for the male; the first-generation offspring are then all Gg, although they appear grey (GG). A direct brother to sister mating will now produce several combinations of hereditary possibilities, which are: GG (pure grey), Gg (which appear to be grey) and gg (pure gold). The apparent ratio in the second-generation offspring will be three grey to one gold, which is the Mendelian ratio of three to one. It must be noted that crossbreeding can never produce a blend or dilution of colour and the offspring will always appear to be of one colour type or another, even though they carry hidden factors.

As succeeding generations follow each other, coupled with selective breeding certain factors become rarer and rarer, but it is always possible for recessive factors suddenly to combine in some particular fish and show a reversion. This may frequently be seen in such varieties as the green swordtail, which produce a pure gold from time to time, showing that gold has been used in their development.

If you have grasped these very elementary facts then you will be better able to judge what particular pairing to make to achieve your objective and know that it will take more than the one generation to produce results. A little genetical knowledge is a very great help in guppy breeding, though not, of course, essential, as many of the very best fish have been produced from selections made by eye alone, without any theoretical background.



Pond in Polythene

by D. NEVILLE WOOD

WE wanted a pond at school; we wanted it quickly, and we wanted it cheaply, too. You may not want to put in a school pond, but as I imagine the same considerations of speed and expense may be important to the ordinary man who would like a pond in his back-garden, perhaps I may tell you about our polythene pond?

We did not want a paddling pool, or even a "biological" pool for intensive study of aquatic life; all we were after was a pleasant small pool to enhance the appearance of the front of the school and to interest the children. A few goldfish, perhaps a rockery, with an imitation waterfall, and maybe we could rig up a hose pipe to give the imitation of a fountain; crazy paving round it, and a few bulbs planted in between the slabs and all for only a few pounds. It sounded fine in theory, but how long would it take and how much would it cost, and probably most important of all—could the teachers and children possibly do the job between them?

When we started to examine the possibilities, there seemed to be three alternatives: a "proper" concrete pool, a precast fibre-glass pool or plastic sheeting.

Of these, the first was obviously the more traditional and normal way of tackling the problem, but it would take a long time, it would not be possible to introduce plants and fishes soon after completion and, for the size we had in mind, it would work out rather expensive, too.

Much more appealing was the idea of buying a ready-made plastic or fibre-glass pool, rather like an irregularly shaped washing-up bowl, and making a hole to take it. Here again we were up against the expense. It is appreciated that this method is probably the least messy, the quickest and possibly the easiest for the less-practical man, but it was really beyond the means of the School Fund at the time, especially if we wanted one of reasonable proportions to make a reasonable show on the front side of the long school hall.

We were, let's admit it, just a little bit suspicious of the

third method—that of digging a hole, laying in plastic sheeting and filling up with water.

Still, we reminded ourselves, the children had successfully got those poor little goldfish home safely from the Fair in little plastic bags, with water in, so it ought to work on a larger scale. We had heard, too, of thousands of gallons of water being stored in plastic-lined trenches in the Fen Country on nurseries and market gardens, without failure, leakage or other complaint!

Here then is the paragraph that really ought to come at the end, as a grand conclusion: we found that this method (a) really does work, (b) gives a result that looks quite pleasant, even in the winter without bulbs, fountains or flowering shrubs, (c) is cheaper than the other, more normal, methods of construction, and, most important (d) required no great technical skill or "know-how" to do it, and do it reasonably quickly.

It is appreciated that there are snags. This idea, for example, is new, or fairly new. So no-one is quite sure of the life of the plastic. However, 3 years is the time stated by the supplier of the sheeting, so, if it lasts just that length of time, it will be quite satisfactory.

Probably the biggest risk, especially at school, is the danger of rupturing the plastic sheeting. Anyway, we have a rule about sharp sticks and stones and so far, at least, that sort of tragedy has not occurred.

The plastic sheeting itself is supplied either clear or black, and just as we were about to decide in favour of the clear, as it was sixpence a yard cheaper, it occurred to us that the black might look more realistic. In fact, this is true, but another illusion which we had not really foreseen, is the effect of depth which the black plastic gives. The 9 inch section of the pool looks well over a foot deep, and at the deepest point, about 18 to 20 inches, you can't see the bottom at all clearly.

The plastic sheeting should be used double-thickness, and ordered with plenty to spare, not forgetting to measure

(with a length of string or a flexible tape) down the sides as well, and also allow about 9 inches all round to weight down with soil, stones or rockery at the finish. We chose to fold rather than to cut our plastic sheeting, which was supplied in one continuous length 12 feet wide.

When the hole has been dug to the required size, it should be lined with sand, free from sharp bits of gravel. This is to form a bed for the plastic sheeting, to avoid a tear at the very start! An inch thickness is adequate, making sure that where the sides are too steep for the sand to hold, there are no sharp protruding stones to rip the sheeting.

Dimensions are, of course, a matter of personal taste, but we feel sure that the usual suggestion of three levels is a good one. The shallow shelf is useful for plants that flourish in a few inches of water, and at the other extreme, there should be one part of the pool 18 inches or more deep for the fishes to retreat to, when the surface is a block of ice. When this happens the ice should not be broken: firstly because of re-freezing, which will make jagged edges under the ice surface to harm the fishes, but also, the old story of the cuts into the plastic may be repeated, so let it melt naturally. Even with the chalky subsoil that we struck 5 or 6 inches down, it was a matter of only a few hours' work to remove the soil, tidy the hole and line it with sand, as suggested above.

Don't take the soil too far away; it can be used, if you wish, partly to build up your rockery around the edge, but also to anchor the sheeting around the pool.

It should also be remembered that water is quite heavy, so when the plastic sheeting is first laid in, it should not be firmly anchored down. Leave plenty of free sheeting to conform naturally to the shape of the hole, and don't worry too much about creases, as they will not disfigure the pool once the water is all in.

Evaporation and rainfall should keep the level of the pool about right. We have not found any fishes stranded on the rockery yet, even after heavy rain! You will notice that I have said nothing about the plants and the fishes, but both are quite fit and well in their somewhat artificial surroundings.

I should add that we were fortunate enough to be given both the fishes and the plants by a kind donor from Finchfield (as a result of a reader of *The Aquarist* answering an appeal published 2 or 3 years ago—for tropical fish, and for another school!) which, of course, reduced the costs of the finished pool considerably. Though we were told that the



The excavation with sand-layered base ready to receive the plastic sheeting



With the polythene pool filled with water, the edges of the plastic sheeting were anchored beneath stone slabs

plants ought to have been allowed to settle into the pool for a fortnight before the fishes went in, this was not possible, so we put them all in together, and so far (6 months) they are quite all right.

The spring crocuses and daffodils are just coming through. The crazy paving is settled in place and, even if we say so ourselves, everything in this particular spot in the garden looks lovely.

I knew there was bound to be a fly in the ointment, somewhere. This morning's mail has a suggestion that I might like to demonstrate how this was done—a group of teachers would help—learn by doing—all in 2½ hours. Gosh! I wish I hadn't sounded so enthusiastic about our PIP, as we call it—our Pond in Polythene!

Cacti in the Fish House

THERE is no secret about the growing of cacti. The same rules apply as to the successful culture of most pot plants. The main reason why plants in pots are lost is that the watering is not understood. During the warmer months of the year cacti grow well if given enough water. Some people have the idea that cacti are desert plants and require little if any water. This is not true, as no plants grow in an actual desert. Most cacti grow naturally in the type of country which we know as prairie. The art of watering is to give enough water at a time to damp all the soil in the pot thoroughly and then to give no more until the soil has dried out completely again. If in doubt it is better to err on the safe side by refraining from watering for another day. Most plants show by drooping leaves that water is needed but as cacti have no leaves their wants can be more difficult to notice. If a large pebble is left pressed into the top of the soil of a pot it gives a good indication of the state of the soil, for if the soil under the pebble is still damp there is no need to water.

Breeding Twintail Goldfish

by E. KNIGHT

BREEDING of twintail goldfish is not difficult, but it is the endeavour of many and the success of a few. The result of one's efforts depend on a number of factors, both in the breeder and in the fish. Of one thing I am certain: that patience, and complete interest to the degree of obsession, must be the virtue of the breeder if he is to be successful or is to attain reasonable results. There is no short cut, much less a short period in which to attain the twintail ideals.

In the fish there are three main characteristics: a good deep body, standard finnage and good or reasonable colour. This is a lot to expect of a variety of fish that almost does not breed true, meaning that only a few young fish will possess the characteristics of one or both parents. Whether they survive is entirely subject to the conditions the breeder creates. Maybe the fish he has bred were able to reach only the embryo stage before being attacked by some parasite or bacterial infection, or some other of the ways in which an alevin can be prevented from reaching the free-swimming stage may have been responsible for losses.

How often have we heard the remark: "I had two perfectly good-quality fish as the spawning pair (perhaps prize specimens), yet they produced a lot of trupe!" On the other hand: "I had two mediocre fish, and they produced some good-quality youngsters." It is the fish that are blamed or praised as the case might be. Could it be the conditions? The hereditary factors? The truth is that it might be one of any number of reasons, and it is this uncertainty that makes coldwater fish-breeding so interesting and worthwhile.

Only a modest sum need be paid for a pair of reasonable quality fish, or a trio of 2 years-old fish, from a breeder who has the well-being of the hobby in mind rather than

monetary gain. The twintails with long broad caudal fins and with the other fins in proportion will, without doubt, fetch a higher price, but the short-fin variety (known as the fantail) will be found more active and equally as attractive as the former, which are highly developed. However, the long-finned specimens lose their beauty and attractiveness after 3 or 4 years for the reason that their high dorsal fin invariably folds over, and their movements become restricted by the excessive caudal fin development. During the first 2 or 3 years of its life the long-finned variety can look a very handsome fish indeed. But few will possess fish conforming to the high standards laid down.

The attractive short-finned twintail might be adopted, which can possess the same colours, a good rotund body and shorter but sturdier finnage. What is more, the fish does not lose its deportment so early, if at all, and is always active throughout its life.

How to select the fish

First, look for a deep short body, because this characteristic is essential for twintail fish of either long- or short-finned variety. Many twintails have good finnage and perhaps good colouring but have an elongated or shallow body, which gives the fish an out-of-proportion, and even ridiculous, look. The body is most important and should have as nearly as much flesh above the lateral line as below. The finnage should be near to that of the Goldfish Society of Great Britain standard for the twintail, or to the short finnage of the Federation of British Aquatic Societies standard fantail. The anal fin should be divided or paired and the colour as laid down in the standards for each fish. If a buyer is able to purchase fish with two of these characteristics he will be fortunate. This will be sufficient reason to want to breed your own fish, though the great majority of them will be deficient in some way. However, it is possible to obtain a good body and finnage near to the standards, but with a variety of colours; from matt white or pink to perhaps three colours, to the varied combinations of the nacreous fish.

It would be to advantage if the trio purchased were a female and two males. Bearing in mind the need for a deep body in both parent fish, the female should possess the darker colours, and one male a bluish colour with some black mottling, or some black; the other male should be an orange or red with black mottling. The finnage must be of the same variety in all the fish. The varieties should not be crossed! It is an excellent idea to breed one variety of fish, for to breed both twintail varieties will require a larger establishment, particularly if "line-breeding" is the aim, as I think it should be. With just one pair of fish, two breeding seasons must elapse before crossing back to the parents, and it will be found that a large number of fish must be reared to make a good selection. Space will be at a premium. It is here that most coldwater fish-breeders go wrong, by carrying too much stock.

It is an interesting experiment for one of the males to be a bronze metallic; if it is bred to a matt fish all the young will be nacreous, with some of them having attractive colour



W. J. HOBBS

A prize-winning coldwater furnished aquarium. Such a set-up is not suitable for use as a breeding tank.



Photo

Lawrence E. Perkins

Bunches of *Myriophyllum* can be used in spawning tanks.

variations. Whether a pair or a trio are used for spawning, they will produce, in the first two spawnings, sufficient numbers of young fish for the great majority of aquarists to rear. I suggest that the first spawning should be in April, during the second fortnight, for as often as not there is a spell of fine weather at that time of the year, even if it is for only a few days, and the fish seem to sense this. The second spawning can be at the end of June. Thus a fair period of some 6 months is available in which to rear the young fish to a final selection. But ruthless culling must take place after the first month.

Housing the Breeding Stock

Let us assume that we have a very modest fish house, be it a shed with some daylight entering, say by a side window, or a greenhouse that is used as a fish house. Top light only is necessary; this will help prevent excess of algae in the aquaria. For a greenhouse a doretemper called "Summer Cloud" (purchased from ironmongers) can be pasted over the outside, up to the eaves, but if the building receives the full sun all day the roof, right up to the ridge, should also be given a good even coat (abide by the manufacturer's instructions for mixing). This treatment will give a very pleasant light-green tropic effect from the inside of the fish house. Plants seem to thrive in the diffused light. One disadvantage with a greenhouse is that during the summer months a rapid rise in temperature will be experienced at times, which can harm the fish. However, if doots and vents are kept open and a trickle of fresh water is allowed into the tanks distress to the fish can be prevented. I have found a brick-built house with a side window to be the ideal set-up. Light can be supplemented artificially, and, of course, controlled.

I would suggest the 36 in. by 18 in. by 18 in. aquarium as the minimum size for coldwater fishes. If larger

tanks can be obtained, so much the better, for space or water area is the problem, rather than volume. My own fish house has as a top range of tanks, three 48 in. by 18 in. by 18 in. tanks and, underneath, three 44 in. by 24 in. by 12 in. (deep) rearing tanks on a 1½ in. angle-iron staging. All six aquaria are of ½ in. plate glass. The much cheaper "wired" glass can be used for the back and sides, but clear plate should be used for the bottom and, of course, the front.

Shingle and compost is not necessary in large tanks, and is in fact impractical, both because of the enormous amount required and the prolonged exacting work entailed when cleaning them out during the breeding season. The few aquatic plants can be grown without a bedding medium, by weighting them in bunches and placing them in shallow clay pots with gravel. The decorative effect is enhanced if a carpet of algae is allowed to form on the bottom, and around the back and sides, serving as a green food for the fish when they are hungry. Crystal-clear water will result, provided that dried foods are not used as such.

Winter Treatment

In the winter the fish are usually resting on the bottom or perhaps moving around a little. These movements, over a period of weeks, along a slightly coarse tank bottom or one where shingle and compost is employed, will tend to chafe the fish's underparts, especially around the pelvic and pectoral fins, and produce sore red patches. In tanks where a clear plate-glass bottom is fitted there is never any trouble. The wired-glass bottom in a tank I found to be very rough when running my hand over the algae-covered base, not unlike a sandpaper surface. Hence I dispensed with compost and used aquaria made with a clear plate bottom. Half-inch pebbles only were packed into the clay pots, and root plants entwined there and took hold, thus anchoring them; *Myriophyllum* grows beautifully this way.

This modest set-up enables the breeder to bring his stock indoors for the winter, into a cold fish house, but not where freezing can occur, for the safety of the glass aquaria is as important as the needs of the fish, without coddling the latter.

During the months of January and February and sometimes into March, depending on the length of our winter, a 100 watt immersion heater is placed in each of the lower three large (44 in.) tanks (a 40 watt heater can be used in a 36 in. aquarium). This keeps the temperature in these tanks around 40°F and prevents the upper range of cold tanks from freezing; their temperature is around 36-38°F.

The adult fish remain quiet at these temperatures, and require no food unless there happens to be a few mild days, as often will be the case during winter in the south. When the fish are seen swimming around the water temperature is often about 45°F and a little chopped earthworm is given. The temperatures of the lower tanks will be proportionately higher, therefore the young fish in them can be fed twice, perhaps three times a week. The next winter, they in turn will be housed in the upper tanks. Apart from this, twintail goldfish do not require any additional heat during winter. If a routine such as described is carried out, there is no reason, other than the failure to provide an earthworm diet, why the aquarist should not have early spawnings.

The problem of the breeder at the end of February is to obtain sufficient earthworms for conditioning the fish. To be sure of a supply he can build a compost heap made of these layers: grass cuttings, kitchen vegetable waste, earth and dead leaves, more grass cuttings, lighter deciduous garden materials that will break down easily, with a paifful of cow dung well mixed into these, then more vegetable waste and cuttings; the whole is turned over occasionally and kept damp. If this is started in late summer, by

springtime a good culture of earthworms will be the result, provided that some large earthworms with prominent "saddles" are spread over the heap at intervals. These will breed amongst the rotting vegetation. A large old garden frame would be ideal for a worm patch, as this could be covered in very wet and frosty weather.

Breeding Time

At the end of April the fish will be much more active. Besides the earthworm diet, a cooked mixture can be made to give them a little more "body" and variety without constipation or digestive troubles. In a small receptacle (I use a small enamel cup) put two teaspoons of porridge oats, cover this with water and boil for 3 minutes. Then add a little meat extract (Bovril or Oxo), a heaped teaspoonful of a good proprietary food, a heaped teaspoonful of dried shrimp and cook this mixture to a stiff pudding. When cooled it will have a gelatinous quality, so that when fed to the fish it will not break up and scatter all over the tank as dried food will normally do. (This is the cause of many water troubles, in both coldwater and tropical aquaria.)

The white nuptial tubercles will now be observed on the gill plates of the males, and they will also appear on the front rays of the pectoral fins. At the same time the females will become distended, usually to one side of the abdomen, with ova. These characteristics can help to sex the fish quite early, coupled with their behaviour, when the males are seen to nudge the females in the vent region occasionally (but do not let this be the yardstick, because two males will act similarly). I think that the specific way to sex goldfish is by the tubercles on the pectoral fins of the males. They can be sexed out of season in this way by the use of a magnifying glass; if the breeder observes the front ray of the pectoral fin of the male, it will be seen to be thicker than in the female, and slightly serrated.

Earthworms and the food mixture already described, varied with scraped raw beef and liver, can be given all the year round when temperature permits feeding. *Daphnia* and *Cyclops* when in season are given to the young fish, also mosquito larvae, which they seem to relish avidly. If enough of these larvae can be netted for the adults as well, this will help to keep them active, but large quantities are required. It would be better to spread the catch among the young fish, where it will do the most good.

If the sexes have not been separated by March, this should be done then. Place them in separate tanks, or use a partition in their tank, either of glass or a polythene-covered frame. Should the water temperature remain steady in the lower fifties, which it invariably does by the end of April, and if the fish are well conditioned, the breeder can expect his fish to spawn. I have had very good spawnings when the temperature was around 52°F.

I have noted that a settled spell of weather can be expected around the second fortnight of April or the first week in May, perhaps for only a few days, and it is then that the breeder must prepare the spawning tank. The plants are collected: *Myriophyllum*, willow moss or the *Elodea* types, in fact any water plants that will, when bunched together, form a loose mat to catch the eggs, but which have sufficient "give" to allow the fish to swim through without tearing their fins. Place the plants in a pail of water into which has been stirred two teaspoons of Dettol. Remove the plants after 5 minutes into fresh running water for about an hour. Prepare a sea-salt bath in another container, the solution to be of a strength of 1 ounce of sea salt (this can be obtained at most large Chemists) to the gallon and at a temperature equal to that of the tank water from which the parent fish will now be taken. Immerse the fish for an hour in the sea salt solution, then remove them to the spawning tank.

When *Myriophyllum* plants (which I use) are weighted at the ends of the stems, the greater part of the plants float in the upper volume of water. On looking through



Photo: Laurence E. Perkins
Willow moss (*Fontinalis*) is another plant suitable for use in spawning tanks.

the front glass, a number of spaces between the bunches can be observed. It is into these spaces that the spawning fish will often make their way, with the result that many eggs sink to the bottom; these, of course, will be lost if the plants only are removed from the tank for hatching the eggs. However, if a few pieces of plastic airline, cut to the width of the tank, are weighted and placed on the floating plants, the whole will sink and form a loose mat on the bottom of the tank, leaving 3 or 4 inches of swimming room for the fish; this will save many eggs that otherwise would sink to the bottom. Glass tubing will serve the same purpose. If lead weights are used, cover them with raffia strips to prevent damage to the parent fish during the vigorous "drive." I made the mistake of using uncovered lead weights once, with the result that two of my best fish suffered wounds.

If the fish are removed after spawning, leaving the plants in the tank with all the eggs, the drawback is that the thousands of dead sperms which did not enter an egg can produce pollution and harm the fertilised eggs. On the other hand, all the eggs, whether adhering to the plants or the many on the bottom, have a chance to hatch out if fertilised, in this method, and some of those on the bottom may well be "the fish in a thousand" we are hoping for. Although we lose these by removing the plants and eggs after spawning, I favour this method. The plants, after the spawning, are placed in another clean prepared tank of tap water about a week old. The adults can be separated by a partition in the spawning tank, and the female removed to another "female" tank and fed liberally with earthworms etc.

(To be continued)

Water Lilies for the Garden Pool

by LAURENCE E. PERKINS

Photographs by the author

ANY plan the pond owner may have for beautifying his pond by the addition of water lilies should be put into action now if the plants are to settle down in their new surroundings and provide a show in this, their first year. In making the selection there are three factors which will control individual choice.

Colour will come first followed by area and depth(s) of the pond concerned. The four main representative colours among water lilies may be obtained in various varieties suitable to a range of depths so that the size of one's pond, even if it is a very small one, need not deprive the owner of the pleasure of owning at least one lily. Before giving details of those varieties which may be recommended it may be as well briefly to outline treatment in general for water lilies.

They are best planted in pots in a mixture of loamy soil and old cow manure. If the soil level is kept to within 3 inches of the pot top and large stones of the size of a potato are placed on top of the soil there will be little risk of the lily being uprooted by the pull of the floating leaves and less chance of the fish disturbing the soil to the detriment of the water's clarity. If the size of the pond offers a choice of siting for the lily the incidence of shade from marginal plants or neighbouring shrubs should be avoided so that the lily will receive as much sunlight as possible.

During sunless days most lilies will not open at all and any reduction of sunlight will also result in fewer blossoms. Our summers are often more than short of sun so that the lily should not be robbed of its due amount by poor positioning.

Many varieties produce large numbers of leaves and it is advisable to remove one or two from time to time when there are signs of them becoming too numerous, for, apart from wasted nutrition which the lily can more gainfully use to produce blossoms, the condition of the pond relies upon its surface area for oxygenation and it doesn't require many plate-sized leaves to reduce the area of the average garden pool to nil. When the blossoms have finished blooming they should be removed to save waste of the plant's energy, which will otherwise go towards nourishing the forming seeds. This is, of course, unless one feels disposed to undertake the frustrating task of producing water lilies from seed!

Now for the choice of varieties. The main colours come in shades of red, pink, white and yellow and size of blossoms from as small as 2 inches across to as large as 9 inches.

Dealing with the small pool first, we may choose from those which are suited to depths of from 9 inches to 1½ feet. The choice here will include the well-known pygmy lilies, which are really small with equally small leaves and which can be adequately supported in a tub of water. In this



Marliacea rosea: rose-coloured blooms of deep hue when the plant is established.



Gladiolens (variety of *Nymphaea alba*): large snow-white blossoms with golden centres.



James Brydon (variety of *Nymphaea alba*): rose-carmine red blossoms, a popular lily for garden ponds and one that will tolerate shady conditions



Escarboucle (variety of *Nymphaea alba*): large crimson blooms are freely produced



Attraction (variety of *Nymphaea alba*): red blooms are formed by this lily, which grows in water 2-3 feet deep



Sirius (variety of *Nymphaea alba*): crimson blooms with rose-red patches and golden centre



Froebel (variety of *Nymphaea alba*): blood-red blooms form on this lily, suitable for the shallow pond

category are *Pygmaea alba*, which has star-shaped little blooms of white, and *P. helvola*, which produces bright pale-yellow flowers. For red we have a choice of four popular varieties: *Froebel*, which bears many wine-coloured blooms, *Laydeckeri fulgens* with freely produced bright-red blooms, *L. lilacea* with scented blossoms of very deep pink and *L. purpurata*, whose flowers are deep red, deepening in colour during successive days. Among the pink shades for these shallow depths *Firecrest* is the most brilliant, having fairly large blooms of bright deep pink, which are produced in quantity.

For depths of water up to 2½ feet, *Martiana alba* is a good choice for a white. It freely produces snow-white blooms which stand above the surface. Colonel A. J. Welch is a good yellow variety having bright star-shaped flowers which stand clear of the water. *Martiana rosea*, with pale rose-coloured blooms with orange stamens, and *M. carnea*, with delicate pink blossoms, provide alternative choices for pink lilies suited to medium depths. Among the reds we have a wider scope, which includes some of the most popular of all the water lilies. *Escarboucle* is so well known that it needs little recommendation. Among the most expensive, it nevertheless provides excellent value both in the number of blooms it produces and in the richness of their coloration. James Brydon ranks second to *Escarboucle* in popularity and is sufficiently different in its colour of rose-carmine and in its distinctive cup-shaped blooms to be able to share a pond with *Escarboucle* where space permits. *Sirius* is a beautiful lily with blooms of large size, crimson in colour paling to pink at the tips and with golden stamens.

For depths of 2 to 3 feet we can draw from a choice of the largest lilies available. Among the whites are two, *Virginalis*, which has enormous pure white blooms produced in large numbers, and *Gladstoniana*, which has large snow-white blossoms with golden centres. *Dracloeyi rosea* makes a good choice for a rose-pink lily and is another which carries its blooms clear of the water. *Attraction* has huge purple-crimson blossoms with lance-shaped petals, which pale off to pink at the tips.

Wherever possible it pays to visit a reputable nursery at the time when their lilies are in flower so that choice of colour may be accurately made. Should it transpire that the lily or lilies which most appeal are suited to shallower depths than are to be found in the pond for which they are intended, it is a simple matter to arrange for the planting pot to be brought nearer the surface by standing it upon

another such pot placed upon the pond bottom in an inverted position. If the fancied lily is for greater depths than can be provided the solution may not be so simple, but the disparity may be only a matter of inches, in which case the result will merely be that of wider spreading of the leaves; but the area of the pond should be considered for it may not be sufficient to permit such spreading without the pond having an unpleasant overcrowded appearance. With the very wide choice available, however, it shouldn't be difficult for the individual to satisfy his requirements.

Hints on Pond Construction

(continued from page 255)

new section will not join up properly, and a crack will form there later on.

If a raised-sided pond is to be made some bricks or paving slabs will have to be used to avoid the use of shuttering. Once the walls are built up the concrete coating should be applied thick enough on the inside to make a good water-tight job. The top of the wall can have a ledge of tiles to overhang the outside slightly. This overhang will prevent snakes, frogs, toads and newts from entering the pond. If pockets for plants are required these can be moulded in position on the sides of the pond with fairly stiff concrete. These can be dispensed with if separate containers are used for plants. By using these it will be found much easier to clean out the pond.

Any modern type of concrete can be used as long as it is quite fresh. It is possible to use ordinary cement in a mixture of 1 part to 3 parts of sharp sand to make a concrete that will hold water when only half an inch in thickness. If the concreting is done in dry weather see that it is sprayed at least twice a day so that it does not dry out too quickly. This work should not be done in very frosty weather. Once the concrete is dry it must be well scrubbed round to remove the free lime, which could be dangerous to fishes if left. The more shallow the water the greater is the danger as there is then a larger surface of concrete to the amount of water. Leave the pond filled with water for a week and repeat the cleansing. Do not be in a hurry to put your fishes into the pond but see that some water plants are growing well first. Care in construction can save many headaches later on.

Hints on Pond Construction

by ASTILBES

THE general rules for pond construction are fairly well known but there are a few snags which can be overcome if care is taken before the job is commenced. The position of the pond is very important, but this is often governed by the shape of the garden. It is a help if the pond can be sited near the house, as water will be easily available. It should be on the highest part of the garden if there is any rise in the ground so that emptying is made easier. The pond should not be located under or too near to trees or large shrubs. For one thing there may be too much shade and then there is the trouble which may be caused by falling leaves. If the pond can be made where it will receive some sunshine it will be an advantage; although too much sun can be shaded out when necessary it is impossible to give the pond some sun if it is badly placed.

The shape of the pond may be decided by the type of garden. If the lay-out is a formal one then the pond should conform to this as much as possible, and can be circular, oval, square or oblong. If there is sufficient space a very good shape is in the form of a cross, especially if one arm can be longer than the other. This type enables one to construct partitions so that any one of the four arms can be isolated from the others to accommodate small fishes or those which might not agree with the others.

A few sticks should be used in the ground to mark out the shape and great care must be taken with the formal design to see that everything is geometrical: right angles and circles must be exact. Measure from opposite corners to make sure of this; unless these measurements coincide the corners will not be square. A spirit level is essential and can be used in conjunction with a long straight board. Pegs are driven into the ground and the tops levelled off so that when the concreting is done all the edges will be of exactly the same height; otherwise, when the pond is filled, the surface of the water will look very wrong if uneven with the top of the concrete.

When excavating the soil for the pond a considerable pile is formed. Generally this can be heaped to one side of the pond and later made into an attractive rockery. One side of the pond can be left low so that a bog garden can be constructed there when the pond is finished.

Two feet is quite sufficient depth for the finished pond, and as a matter of fact 6 inches less will be all right. The deeper it is the harder is the work of excavating and the heavier the cost for concrete. It is only for the stronger-growing water lilies that an extra depth is needed. Most of the best lilies for the medium-sized pond need water no deeper than 18 inches. What of the fishes in a shallow pond? Many writers have stated that the pond should be either 2 or 2½ feet deep, the latter being the favoured depth. It is said that fishes will not go through the winter unless part of the pond is 2½ feet deep. I do not agree with this as I have proved that even young goldfish under an loch in



Photo:

W. J. Hoorn

Natural rocks, ornamental shrubs and ferns provide an informal setting for this "bridged" garden pond

length can go safely through the winter in the south of England in water 8 inches deep.

In the deep pond during the winter, when most oxygenating plants are dormant, the water near the base of the pond is sure to be rather foul. The top area will be much better oxygenated owing to the fact that it is in contact with the atmosphere. This top water will keep pure, but the deeper the pond the harder will it be for the water at a depth to receive any fresh oxygen.

After excavation the next task will be to consolidate the base of the pond by ramming in half-bricks, stones or other coarse material. Don't hurry this job, as the firmer the base the better will the concrete remain stable. Many writers have recommended the use of timber for forming the sides of the pond but timber is so expensive nowadays and can rarely be used for anything else afterwards that it is quite a luxury and at the same time quite unnecessary. Shuttering need not be used at all as long as the sides of the pond are not made perpendicular. Any shape of pond can have the sides sloping at an angle of about 45 degrees. Perpendicular-sided ponds are quite unnatural and even a square-shaped pond can have the sides sloping. The concrete can be floated up the sides with little trouble and the cost of shuttering is saved. The thickness of the concrete will depend on the size of the pond. A fairly small pond can have 3 inches, whereas a large pond may need 6 inches in thickness. Reinforcement can be used, especially at any corners, and this can be old bedstead laths or rails, or stout galvanised wire can be used.

If two coats of concrete are used see that the first is very coarse and not too wet and that the second one is added before the first gets too dry. The top coat is better if laid on fairly quickly, as if part is laid and then a short time is allowed to elapse before carrying on it will be found that the

Please turn to page 254

AQUARIST'S Notebook

by

RAYMOND YATES



IN the November issue last year I referred to the Home Aquaria Competition run by the Merseyside Club and mentioned that, as far as I knew, this was something of a new idea. I was not too surprised when the brickbats began to arrive—from north, south, east and west. It seems that this type of competition has many adherents all over Britain, although the rules vary. Inverness Club has already set out its system for the benefit of readers in the January issue. However, there are plenty more enthusiasts who have kept me posted with details of their methods. The Northampton Society have held these competitions for the last 14 years. Originally only six entries were received; nowadays about 30 annual entries are the rule. The best entry each year gets a cup; judges (two) are engaged from another society to eliminate any possibility of favouritism. The Sheffield Club have had four annual events of this nature. Again a cup is awarded with a replica for the winner to keep. Canterbury Society has been running a contest of this type for 11 years: points are awarded for cleanliness, health and condition of fishes and plants, also the compost. Judges will advise members (if asked) how to improve their set-up. The judges are liable to visit the home of a competitor at any time in the year, no notice of an impending visit being given. A cup (and replica) is awarded annually. The Nottingham Club are no strangers to this type of event but I have no details.

Brockley and District Breeders' Circle run an annual contest and they tell me that the winner for the last 2 years (Mr. R. Dwyer) has already set up his tank for this year's entry. Shortly before the competition is due the club holds a discussion on the subject so that all members can be sure of the way in which tanks are judged and the points a judge will look for when he visits the entrant. The now-defunct Forest Hill Society ran these competitions for several years, mainly with visiting judges from outside the club. Several years ago the three clubs of Forest Hill, Lambeth and Pisces held an inter-club event, each putting up its best tank and these three winners were then judged independently. The winning club was Pisces; the judge was from the Friends Aquarist Society. If I have failed to mention any others who contacted me, my apologies. All interested will see that Home Aquaria Competitions are not confined to Merseyside, but this last club must take a bow for publicising its venture and telling other aquarists about it. If your club engages in anything out of the usual please broadcast it for the benefit of other hobbyists and to put them on to a good thing.

A newspaper report on a recent meeting in London of The Royal Institution mentions an unusual guest who wore a Terylene and nylon jacket with a zip-up side and lace-up back. This was Rupert, a 2 years-old seal, which was captured in the Wash and now lives on the roof of the London Hospital Medical College. He was taken to the meeting by Dr. R. J. Harrison, Professor of Anatomy at the Hospital, who told a reporter of his experiments on diving. Rupert is one of many seals which have taken part in the tests, the object of which was to find out how long and how deep seals could dive, and then to find out whether they had any special features associated with deep diving. It had been found that when a seal dived its heart rate slowed from 120 beats a minute to between 4 and 10, which would kill a human being. A seal did not hold its breath when diving, as man did, but breathed out. Seals could drink gallons of sea water without ill-effect, and scientists wanted to know why. Seals also manage to

time the birth of their young so precisely that all baby seals born round the British Isles had their birthdays between 16th and 18th June.

During the Christmas season the midnight depredations of Santa Claus can be expected to produce a few surprises. One of these was the report of the arrival down the chimney of a large begrimmed but very much alive goldfish. Things do come down the chimney besides soot and rain and I have had to put up with the fear-crazed antics of what was certainly a very black bird—but goldfish, of all things! The suggestion is put forward that this unfortunate fish was carried from a private pond and dropped by an owl, and this seems as likely as not. Although owls abound in my own locality, and in fact used to use the garden opposite as a headquarters, I have never heard of anyone who has had losses from ponds which could be placed to their account. In the north we see little of the heron but enormous flocks of herring gulls now live around all large towns. It is true that gulls in towns are nothing like so tame as at a seaside resort and they seem to frequent open fields which are little used by man. They fly high, never anything like rooftop height, so that a tiny pond is more likely to be overlooked, but one feels the risk is there. Has any pond-owner had trouble with gulls well inland, or owls either for that matter?

In a club magazine recently I was amazed to read an advertisement from a hobbyist who wanted dead fishes. Yes, stark, cold and dead. Corpses (3 inches or more if at all possible) were wanted for dissection and not for building up some monster in the horror-film manner. Talking of films, an advertisement one can look at without boredom depicts, in full colour, a tankful of orandas, moors, veiltails and lionheads. The product? A brand of fish food.

Having had a protracted period of being rather "off colour" I am afraid I have found little time for active fish-keeping. My few fishes had to make the best of a bad job and for many weeks had to put up with no service of the tanks and a very rough and ready diet of whatever was available, usually from the table. When you just can't do anything you cease to care, and I didn't bother myself unduly although I had tank lights on as usual and ran aeration. The plants grew and filled the tanks (so it seemed) and the mass of blue-green algae which formed fairly early on disappeared as if by magic. The fishes prospered and the longer I left everything the happier they seemed. To me this was in its way a salutary lesson because I have always been a clean-tank fan. Probably those of us who are always cleaning and changing could do with a protracted lay-off to make us realise just how un-necessary much of our labours of love are.

Florence Leiter, writing in the American society magazine *The Sealers*, reports repeated success with breeding neon fish. She gives the following pointers to be followed by others wishing to succeed with this dainty fish. A clean tank, sand, plants and fresh water are prepared to start, with water 6 inches deep, on the acid side, and filtered for 3 days. Temperature 76°F. Several clumps of shortish plants are used. The tank is darkened to twilight hue and

the fish (a trio of two males and one female or a pair) are added; if sexes are not known all the fish are put in. Remove all fish immediately after spawning. Egg hatching occurs in 2 days. Feed Infusoria for first 10 days, then start with brine shrimp. After this stage it is plain sailing. A 3 gallon tank is ample as it is easier to use Infusoria and brine shrimp in one this size. No direct light should reach the tank until at least 5 days after spawning.

In a recent Bulletin of the Goldfish Society of Great Britain some good suggestions are put forward for the use of polythene sheeting, namely, for lining fish house roofs to insulate against extremes, to cover ponds to retain heat, and to line old, cracked or leaky aquaria so that they can be used to contain fishes in an emergency. It is also described in some detail how a member made a polythene pond. Having excavated the hole he lined the bottom and sides with old linoleum covered with an equally old blanket. This was to prevent rough surfaces, stones or roots pushing through and puncturing the polythene. Reference is made to any punctures being patchable with another piece of polythene and any good-quality waterproof adhesive. Readers will remember that I went through all this long ago and even managed to patch successfully 18 holes, some several inches square with the aid of Evo-Stik and double-sided patches. However, my experience was that 12 months is about the limit of the patches; after that they peel off themselves underwater. The article also mentions that polythene deteriorates in time from the action of ultraviolet light. It certainly does deteriorate under

water but it becomes so dirty and stained that it is quite impossible to tell after 2 years just what condition it is in below the surface. It is useful for a temporary pond, or for experiments but for anything permanent it is unsatisfactory. The author also refers to a plastoglass material, which is fibreglass sandwiched between two layers of plastic sheeting. When available to "do it yourself" fans this will be "just what the hobbyist ordered."

A goldfish convention held at Chessington Zoo proved that there is a strong demand for quality fish both from members of the Goldfish Society and from non-members. An annual distribution is not enough, and in future controlled sales of surplus fish will take place at various quarterly meetings. Some late pond spawnings have been reported by Miss D. Morris in the Bulletin, these taking place on 4th and 5th October. Surface temperature was 60°F; the first female was a 3 in., 30 month-old fish that had also spawned in May; the second female was 6 in. and 11 years old. The only known stimulus was the fact that six adult fish were returned to the pond on 2nd October and then well fed on worms.

An interesting technical paper has been issued by the Goldfish Society on Japanese goldfish and their culture about 1900 A.D., written by the late Dr. R. J. Affleck from notes by Dr. Masubara, of Tokyo, made in 1908. Much is still of interest to to-day's hobbyist, particularly those who operate on a small scale and with limited accommodation. Numbers of males and females, feeding, size of ponds, sorting, grading, rearing—all details are included, and this is something worth reading.

The Variable Platy

by JACK HEMS

THE coloration of *Xiphophorus variatus*, as may be gathered from its trivial name, is very variable and, though the females lack bright colours, males collected in their native fresh waters of eastern Mexico often sport yellowish to green-blue sides, red or orange throats and tails and red or canary-yellow dorsal and caudal fins, with or without dark edges.

It is from such attractively coloured wild fish that breeders in Europe and America have developed, over the past 30 years, the sunset *variatus* and other charming yellow- or orange-bodied strains. Until a few years ago, *X. variatus* was referred to as *Platypecilia variata*, but nowadays the generic name of *Xiphophorus* covers both platys and swordtails.

X. variatus is a hardy fish and will stand temperatures in the low sixties, though normally it should be kept in a range of 70°-78°F. It will eat any type of live or dried food, but needs vegetable matter, such as algae or duckweed, included in its diet. It likes thickly planted, clear, soft water and bright surroundings. If it cannot be accommodated in a tank placed close to a sunny window, then

electric light must be substituted to keep it in good health and breeding condition.

The male is a persistent wooer and does not give the female much time to herself. As a result of his ardent attentions, several dozen fry are dropped by the female every 6 weeks or so throughout the year, though a prolonged low temperature will lengthen the interval between broods.

Although parent fish fed on plenty of live food are disinclined to eat their young, it is a good idea to transfer the male to another tank before the babies are born, and to move the female immediately after the happy event. It is easy to tell when the young are about to be delivered by the dark and swollen appearance of the female's abdomen, particularly in the region of the vent.

It is not wise to net a female just before she drops her young because any excitement at this time may result in her death or in deformed or still-born fry being produced. The tiny fry dart about in the surface vegetation and look for food soon after they are born. They are easily fed on flour-fine dried food, micro worms, brine shrimps or similar items. For several weeks the fry look just like smaller editions of their unglamorous mother but, before 3 months have passed, the males will start to colour up and develop the typical thorn-like anal fin or gonopodium. Young males often show a dark spot in the anal region as in a gravid female.

Like the majority of livebearers, *X. variatus* is an inoffensive fish and adds charm and gaiety to a community tank, but, if you wish to keep a strain pure, you must not place a female in the company of other male platys or swordtails because they will mate with her.

The offspring of such matings are often splendidly coloured but sometimes lack the features most admired on the maternal side of the family. Nevertheless, in the hands of capable and visionary breeders, experiments in hybridising *X. variatus* with varieties of *X. helleri* or *X. wurdakianus* often result in excellent fishes being produced.

our readers



write

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

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

Correspondents Wanted

I HAVE received a great deal of enjoyment from your excellent magazine since I began to read it 2 years ago and it occurs to me that it would be quite in line for me to tell you so.

It would be pleasant to write to one or more British fish-keepers and to exchange experiences and literature on fish-keeping. I shall be most happy to exchange American fish magazines and books, or for that matter American magazines and books on any subject, for British books and magazines published in the past that I do not have.

A. WINDSOR,

210, Minnie Street, Godfrey, Illinois, U.S.A.

Fish Dropsy

IN the January issue of *The Aquarist*, on page 211, L. C. Dawson states "Care should be taken not to feed with too many white worms, as there is a suspicion that these cause dropsy." I shall be glad to know what substance there is for this statement and whether the writer has any proof that this is so. I understand that dropsy is caused by a rod-shaped organism known as *Chromobacterium piscium*. I do not see how the white worms can be carriers of this germ any more than any other food. I have used white worms as food for my young fantails for many years and use it exclusively throughout the winter months. I have never had a fish with dropsy. If there is no proof for the writer's statement it should be refuted, otherwise many aquarists may cease to use what I consider to be one of the safest live foods and the easiest to breed.

A. BOASER,

Ruship, Middlesex.

MR. B. PLANT in the January issue of *The Aquarist* claims a possible cure for dropsy on the strength of only one test case. On page 92, lines 5 to 9, in *All About Tropical Fish* by Derek McNerny and Geoffrey Gerard this method is mentioned as sometimes giving temporary relief but usually only for a month or so.

T. KIRK,

Kingston-upon-Hull, Yorks.

Long-term Aquarium

I FOUND Mr. B. Popland's article on the long-term aquarium (*The Aquarist*, January) extremely interesting, as I have established a similar tank myself.

Several months ago I became aware of a growing disparity of size amongst my fishes, which, apart from producing the usual results, detracted from the general

appearance of my two main tanks. So the "big uns" went "up top" and the "tiddlers" were put "down under." By experimentation over a period of time, I have managed to strike a balance between fishes and plants.

Has Mr. Popland considered the anabantids? The larger species are quite capable of fending for themselves amongst the cichlids. My own tank contains the following selection of fishes: a pair of firemouths, a pair of blue scaras, two kissing gouramis, a fully grown blue gourami, one *Merymmis*, a tiger scat (3 in.) and two scavengers: *Corydoras julii* and *Gyrinocheilus aymonieri* (the latter being especially useful on the plant leaves). A gravid female guppy is also included to supplement the live food!

The fishes behave quite amicably although a certain amount of "horse play" is natural. The "pecking order" is interesting, bearing no resemblance to fish size, date of purchase etc. The blue gourami chases the firemouth (who have claimed a "territory" for themselves) and the kissing gouramis, but is chased by the blue scaras, who in turn defer to the firemouths. The latter work as a team and often one will make a frontal approach whilst the other carries out a flank attack on the unwelcome visitor. I realize that none of the fishes will grow much larger under their present conditions, but all seem quite happy and I am content to maintain the status quo.

Plants provided many problems. The firemouths uprooted the smaller varieties, the *Merymmis* devoured giant hygrophils and the scat ate everything! The only solution appeared to be strong-rooting, quick-growing vegetation. I had previously found that the use of loam renders re-landscaping difficult, therefore the plants were set in plain compost. A sub-gravel filter, besides increasing the life of the set-up, ensures that roots receive adequate nourishment. The plants used were various forms of *Vallneria*, with top cover provided by Indian fern and *Najas*. Lighting at 30 watts per square foot for about 7 hours daily appears enough to stimulate good growth. Leaves now grow at least as fast as the scat can eat them, and the runners provide a well-rooted plant system that resists the cichlids' attacks.

Feeding requirements are normal, but, in addition, a stone covered with dried spinach purée is placed in the tank each day, mainly for the scat although the other fishes also seem to enjoy it.

Like Mr. Popland, I am now searching for the rarer types of fishes, in my case a butterfly fish, and a mate for the blue gourami, which is full of spawn! One final word of warning: Mr. Popland mentioned orange chromides. I have a pair but they are with the smaller fishes as the

firemouths chased them continually and they spent the whole time hiding in the plants at the back of the tank.

PLT. LT. J. R. PENLEY-MARTIN,
Riseley, nr. Bedford.

Cats and Fishes

I WAS interested in Mr. Guppy's article (*The Aquarist*, January) about cats taking fish. About 4 years ago I inadvertently left my coldwater tank uncovered. On returning from exercising the dog I found water all over the carpet. Glancing at the tank, I saw that my large 5 in. goldfish was missing, so I dashed out into the garden and down at the very bottom, some 30 yards from the house, I saw my cat tossing the fish in the air. I grabbed the fish, rushed indoors and literally threw it into the tank. It seemed none the worse for its adventure and is alive to this day!

The tank the fish were in at that time was an all-glass one 19 in. by 12 in. and 15 in. deep, filled to about 11 in. It was standing on the window seat so the cat must have stood on his hind legs and fished it out with his paw, as he could not have got his mouth to the water without falling in head first. He then carried the fish upstairs, out at the top of the bedroom window, down over the kitchen roof into the garden. Quite recently he tried to get a fish out of the garden pool and fell in, which cured him of fishing!

On the question of why people start keeping fishes, it is hard to say. I first had one in a round bowl given to me many, many years ago, which I kept many years with not much interest and in the end passed it on to a friend—I think I really took up the hobby because a friend gave me the aforementioned glass tank and I bought some fish to put in it, found them fascinating and went on from there. Now I would not be without them.

I often read questions about snails in tanks and remarks for and against. My fish always eat them; they are all gone in a day or two. I did have two large red ones in my coldwater tank for a year or so and even bred some in a jam jar. However, one died and then the other, and I have never been able to get any more. All other kinds the fish pull out of their shells.

(Mrs.) D. A. HAYES,
Plymouth, Devon.

WORM CUTTER

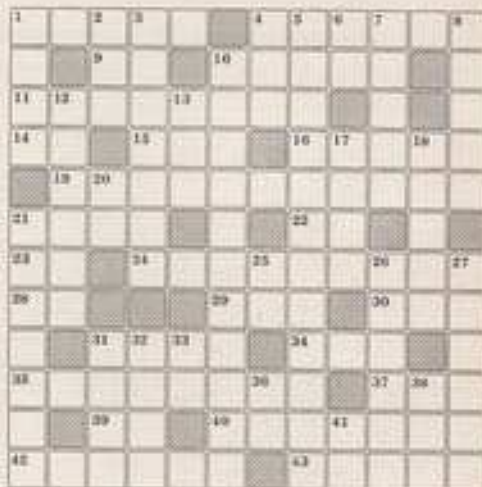


A TOOL I have found very effective for cutting up worms of all sizes, is quite simple to make. All that is required is a piece of wood 4½ inches long by 1 inch thick and three discarded slotted razor blades. Six fine saw cuts are made in the wood and the razor blades are broken into halves and each half is inserted, broken edge first, into a saw cut. This makes a very good cutting instrument.

T. Pearson

The AQUARIST Crossword

Compiled by J. LAUGHLAND



CLUES ACROSS

- Striped favourite (5)
- Tail of *Xiphophorus* (6)
- Ten, figuratively speaking (1, 1)
- Our old friend, guppy (with 19) (8)
- of the Chaldæan (2)
- Scum slice of fish skin (3)
- Heat is hanging round me for a bit (7)
- See 10 Across (1)
- Female, but not sea, horse (4)
- Royal cypher (1, 1)
- The fish is this when looked (2)
- Cross sole (anagram), letting go (9)
- Little subsilver (2)
- Contains most of the boat (2)
- You could have a yen for this Withham (3)
- Natural protection for wood (4)
- Half a herring for her (3)
- Fetch (8)
- A thousand taken from the most are but a grain (3)
- Power (2)
- Cut off the caudal fin, perhaps (7)
- Skates may do this (8)
- Move as a crab moves (5)

CLUES DOWN

- African race of outstanding physical quality (4)
- Fish also known as goat (3)
- Swagger to rhyme with oyster (7)
- Female of fishes (3)
- Three rash cells for chlamydia skin (4, 8)
- Alternative (2)
- Upper the mare to a T for quality (5)
- Visible features of some guppies (5)
- Jacksnipe (11)
- Wild, wandering (8)
- Scum slice of fish skin (3)
- These are used for aquatic propulsion (4)
- Scandal, in short (5)
- Vertical dinner (2)
- Midnight fishes (7)
- Large section of the African continent (1, 1)
- Electrochlanis (6)
- What remains when 31 Across drops off (4)
- Coasting (4)
- Qualified seaman (1, 1)
- "Is —, Brown?" (2)
- Stickers when the snail fish loses its head (3)
- Small Pacific oar of fly family (2)

(Solution on page 261)



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.

THE election of officers at the **Bedford and District A.S.** annual general meeting resulted as follows: Chairman, Mr. W. E. Dourly; vice-chairman, Mr. E. Simpson; hon. secretary, Mr. J. J. Burke, 16c, Lark Road, Bedford; hon. treasurer, Mr. G. Booth; show secretary, Mr. D. Wain, 42, The Ridgeway, Peterborough; members of the committee, Messrs. Merrill, Wilson, Lawrence, Goltman, Davis, Tyson, Mrs. Booth and Mrs. Tyson.

During 1960 the Society was successful in winning the R.M.A.S. shield for the six best highest pointed tropical fish 1960; Mrs. J. Bell, Gorseon Cup for the highest pointed coldwater fish 1960, Mr. L. T. Wilham; Cayton Trophy for best over brood of fish 1960, Mr. R. Thompson. Highest number of points gained during table shows—senior section, Mrs. J. Bell; novice section, Mr. R. Thompson.

Other results: A.V. Tropical, Mrs. J. Bell; A.V. Tropical Catfish and Loaches, Mr. R. Thompson; British Freshwater Fish, Mr. A. Lawrence; A.V. Barb, Mr. L. Burton; Goldfish, Mr. R. Thompson; A.V. Goldfish, Mr. and Mrs. J. R. Parley-Martin; A.V. Characin, Mrs. J. Bell; Shadblow and Fancy Goldfish, Mr. L. T. Wilham; A.V. Livebearer, Mrs. R. Tyson; Common Goldfish, Mr. R. R. Pope; A.V. Livebearer, Mrs. J. Bell.

The Society held its first annual dinner presentation recently, when the plaques and trophies won during the year were presented by the president, Mr. G. S. Soars, F.R.C.S. A varied programme has been arranged for this year, which includes an open show to be held in conjunction with the Radcliffe Agricultural Show, on the 14th and 15th July. Further information regarding the open show can be obtained from the show secretary or secretary. The society meets on the second Wednesday of each month at the Trout Club Hall, Alexandra Road, Bedford. All visitors are welcome.

THE **Basingstoke A.S.** held its annual general meeting in January, and the following officers were elected: President, Mr. S. Franko; chairman, Mr. E. Lavy; vice-chairman, Mr. V. Vowsey; secretary, Mr. T. Eney; treasurer, Mr. D. Joss; show secretary, Mr. J. Goddard; committee, Messrs. H. Saunders, R. Haldenre and A. Weller.

This evening was also chosen as the annual champions class and was won by Mr. R. Porter-Jones. The These Counties Aquarists Show will be held in Basingstoke on the 16th and 19th August, and the show secretary for this event will be Mr. R. Porter-Jones, 5, Park Lane, Old Basing, Basingstoke, Hants.

BLACKPOOL'S winter show, Alderman Clifford Cross, was again elected president of the **Blackpool and Fylde A.S.** at the annual general meeting held in January. Other officers elected were: Vice-president, Mr. V. Parthen and Mr. G. N. Hadley; chairman, Mr. R. Dose; vice-chairman, Mr. A. G. Gower; hon. secretary, Mr. B. Crowther, 15, St. Hilary Road, Blackpool, (Tel. 46354); hon. assistant secretary, Mrs. G. E. Crowther; hon. treasurer,

Mr. D. H. Hammett; hon. technical adviser, Mr. G. Beaumont (head of Blackpool Towing Apparatus); hon. equipment officer, Mr. G. N. Hadley; hon. publicity officer, Mr. R. N. Twombles; hon. table show secretary, Mr. R. N. Twombles; F.N.S.S. delegate—Mr. R. W. Cook and Mr. A. G. Gower; hon. librarian, Mrs. O. Taylor. A comprehensive programme of talks, films, table shows and social activities is being arranged for the year and a cordial invitation is extended to all aquarists visiting the town. Meetings are held on the second and fourth Wednesdays of each month at Victoria Arms, near bus station and North Station, commencing at 8 p.m.

THE main item for the February meeting of the **Northampton and District A.S.** was a film show dealing with sea fish and shore life. The society gratefully accepted the resignation of Mr. J. Carrall as secretary, and he was thanked by the chairman for his good work over the past year. Mrs. Upton was appointed temporary secretary in his place. The results of the meeting's table show for catfish and loaches were: 1 and 2, Mr. R. Mermey; 3, Mrs. Upton.

OFFICIALS elected at the annual general meeting of the **Sheffield and District A.S.** were as follows: President, W. Taffie; vice-presidents, J. Beaumont and R. Colborn; treasurer, H. Green; hon. secretary, Mrs. M. Knowles; assistant secretary, D. Craven; committee, A. Forring and E. Townsend; show secretary, W. Wether; librarian, Mrs. L. Frost. The annual dinner celebrated the society's 25th birthday, and the retiring president presented the most awards as follows: Fish of the year (Group 1) Beaumont; Dugster Cup, Mrs. P. Brooker; Furnished Aquarium, A. Forring; Breeder's Cup, H. Hastings; Year's Total Table Show Plaques—1, J. Beaumont; 2, S. A. Ayle; 3, W. Wicks.

Recent table show winners are: Any Other Species (Tropical)—1, 2 and 3, J. Beaumont; Gosper Table Show—1, A. Wragg; 2, D. Craven; 3, W. Wicks. A Wragg, a junior member, held four of the first seven positions in this show. A lively evening was spent under the heading "Your questions answered." Members tried to excite the panel in questions on the hobby. A viewing of a set of slides loaned by the Hendon Society—"Every Man an Expert," was well received, and enjoyed by all who attended this meeting.

MEMBERS of the **Cambridge and District A.S.** held their annual meeting with their president, Mr. Simpson, in the chair. The bank balance had dropped over the past year, but it was a hopeful sign that the membership was on the increase.

The officials re-elected for the year are as follows: Chairman, Mr. Amps; vice-chairman, Mr. Berley; secretary, Mr. Ingrave; 14, Charles Street, Cambridge; treasurer, Mr. Radford. At the close the president awarded the Founder's Trophy to Mr. Aldridge, and it was hoped to see a good attendance on 7th March for the visit of Mr. Olsen.

AT the **Perthmouth A.S.** annual general meeting Mr. Wainor was re-elected as president and Mr. Brillwell volunteered to remain as chairman, as also did the secretary, Mr. D.

Mills was elected as treasurer and a vote of thanks was given to the retiring treasurer, Mr. R. Nunn, after seven years' faithful service.

The 9th open show will be held at the Community Centre, Twyford Avenue, Southampton, from the 9th August until the 12th August. The setting-up date will be on Sunday the 6th August, and the judging will be done on August Monday, the 7th August.

The show secretary is Mr. W. Ryder, 99A Commercial Road, Portsmouth, Hants, and show schedules will be ready at the beginning of July.

THE officers appointed by the **Kingston and District A.S.** for 1961 were as follows: Chairman, Mr. H. F. Woods; secretary, Mr. M. J. Lambert; treasurer, Mr. A. L. Barber; show secretary, Mr. H. Towell. The latter club table show will be held on Saturday, 23rd September at St. Luke's Social Centre, Elm Road, Kingston-on-Thames, and all interested clubs are invited to attend and enter fish. Schedules may be obtained from show secretary, Mr. H. Towell, 11, Belmore Terrace, London W.4. Mr. George Cammille has agreed to visit the club later in the year, provided that his overseas commitments permit, and a visit to Mr. William G. Kingham has been arranged for 6th July, when members will be shown over his collection of British animals and birds at Effingham Common, Surrey. On 1st December the lady members will provide their annual dinner and entertainment.

A programme of club table shows has been arranged for the second meeting of each month commencing in March. It is hoped that it will be possible to arrange other clubs on some of these evenings. Meetings are held on first and third Thursdays each month at the St. Luke's Social Centre, Elm Road, Kingston-on-Thames, Surrey, and particulars may be obtained from the secretary, Mr. H. J. Lambert, 82, Knollwood, Tolworth, Surbiton, Surrey.

THE majority of the members of the **Rugby and District A.S.** were present at the annual general meeting held recently when the vice-chairman had the pleasure of presenting the Herbert Cup to Mrs. Williamson for the best showing in the 1960 Tropical table shows. In this timely seasonal section Mr. Bennett carried off the runner-up place. In the Coldwater section Mr. Barton easily won the Bedford Cup.

New officers elected for the year included: chairman, Mr. W. Smith; hon. secretary, Miss R. Smith; treasurer, Mr. L. Barton. All those interested in the hobby and residing in Rugby or district, should write to Miss R. Smith, hon. secretary at 15, Oxford Street, Rugby, for further details of the society's activities or are cordially invited to attend the meetings held at the Pyralid Guildhouse, Rugby at 8 p.m. first and third Mondays of each month.

THE home furnished aquaria competition of the **Southampton and District A.S.** was split into two classes for the first time. In all, 23 entries were received and the competitors were so keen this year that the top five places were hardly separable. The winners were as follows: Senior Home Furnished: 1, C. R. Yerman (83 pts.); 2, D. E. King (82 pts.); 3, K. Poole (81 pts.); 4, A. Long (81 pts.); Novice Home Furnished: 1, E. A. Twelvtree (81 pts.); 2, L. Allen (70 pts.); 3, D. E. Yerman (69 pts.); 4, B. Sims (67 pts.).

The annual show is being held at the Avenue Hall, Southampton, from 22nd to 24th June, and all enquiries should be sent to Mr. D. E. King, 32, Clover Nook, Radbridge, Southampton.

The society is going to attempt to take colour slides with the ultimate aim of adding tape for use by other societies. Any interesting information relating to this type of photography would be gratefully received and should be sent to the above address.

A DISCUSSION on "Filtration and Aeration" took place at the last meeting of the **Southend, Leigh and District A.S.** During the evening the residents presented to Messrs. L. and M. Willis, the Julia Giles Trophy for meritorious

breeding of *Balaus gooi*. Recently the club produced its first monthly bulletin.

A VERY interesting evening was had by all members of the **Thames A.S.** at the January meeting, when neighbours **Gosle A.S.** paid a visit. Some very fine fish were seen in the table show between the two societies in which Thames won by 60 pts. to 30 pts. A return visit to Gosle is to be arranged at a later date.

The results of the Thames Society table show for Balaus was as follows: 1. Mr. D. White (sagitt barb); 2. Mr. N. Sanders (foto barb); 3. Mr. D. Mearns and Son (foto barb).

THE Accrington and District A.S. will hold their eleventh annual show in the Town Hall, Accrington on Saturday and Sunday, 2nd and 3rd September. Schedules will be sent to all societies within a reasonable distance of Accrington.

THE past year was described as being the best in the club's post-war history at the annual general meeting of the **Brighton Amateur A.S.** It was decided to change the name to the **Brighton and Southern A.S.** and the following officers were elected for the coming year: Chairman, Mr. B. Mollison; secretary, Miss B. Stephenson; treasurer, Miss P. Carr; committee—Messrs. C. Dowling, P. Fitzgerald, S. Archer and G. Field; show secretary, Mr. B. Stehman; equipment officer, Mr. C. Dowling; librarian, Mr. B. Bassett; auditors—Messrs. B. Lee and G. Field. Several items of special interest are included in the current programmes, full details of which can be obtained from the secretary, Miss B. Stephenson, 14, Lincoln Street, Brighton 1.

AT the last meeting of the **Bristol Tropical Fish Club**, a talk on "Poison Fish" was given by the club treasurer, Mr. E. Jones, who gave details by means of illustrations, of the insects etc., to be wary of when obtaining live foods from ponds, and those which could be safely used in the aquarium.

It has been decided that the Club stage an open show and exhibition (Tropical only) to be held at the Temple Gables School, Victoria Street, Bristol on 1st and 2nd September. Schedules and other details will be circulated in due course. Mr. F. D. Brown, 76, Pearl Street, Bristol, 1, will be acting as show secretary.

MEMBERS of Coely and District A.S. saw a new fish "Pipidon from Wundrich" at their last meeting. Afterwards members took part in a light-hearted quiz. Mr. Eric Green received his award as winner of the society's home aquaria competition.

THE Tottenham and District A.S. have moved their premises and now meet at the Tottenham Liberal and Radical Club in Tottenham High Road on the second and fourth Thursdays in the month, at 8 p.m. Visiting will be made very welcome, and any enquiries should be sent to the secretary, Miss P. Hawes, 29, St. Georges Road, Edmonton, N.9.

THE membership of the Bradford and District A.S. remained constant during the year, and the high standard of achievement was also maintained. The election of officers resulted as follows: President, Mr. A. E. Thornley; vice-president, Mr. E. Lewis; secretary, Mr. E. Marshall, Greencliffe, 13, Park Hill Drive, Bradford; treasurer, Mr. E. Barrer; social and publicity officers, Mr. R. Watkinson. The open table show is to be held on Sunday, 28th May, in the Assembly Hall, Co-operative Institute, Thornton Road, Bradford, and schedules are now available.

THE North Warwickshire A.S. has had an extremely successful first year. Under the leadership of president, Mr. Geo. Griffiths, the society has taken over 20 awards in open shows including the "Outstanding Effort" award at Manchester, five gold-were awarded at Birmingham, and a third award in the tropical furnished—also at Birmingham. At the annual general meeting the following officers were elected: Chairman, S. Swadlow; vice-chairman, J. Bottrell; secretary, L. W. Malt, 680,

Kingstanding Road, Kingstanding, Birmingham, 22X; treasurer, Mrs. M. Dixon. The society meets at the Pavilion, Cooksey Lane, Kingstanding, Birmingham, on the last Wednesday of each month.

AT the annual general meeting of the **Dewsbury and District A.S.** it was reported that greater enthusiasm and increased membership were the two features of a busy year. The election of officers resulted as follows: President, Mr. D. M. Crowther; vice-president, Mr. J. Thompson; secretary, Mr. E. G. Peace; treasurer, Mr. A. Tomlinson; show manager, Mr. L. Thornton; social secretary, Mr. A. Ruse; publicity manager, Mr. A. A. Brown; auditors, Mr. C. Hattersley and Mr. L. Thornton; delegates to F.N.A.S.—Mr. G. W. Cooke and Mr. E. G. Peace; delegates to A.Y.A.S.—Mr. D. M. Crowther and Mr. A. A. Brown.

Recently the society held its annual dinner when the trophies were presented for table shows held in 1960. Society meetings are held on the second Thursday and last Wednesday of the month in the Turley Club, Union Street, Dewsbury, and new members are very welcome.

STEADY progress is reported from the **Ottar Aquarist and Pondkeepers Society (Swindon)**. At the annual general meeting the following officers were elected: President, Mr. M. Lawson; chairman and temporary treasurer, Mr. J. Hayward; secretary, Mr. J. Williams, 27, Argyle Street, Gosport Hill, Swindon. The programme for this year will feature film and slide shows and lectures. The secretary would like to contact any club with files 16 mm. or slides for loan or hire.

THE officials elected by Taunton and District A.S. for the year were as follows: Chairman, Mr. J. Sams; vice-chairman, Mr. B. Collins; secretary, Mr. L. E. Eggleston, 129, Galmington Road, Taunton; treasurer, Mr. C. Scott; show secretary, Mrs. H. Cox; librarian, Mr. P. Gibson. Meetings are held on the third Tuesday of the month at the Adult School, Harcourt Street, Taunton, at 7.30 p.m.

ONE of the chief items at the last meeting of **Reading A.S.** was an auction which provided plenty of entertainment. Mr. R. Forest-Jones gave a talk on the basic principles of a Guppy Group, and also discussed the various types, standard and colour. Mr. Forest-Jones also judged the table show for the "Best Fish of the Year," and this was won by Mr. E. Anderson (silurid cory fish); the second being Mr. E. Pitts (bleeding heart tetra); Mr. D. Anderson (black mollie) was third.

A TABLE show for the Scott Trophy was included in the last meeting of the **Dundee A.S.** The first and second places were occupied by Mr. A. Robertson with Mr. W. Cookson third, and Mr. R. Russell fourth. The placings to date for this trophy are: 1. Mr. A. Robertson (16 pts.); 2. Mr. W. Russell (7 pts.); 3. Mr. G. B. Kirkland (3 pts.).

A SUCCESSFUL year, in which the Regent A.S. of Derby made its appearance at the leading shows in the country, was reviewed at the society's annual general meeting in February. A very useful balance in hand was reported by the treasurer (Mr. Jack Derbyshire) and the newly-elected chairman (Mr. Peter Hasko) predicted a busy year of showing, both locally and nationally. A programme of inter-club shows within a convenient radius of Derby is to be discussed by the committee. Officers elected: President, Mrs. A. Varner; chairman, Mr. P. Hasko; treasurer, Mr. J. Derbyshire; secretary, Mr. John Burwell, 218, Harrington Street, Four Tree, Derby; committee—Messrs. E. Dorrain, M. Ash, R. Lamb, H. P. Finch, J. Parker, G. W. Ryalls and M. Cuthbert.

SECRETARY CHANGES CHANGES of secretaries and addresses have been reported from the following societies: Leeds and District A.S.—G. W. Leonard, 26, Harrop Avenue, Matley, Leeds; Taunton and District A.S.—L. E. Eggleston, 129, Galmington Road, Taunton.

AQUARIST'S CALENDAR 6th-8th April: **Middleborough and District A.S.** annual open show at All Saints Hall, Middleborough. Entry forms are available from the show secretary, Mr. R. Whittam, 14, Deventer Road, Middleborough.

6th-6th May: **Slough Aquarium Society** general open show at the Slough Community Centre. Show secretary: Mr. E. C. R. Knight, Jamaica House, Hatch Bridge, Windsor, Berks.

28th May: **Bradford and District A.S.** open table show at the Assembly Hall, Co-operative Institute, Thornton Road, Bradford. Schedules are available from Mr. R. Marshall, 13, Park Hill Drive, Bradford 9.



BRITISH AQUARISTS' FESTIVAL 1961

10th and 11th June

BELLE VUE ZOOLOGICAL GARDENS, MANCHESTER

Schedules which will cover all varieties of Tropical and Coldwater Fish are now obtainable from—

Man. Show Secretary:

GEO. W. COOKE,

"Spring Grove", Fieldhill, Batley, Yorks.

Crossword Solution

Z	E	B	R	A	S	W	O	R	D	S
U	I	O	S	H	A	R	E	P		
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GRO-WEL

SUPERIOR

FILTERS

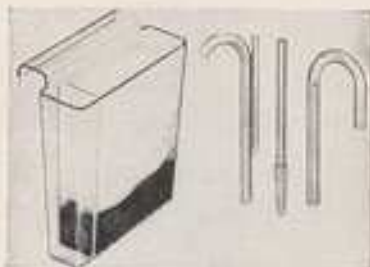
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BERKSHIRE

The Reading Aquarist
64, King's Road, Reading
Telephone: Reading 53632
E.C.D. Wednesday R. C.T.P.A.A.

BUCKINGHAMSHIRE

Brown, K. G.
100, Amersham Road,
High Wycombe
Tel. 1573 R. C.T.P.A.A.

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Grassby, Joe., F.R.H.S.
"The Glen" Fisheries, Moberley, Nr. Knutsford
Tel.: Moberley 3272 W. C.T.P.A.A.R. & A.
Robert Jackson (Naturalists) Ltd.
Holly Bank Nurseries, Grove Lane, Hale
Telephone: Ringway 3301
WR. C.T.P.A.A.R. & A.

DURHAM

Metcalf, G. R.
2, High Northgate (near A.B.C. Cinema)
(On main A.1 road) Darlington
Telephone: Darlington 5991
E.C.D. Wednesday, R. C.T.P.A.A.R. & A.

ESSEX

Goodmayes Aquaria
Shaftesbury Parade, High Road, Chadwell Heath
Telephone: Goodmayes 2594
E.C.D. Thursday, R. C.T.P.A.A.

The Hamlet Aquaria
14, St. Helen's Road (off Hamlet Court Road),
Westcliff-on-Sea
Telephone: Southend 44724
E.C.D. Wednesday, WR. C.T.P.A.A.

HAMPSHIRE

Arundel Aviaries & Fisheries
211/215, Arundel Street, Portsmouth
E.C.D. Wednesday, WR. C.T.P.A.A.R. & A.
Wingate Zoological Supplies
7, Market Street, Winchester
Telephone: Winchester 2406
E.C.D. Thursday, R. C.T.P.A.A.R. & A.

HERTFORDSHIRE

Cura, L. & Sons
Water End, Hemel Hempstead
Telephone: Water End 44
E.C.D. Saturday, W. C.P.R. & A.
Wat-Pet Stores
66-68, London Road, St. Albans
Telephone: St. Albans 55439-55507
E.C.D. Thursday, WR. C.T.P.A.A.

KENT

Kingfisheries Aquarium
138, Croydon Road, Beckenham
Telephone: Beckenham 3716
E.C.D. Wednesday (all day), W.(P), R. C.T.P.A.A.
Sherwood Pet Stores
(Proprietors, Fairbairns Aquaria, Ltd.),
252, Sherwood Park Avenue, Sidcup
Telephone: Bexley Heath 7217
E.C.D. Thursday, R. C.T.P.A.A.R. & A.

LANGASHIRE

Hornby's
Trafford Bar, Old Trafford,
Manchester, 16
Telephone: Trafford Park 2989
E.C.D. Wednesday, R. C.T.P.A.A.R. & A.
Liverpool Aquaria Company
23, Sir Thomas Street, Whitechapel, Liverpool, 1
Telephone: Central 4891
E.C.D. Wednesday, R. C.T.P.A.A.R. & A.
"Stanleys"
110-112, Shakespeare Street, Southport
Telephone: Southport 5369
E.C.D. Tuesday, R. C.T.P.A.A.

LONDON (North)

Phillip Castang Ltd.
91, Haverstock Hill,
Hampstead, N.W.3
Telephone: Primrose 1842 and 9452
E.C.D. Saturday, W. T.P.A.A.R. & A.
Paramount Aquarium
95, Haverstock Hill,
Hampstead, N.W.3
Telephone: Primrose 1842 and 9452
E.C.D. Thursday, R. C.T.P.A.A.R. & A.

LONDON (South)

Fairbairns Aquaria, Ltd.
15, Well Hall Parade, Eitham, S.E.9
Telephone: Eitham 5859
E.C.D. Thursday, WR. C.T.P.A.A.R. & A.
The Jaynor Organisation
(James North (London) Ltd.)
316, Lee High Road, Lewisham, S.E.13
Telephone: Lee Green 3577
E.C.D. Thursday, WR. C.T.P.A.A.
South Western Aquarists
2, Glenburnie Road, Trinity Road,
Upper Tooting, S.W.17
Telephone: Balham 7334
E.C.D. Wednesday, WR. C.T.P.A.A.R. & A.
Tachbrook Tropicals
244, Vauxhall Bridge Road, Victoria, S.W.1
Telephone: Victoria 3179
(Open all week except Sundays).
WR. C.T.P.A.A.R. & A.

LONDON (West)

Owen Reid's, Aquarium Dept.
12, Spring Bridge Road, Ealing Broadway, W.5
Telephone: Ealing 3259
E.C.D. Wednesday, WR. C.T.P.A.A.R. & A.

NORTHAMPTONSHIRE

The Aquarium
192, Wellingborough Road,
Northampton
Telephone: Northampton 34610
E.C.D. Thursday, R. C.T.P.A.A.R. & A.
The Pet Shop
120, Kettering Road,
Northampton
Telephone: Northampton 841
E.C.D. Thursday, R.C.T.P.A.A.

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Headington, Oxford

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E.C.D. Thursday R. C.T.P.A.A. R. & A.

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147, Horsley Fields, Wolverhampton

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E.C.D. Thursday R. C.T.P.A.A. R. & A.

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Fanday Aquaria

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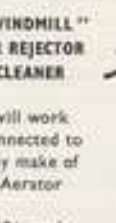
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