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Editorial

It is no new departure for The Aquarist to raise its voice in defence of the tortoise. From our early days we have agitated for better treatment for these reptiles, with some success in obtaining improvement in transportation to this country, but the fact remains that the tortoise is still the most exploited “pet animal” we have.

Twice already this year have reports been made of finding large numbers of tortoises, dead and dying, jettisoned by persons unknown who had evidently become embarrassed by their unprofitable burden. One batch of these subtropical animals turned up on a London bombed site on a bitterly cold winter’s day. Many were dead, many more had to be destroyed. Last month 1,500 dead tortoises were found in baskets on the foreshore at Barking. It can be imagined that for every such incident where the numbers of animals involved are of such magnitude to warrant mention in the National press, quite a few others occur that do not receive such publicity.

Just how many tortoises have been imported in the past two years is a figure that cannot be ascertained. Only recently one consignment of 100,000 was advertised. One fact we can be sure—only a minute fraction of the total number ever survives the first winter in this country. Rarely are these long-suffering creatures in good condition when they arrive, and although they are not difficult to keep, their needs and requirements are quite different from those of the usual run of pets and beyond the experience and interests of their average casual purchaser.

What can be the state of their numbers in the countries from which they originate? Is the natural rate of tortoise breeding adequate to meet the inroads made through the years by native collectors eager to supply these doomed cargoes at small cost to themselves? We doubt it. It seems likely that we are witnessing yet another ruthless and senseless extermination of a harmless and interesting form of animal life which because it is without voice, lacks fur or feathers and is quite defenceless, can be traded without fear of interference from authorities usually so active where cruelty to more conventional pets is suspected. Cannot this traffic be stopped before it is too late?
Can Tobacco Smoke Kill Fish?

Experiments with guppies provide fresh facts

It has several times been said that fishes do not live for long in aquariums situated in club and smoking-rooms, places where the atmosphere becomes charged with tobacco smoke for long periods at a time. How much truth is there in this?

Tobacco smoke contains resins, nitrogen, carbon dioxide, carbon monoxide and hydrogen sulphide gases, prussic acid, ammonia and nicotine. All the harmful substances are present in insignificant amounts, nicotine being the only compound that could be regarded as capable of exerting much effect. Direct experiment by Schuster-Woldan showed that 10 milligrams of nicotine to every litre of aquarium water killed guppies in five minutes; four day old fishes were killed in two minutes. Three to five milligrams to the litre proved fatal within twenty to sixty minutes.

Male guppies were more susceptible to nicotine than females but pregnant females tended to abort their young. Of 80 Labistes exposed to weak nicotine solutions 11 hours a day for 25 days only 32 were alive after 50 days; the normal life is three or four years under best conditions. Normal females produce about 80 to 150 youngsters a year but those exposed to one and a half milligrams of nicotine in a litre of water produced only 15 young in a year, and many youngsters were still-born or deformed. Higher concentrations of nicotine killed the females or made them sterile.

More recently, experiments have been made by Dr. H. Mann of Hamburg Institute of Fisheries, who used tobacco smoke instead of pure nicotine solutions. In each cigarette there is known to be between two and six milligrams of nicotine; cigars contain about 17 milligrams each. Cigarette smoke was blown through glass tubing into the aquarium water. At first the guppies swam nervously around, and then after about 10 minutes their pectoral fins were partly paralysed so that balance was impaired.

A period of stimulation was seen to follow, in which irregular movements occurred, but these decreased gradually and death occurred after 30 to 45 minutes. During this period smoke from two or three cigarettes had been blown in. Nicotine is rapidly changed to harmless substances in dilute water solution and water through which cigarette smoke had been blown was not harmful after keeping it for six days. It is purified more quickly by blowing air through it. Fishes transferred to fresh water from smoke solutions at an early stage recovered completely.

To determine the effect of smoke on an open aquarium in a living room, Dr. Mann made experiments with mineral water bottles. These were half filled with water and fishes were introduced. Cigarette smoke was then blown into the bottles (not through the water), the stoppers being in position between "puffs." After 70 minutes smoke from three cigarettes had been added. Analysis of the water showed a fall in oxygen content and rise in carbon dioxide and small amounts of phenols and ammonia were detected; the nicotine was at a concentration of over six milligrams a litre, and at this level was rapidly fatal to fishes.

Although it can be imagined that fishes in a can on top of a rush hour "bus or in a crowded train compartment would not live long exposed to the "fug," rarely are living rooms filled with smoke to the same extent. Fishes in uncovered tanks in smoky rooms may easily be affected though not killed, and sometimes "off-colour" phases may be ascribed to this cause.
Care and Breeding of *Copeina*

by MARGERY G. ELWIN and L. C. MANDEVILLE

The species of the genera *Copeina* and *Pyrrhulina*, which live in the Amazon, are very much the characins of Europe. They are different in body form, temperament and mode of breeding, from those characins that are kept in aquaria. The body is compressed so as to be rather herring-like than most other characins. The fins are relatively unimportant; the adipose fin, situated at the base of the dorsal and the caudal fin, which is so characteristic of this family, is absent in these two genera. Most characins are not wading fish but these remainder one more of their species in the way they lie up among the floating leaves, moving about in a very lazy manner. Unlike the others, they are not waiting for some poor mislaid or other small fish to wander their way and become a desirable snack.

*Pyrrhulina* species are not cannibalistic, and *Copeina* is a peaceful species. Usually, they do not molest in any way, which most fish would not hesitate to employ. The breeding habits are most interesting and again in the case of *Copeina arnoldi* they are unique. These fish are so rare in England that the phenomena will be referred to briefly. The pair swim very close to each other and, when together, leap out of the water. The process is repeated a number of times, each time the eggs are laid in small batches. After spawning, the males swim around immediately above the eggs and regularly splash them with water by contraction of their fins. The eggs eventually burst and the fry wriggle out and drop into the water.

**Air Force Blue**

*Guttaea guttata* is not nearly so strange in its breeding habits as *Copeina arnoldi*. It is usually easier to keep at a relatively low price and is easier to care for and to induce to spawn. It is this that will be described in more detail. The general characters having been given above, the individuals follow.

The ground colour is rather difficult to describe exactly. In certain lights it appears to shade from a deep plum colour on the back to a whitish blue on the underside. In other lights it is said to be a golden orange. Under normal conditions, the best way to describe the colour is as a varying depth of "Air Force Blue" falling to white on the underside. The sides of the fish are marked by longitudinal series of crimson dors, outstanding brightly and conspicuously. This marking is specific to *Guttaea guttata*, which means rainforests. The intensity of the colouring depends very much on the temperature and condition of the specimen. The fins are usually absent in the female though sometimes spots may be present. This characteristic pockets are seen fairly easily. The fins are of a distinctive yellow colour.

The dorsal is marked by an obvious black fleck, which is more pronounced in adult males, while in other lights it is said to be more evident in the male. The ventrals, the tips of the tail are a bright orange. This fish is able to be spread of and grown in the wild.

A strange fact about this species is the deviation between the size of adult wild specimens and adult specimens in captivity. Wild fish exceeding three inches have only been taken on very rare occasions, but in the aquarium the usual adult size is a little over four inches—and the authors have twice seen specimens of five inches. This fact is always brought up when this species is discussed, for it is so curious, as with all our other aquarium fish it is fairly safe to say that the reverse is true. No satisfactory explanation has been offered, because all such suggestions would lead one to believe that it would be possible to grow super-sized specimens of other aquarium species, and this we are not able to do.

*C. guttata* is a good community fish even though it tends to become rather large for small tanks. In a community of large fish such as barbs and the large livebearers, *C. guttata* is apt to be left out of things at meal times and will soon begin to look off colour. In spite of its general tendencies it is a heavy feeder and needs particularly large quantities of good meaty food to get into breeding condition. Earthworms, and dried food with a good base of dried shrimp, will be readily eaten, and fish-paste, canned prawn, etc., are eagerly taken as tit-bits. At feeding time this fish readily forsakes the upper part of the aquarium and comes down and grubs about on the bottom for bits and pieces.

**Breeding Recommendations**

It has been said that it is better to condition these fish in a rather small tank so as to restrict their activity to some extent and so hasten the process of "filling up." As they never swim about in a very active manner this precaution seems rather superfluous, but so many queer things have been said about *C. guttata* that it seems worth while repeating some of them, leaving readers to decide for themselves what they will experiment.

The preparation of the breeding tank is quite simple. It should be of an absolute minimum of ten gallons—twice this capacity if possible. The water should be about eight to ten inches deep and the sand about two to two and a half inches, very clean and fairly fine. Rows of grass-like plants, *Sagittaria* and * Vallisneria*, should be set about. The condition of the water is important. It should be quite freshly matured—not old—well aerated and, if possible, an
airline should be laid on. The pH does not seem to be of very great importance provided it is within normal limits, but it is probably best about 6.8 and certainly should not exceed 7.4. A desirable temperature is about seven degrees higher than the conditioning tank, somewhere between 80° and 85° F. The pair are best introduced into the spawning tank after dark. This is, of course, a precaution which is quite worth while when introducing any spawning fish to the prepared tank. Usually, the pair will not spawn the next day, but they do as a rule in the next two or three days.

The first indication of approaching spawning is the action of the male who will be seen fanning a saucer-shaped depression in the sand, three to four inches in diameter. It is the pectoral fins that are used in this process. Sometimes the female will take part in this process, but not always. If the pair is quite settled and happy, the pit will probably be made well out in the centre of the tank, where it can easily be observed, but if they are subjected to a lot of disturbance and interference either the pit will be prepared hidden away behind the plants or else they will refuse to do anything at all. They are in a state of unusual tension at spawning time, as will be evidenced by the sharpness of their movements, and, being by nature a rather gentle, slow and retiring fish, they are easily put off. The pit prepared, with much fin fluttering and coiling, the pair hover side by side over it. The female drops down, followed by the male, and a batch of eggs is deposited. The eggs are not thrown about or laid in a solid mass, but are spread over a large space in a single layer with no spaces between succeeding batches. This has led some observers to report that the eggs are laid with geometrical accuracy, and one rather expects to see the spawn arranged in a delicate pattern, but, naturally, this is not so.

Scheming aquarists who have been unsuccessful in getting their fish to spawn in this way—which we assume is fairly natural, since the fish will repeat it often even when opportunities for performing it otherwise are offered—have invented several tricks to hasten or encourage the act. Instead of allowing the fish to fan a pit, a saucer, scallop shell, or piece of slate is provided for the spawn to be deposited upon. The colour of the saucer is said to be of importance; some say white, some yellow, also some aquarists turn it upside down so that it forms the reverse of a pit. In the opinions of the writers, this latter is most unnatural, and, mostly, such an arrangement is ignored by the fish. At any rate, these ideas are worth trying if success does not come your way at once. The essentials, it will have been gathered are clean, fine sand, fresh water and quiet. These provided, no other artificialities will normally be required.

Liberal Spawning

The eggs when laid are very small and match the sand so well that they are rather difficult to detect. A normal spawning will be about five hundred eggs, though spawnings twice this size are not unusual. You now realise the need for a large tank. The female will have hidden herself in a corner and is best removed, as now she serves no useful purpose; the male, however, has a definite and valuable task to perform. He swims in a wide circle round the pit and quite regularly breaks his beat and hovers over the eggs fluttering his fins, so circulating the water around them and washing off any debris that may have settled thereon. After dark he takes up a position quite close to the eggs and remains there resting until it becomes light again, when he recommences his task. Occasionally reports have been made of C. guttata spawning in community tanks and successfully hatching the fry in spite of the attempts of other fish to get at the eggs.

In about thirty hours the eggs will be seen to be vibrating vigorously, and in forty hours, at 80° F., the young hatch and swim up, attaching themselves to the glass and the plants. Having hatched his family the father tends to lose interest; he won't even eat them! To give the fry a maximum amount of room, however, he is best removed. They are very small, but three days feeding with a heavy culture of Infusoria will put sufficient growth on the fry to enable them to take the flour of fine dried food. Growth is very rapid and usually very irregular, and soon the biggest babies begin to eat their underdeveloped brothers and sisters. If it be desired to raise a maximum number, something in the way of grading the fry will have to be attempted, but to raise thirty or forty will probably satisfy most aquarists, in which case they can be left as they are.

Cannibalistic Youngsters

Give the fry as much good small food as you can so as to keep the largest possible number of them going. Whatever good and tasty the food, it will not cause the bigger ones to cease their cannibalism, and, as it has been very aptly said, "there is no food for C. guttata fry."

In about five weeks the orgy of eating and being eaten will have worked itself out, and the result is usually about forty young fish ranging in size from half an inch to an inch. The feeding henceforth is quite straightforward and presents no difficulty.

The young are fairly well coloured at two inches, but it is only in the adult fully-grown fish, particularly the males, that the colour attains its maximum beautiful intensity. When fully grown they really are show pieces, but the fact that large specimens are seldom seen and command high prices, while the youngsters are not so brilliant as other small characins at the same price, probably accounts for their lack of popularity.

How and Why?

My thermostat causes interference with my television set and radio. Can I overcome this?

All that is needed to stop the noise or visual interference with other electrical equipment that is caused by some thermostats as they cut in and cut out is a small condenser. Obtainable from any wireless shop. Ask for 0.1 microfarad tubular condenser. Bare and separate the two wires running into the thermostat for a short distance close to the instrument and solder each wire of the condenser to one of them. Cover the bare wires efficiently with insulating tape. Air pumps giving interference can be treated in the same way.

What precautions can be taken when using electricity near water, as in heating a tropical aquarium?

Modern aquarium equipment is quite safe and accidents are rare. Shocks may be obtained from tank frames and even from the water if thermostats or switches to heaters have been wrongly wired. They must be placed on the live (usually red-covered) wire and not on the neutral return lead. Check which lead from a point is which with a neon tester—it lights only when one wire from it contacts the live wire. For safety earth the aquarium by running earthing wire from a clip secured to the metal frame and in contact with the water to the earth pin of your three-point plug.

J. Francis

THE AQUARIAN
Questions and Answers on Breeding

by A. BOARDER

COLDWATER fish-keeping appears to be increasing greatly in popularity once more, and aquarists are tending to look for fishes other than goldfishes with which to work. The first question this month is typical of many I receive:

For the past few seasons I have successfully bred several varieties of goldfishes in my 12 ft. by 6 ft. pond (over 2 ft. deep), and I would like to make a change. Can you recommend any other fishes for breeding in the pond?

There certainly are other fishes for you to try your hand at breeding. Why not have a go with green tench? These are good fish for the pond as they will not interfere with the goldfishes. I have one pair, or one female to two males, which is what I use.

The male usually shows a difference from the female in that the pelvic fins are inclined to be spoon-shaped. Green tench are one of the latest British fresh water fishes to spawn and often will not make any attempt until July.

Feed the tench well on earthworms and water snails—they are very fond of these but you will have to crush them first. You can use bunches of water plants as recommended for goldfishes and anchor them at the shallow part of the pond. I find that the tench always prefer shallow water in which to spawn, as do goldfishes. Spawning is most likely to take place in warm weather, and it will probably continue all day long. I have had my tench spawning as late as 9.30 p.m. It is very unusual for goldfish to spawn as late in the day. The eggs are very similar to those of the goldfish and can easily be mistaken for them; they are adhesive, and so stick to the water plants.

It is advisable to remove the eggs to a separate container for hatching as otherwise very few fry will be reared, for they are so very small and inactive when very young that many would be eaten if eggs were left in the pond to hatch. Treatment is from then on the same as that which I recommend for rearing goldfish. As the young grow they do not require live food such as Daphnia, but they can be successfully reared with crushed small earthworms. I have sometimes reared tench entirely on dried foods but their growth was not as rapid as when live foods were used. As a matter of interest—my own reared green tench bred themselves when they were only two years old.

You could also try your hand at breeding golden orfe, but I am afraid that your pond is hardly large enough for this purpose. Orfe like plenty of room and also well-oxygenated water. I have known them to breed in a medium sized pond, but it was at least twice the size of yours. However, nothing ventured nothing gained! It is quite impossible to be able to say definitely what any particular fish may or may not do; only by experimenting can we determine their requirements.

The water level of my breeding pond has been steadily falling since winter and I would like to have advice about stopping the leak.

Such leaks can be troublesome and the repairs which one can do will often last only until some severe freezing weather causes expansion of the surrounding concrete. There are several methods of dealing with the leaks: if the crack is only a small one it can often be stopped by forcing into it some material such as "Sclastic" which is a putty-like substance and being waterproof will often enable the crack to be sealed quite safely. Obviously this would not do for large cracks and repair of these will, I am afraid, necessitate the emptying of the pond. Clean the pond out well and scrub the concrete.

Let the pond dry, and as it dries the cracks will show up more clearly for they remain wet longer than the sound surface. With cracks which are no more than a quarter of an inch across you can try the following method. Cracks that have not dried out must be gone over with a blowlamp. If the pond is well below the surrounding earth then you may find that water will seep back into the pond through the cracks, but they must be dry for this method. Get some bituminous material (there are several brands on the market) and force this into the cracks with a trowel, making sure that plenty of force is used; it is no use leaving just a thin coating over the crack. The fact that this material is waterproof should indicate to you that it will not stick onto a wet surface. Allow the stuff to dry after application and then you can refill the pond. The bituminous substance will not harm the fish when they are returned and as the material in the cracks may not dry for a considerable period it will give a little if the concrete expands or contracts with the weather.

If the cracks are large then a more drastic method will have to be used. After cleaning the empty pond thoroughly all the cracks must be chipped with a cold chisel and all the loose concrete removed. Any very small part of a crack can be widened somewhat so that a key for the fresh cement can be made. It is a fact that it is almost impossible to get fresh cement to adhere to old cement; as is said in the trade: "It won't wed." It may appear to do so for a time, but
eventually the fresh application will flake off completely. Still, there are one or two things which you may do to help matters. Having well cleaned the cracks wash them with a next solution of some of the tannins if this is applied with a brush it will ensure a better job, then mix up your concrete, one part of fresh cement to two parts sharp, but not too coarse, sand. Then force this well into the cracks and smooth off to the existing level. I do not think that an overlap of a few inches does any good as this soon tends to flake off. Once you have applied the concrete see that it does not harden too quickly. Shade from the sun and if possible keep damp by fine spraying. This method is often successful and trouble may only recur near the top of the pond, and in the worst case access to the repair.

Should the concrete of the pond be so badly cracked that neither of the above methods will suffice then I recommend that the whole of the pond be refloated over with at least two inches of fresh concrete—seeing that the whole pond gets a thorough coating. To make up for the loss of space due to the extra thickness the edges of the pond may be raised a little.

I often read of "selective breeding to produce fishes with a characteristic trait." How can I do this with my fancy goldfish strain?

A particular trait can be bred into your strain, but the time it takes to do well will depend on how far the trait differs from the normal. Let us take for example the desirability of breeding into a strain of shubunkins a tendency to carry the upper lobe of the tail very well without droop. Its tail need not have the exact shape required for the strain however. From the resultant youngers it will be possible to pick out some fish which have a good shaped tail and also the tendency to carry it better; from these you can breed better ones. Although this will mean inbreeding, this is not as injurious as is sometimes considered with other animals. Fishes appear to come to little harm through this method.

After a few generations it will be possible by judicious pairings and selections to breed in the trait you desire but it must be realised that it is not as speedy a task as breeding some types into tropical fishes. These last breed, as a rule, at an earlier age. Goldfish types will breed at a year old as long as they have been well fed and have had plenty of space, but it will be seen then that this is a task which will call for plenty of patience. But the results should be well worth the effort.

One of my goldfish has a split tail; will it get well again?

Fins of goldfishes will join up again in a few weeks. In fact even if the whole tail-fin is eaten away, say by fungus, it can grow again in a few months. A small split will soon mend and may not leave any trace of damage, but if the damage is very extensive there may remain a knotted scar to disfigure the fish. Scales can also grow again and whilst a fish is convalescing it is essential to make sure that its surroundings are quite healthy; it may be better to separate the fish from others until it is well. Any damaged part of the fish is always more liable to be attacked by fungus than healthy part.

My goldfish fry are growing well but some are much larger than the others. Should I separate the larger ones?

If you find that some of the fry are making much more headway than the others it is essential to catch these large ones and put them into a separate container. Apart from the fact that the larger ones may starve the smaller ones out by getting the lion’s share of the food, it is quite possible that if at all hungry at any time they may make a meal of their smaller brothers and sisters. I have seen fish of weeks of age trying to eat smaller fry of the same hatch, is very difficult to raise a batch of youngsters at exactly the same rate of growth especially if the fry are at all over crowded.

I have a Bristol shubunkin which I think is good enough to show. How should I go about this?

If you have never exhibited a fish before my advice to you is to join an aquarist’s club first of all. You may find there some enthusiasts who would be only too pleased to advise you as to the value of your fish as a show specimen. Most clubs hold table shows and by putting your fish against others you would soon see its true worth. There is nothing better than seeing your fish in a show tank alongside another to assess its real value. You could also visit public shows to see how your fish compares with those exhibited, but until the finer points of judging are pointed out to you it may not be of much benefit to you. It is possible to buy a book the Federation Standards which will help you a good deal. To assess the true value of a fish it is essential that you exhibit, so that you may obtain an outside opinion of it.

My moor goldfish won a first prize at a show before I exhibited it at another show it was unplaced. Why should this be?

It is very difficult to say why your fish did not win at a particular show as there are so many possible reasons. One is that a different judge may have had a fresh view of the fish; all judges do not always think alike. I had the same thing happen to one of my fish last year. A fish which won first and special was unplaced in another show by a judge who put in front of the special prizewinner a fish which the same fish had beaten on two previous occasions. This may have been due to the fact that the special fish may have been rather faded up when it was judged and did not show off to advantage. It may have been temporarily off colour through transport, etc., and you see that although a fish may win once it does not sign that it must do so another time.

Sometimes it is possible to have a word with the judge afterwards, when he may be able to give his reasons for placing. Some fishes are very temperamental when placed in a show tank. I know an aquarist who had a very good shubunkin but it would never win a prize as it immediately sunked when it was placed in a show tank. Most judges are far too busy to wait for a fishes convenience to sh itself off and pass it by for another. Often a fish may not show at its best at the moment of judging. At one shulast season one of my fish was awarded first and special for a fish in the show but the judges left word for me that second prize for fish would have been placed in front of another had it showed its paces when judged as well as it did hour later!

THE AQUARIUM
Live Foods on the Wing

by W. H. Macey

Although the fly is nature’s food for the fish, it is
widely used by the fish-keeping public. Yet, if only
a few of the vast number of flies that invade our
ponds each summer could be easily and conveniently ob-
tained, free from poisonous substances, without swatting, and
in an wholesome state, they would no doubt become far more
important in the diet of fish.

During long spells of dry summer weather, just when the
fish are really hungry, that excellent food the garden worm,
and even the louse, are very scarce. On the other hand the fly is always
available in summer, the water remains clear where it is
fed, and the destruction of a few thousand flies
beneficial to mankind as well as providing our fish
with a ready supply of food.

Fly-traps can be used to catch the flies in numbers,
which will provide an ample daily supply of living flies for
fish. These are obtained by removing them each evening, or a few in
the morning, or whenever they are needed. There is always a
better crop of flies trapped on a cloudy day than a sunny one.

Pickle Jar Traps

One of these traps set and left unattended for several days
will reach to a depth of several inches, for the bodies
of flies trapped today automatically become bait only
for tomorrow. A large pickle jar used as a trap and
containing parts of jam and water to a depth of two
inches, will attract so many common wasps that fifty were timed
in a minute, and the average daily catch per trap
was over twenty. The number of wasps would be increased but for the bodies
forming a complete raft for the late comers
and eventually escape. Few flies escape from
the trap although their bait is solid, but the wasp does

Sectional view of the combined fly-trap and breeder described in
the article

much more crawling and often finds its way out, especially
when the raft has been completed.

Both large and small flies enter the traps, but the larger
species appear to be of most importance as fish food, and
they include the flesh flies better known as blow flies. They
are most abundant in the garden and they produce young,
thus giving them a good 24-hour start over all other species,
and their maggots are capable of floating while others sink and
drown. The greenbottles are always found in company
with the blow fly, so a fairly large number of these enter the
traps, while the greatest of all fly pests, the bluebottle, the
raider of our larders and meat safes, is ensnared in
smaller number throughout the whole year, even in mid-
winter on mild and sunny days. The gentle of this species
is also available at all times. The common wasp when
plentiful will make a substantial increase to the supply of
fly powder.

Rearing Gentles

To obtain gentles and pupae is usually a very messy and
smelly affair, whereas the system suggested reduces mess and
smell to a minimum, and it ensnares the flies as additional
bait. Two large size square pickle jars are used as fly-traps,
each having a quarter inch hole made through one side
centrally and five inches from the bottom. A strongly made
wooden box 8 inches by 8 inches, and 9 inches high, has its
bottom boards extended four inches on one side, the front,
for the fly-traps to rest on. Two half-inch holes are made
in the front of the box five inches from the bottom (inside
measurements), and spaced to correspond with the holes in
the jars. The bottom of the box has several half-inch holes
and at the top edge of each side are three grooves a quarter
of an inch deep, spaced for ventilation. The box is raised
about three inches with wooden battens on each side and
at the back, but not at the front, and a piece of sacking
placed in its bottom.

It is then filled level to the holes with garden soil that
has been passed through a very fine strainer. A flat board
acts as a cover, with a groove made all around on the under-
side half an inch from the edge to prevent rain water entering
the box. The soil must be kept in a fairly dry state. The
fly-traps are stood close to the box with their holes in line
and the bait is placed in the bottom of the jar. When the guppies have had their fill (three to four days), although they are apparently blind, they always crawl away from the light, so will find their way into the darkened box through the holes, or out of the trap and through the grooves at the top. They will be found crawling about and just beneath the soil, while the pupae will be a little deeper. They like four inches of soil above and on either side of them where possible.

The bait for the flies may be fresh fish or raw meat, while a few freshly killed garden slugs or snails are very attractive and their smell is quite mild. However, the bait may be renewed frequently to avoid any unpleasant smell. Traps should be protected from the rain, as water coming in contact with the bait makes it ineffective for a considerable time. To ensure the flies being clean, the bait is placed in a container with a screw-top cover having a few quarter-inch holes made in it, and it may be hung to the mouth of the jar with a piece of fine wire for easy removal and renewal.

The fly-trap shown is a large size pickle jar with the neck and shoulders of a “lighter fuel” bottle as a funnel, and incidentally, this type of funnel fits all pickle jars, preserving jars and one pound jam jars. The jar of the wasp-trap has a three-eighths inch hole made in its neck, and a trap-door fitted on the inside—either a piece of perforated zinc, or a small coil of fine wire hung with adhesive tape. A piece of wood acts as a cover, with a hook for holding the bait container full of jam.

Making Holes in Jars
To make the holes in the necks of the jars, a short straight length of broom handle tubing is used as a bit. A narrow strip of leather with a hole made in it—a square hole will do—just large enough for the bit to rest in is secured around the neck. A little carborundum powder and a few drops of water are placed in the hole, the bit inserted and the grinding started, using a fast-running drill with little or no pressure on it. Occasionally add fresh powder and water and it will take about five minutes to make the hole. To make the hole in the side of the jar, first make a hole in a piece of wood for the bit to rest in. The wood is held in the correct position by an assistant until a depression is made deep enough to prevent the bit from slipping. Then the wood can be removed and the grinding continued until through. It will take a little longer to make a small hole than a large one in glass, and the hardness and thickness of the glass has to be considered.

How to Cut Bottles
To cut the neck and shoulders off a bottle, first dry it inside and out. Stand the bottle on a smooth surface alongside a block of wood high enough for the glass cutter or diamond to rest on and be in the correct position for cutting. The glass cutter is held firmly on the block while the bottle is pressed against the edge of the cutter and turned one complete turn. The bottle is then held horizontally over a candle and turned slowly with the cut in the flame. In a minute or two it will crack and part, usually with a perfectly clean cut, and the sharp edges are smoothed down with any kind of sharpening stone or an old smooth file. Sometimes the bottle will crack all around without parting, but usually parts when allowed to cool. If not, it is placed in the flame again.

About a quarter of the wasps escape from these fly-traps while the raft of dead bodies is forming, and a much larger number when it has been completed. Observing that the wasp, unlike the fly, will force its way through a passage, or push open a light trap-door, the wasp-trap illustrated was used during the summer of 1950. Wasps were very scarce in my locality during that summer, but a few entered the traps and not one was known to escape.

Fly powder is made by collecting the trapped flies and wasps until there are enough for drying. Then they are spread out on a sheet of paper placed in a shallow box, such as the drawer of an old kitchen table. The box is raised off the ground, covered with a sheet of glass and placed in a position where it will receive plenty of sunshine. In a few days both flies and wasps will be dry enough for crushing into a fine powder, using a bottle as a rolling pin.

Automatic Siphon

by L. R. FORD

A n automatic siphon can be easily made, using only rubber tubing and a tin of convenient size.

The rubber tubing should be approximately 0.2 in. internal diameter, preferably thin-walled, and the tin at least 1 1/2 in. diameter and 3 1/2 in. long; if thick-walled tubing is used, a larger tin will be required (I have found that a tin 2 3/4 in. diameter by 6 in. long is suitable).

A small hole (about 0.1 in. to 0.2 in. diameter) is cut in the wall of the rubber tube, about 1 in. from one end—use sharp-pointed scissors to do this. A hole is made in the bottom of the tin so that the rubber tube can just be pushed through and fits tightly; holes are then made round the tin, just below where the lid fits, and the end of the tube inside the tin should be at the level of these holes.

The siphon may be used with or without the lid on the tin, which should be pushed smartly into the water in an inverted position. When the siphon is working the tin may be released, and will float on top of the water, still functioning normally.

When there are small fish in the water being siphoned, it is an advantage to have the lid on, to avoid the fish being sucked through, and in this case the holes round the tin should be smaller and more numerous.
British Aquarists' Festival
Belle Vue, 1951

Over a Thousand Entries Displayed

Mr. Robert Helpmann, well-known ballet star, photographed at the opening ceremony of the B.A.F. last month

Many people have said that the British Aquarists' Festival, held last month at Manchester, marks an important point in the history of British aquariums. It was the largest exhibition ever put on in these islands. It was the first time a show of this scale has been held away from London. The visiting public received with a true desire to see exhibits to take place on a national scale, and the public has manifested that our hobby is in the most exciting stage of its growth. Over 17,000 people visited the Festival from 2nd to 5th May, and now that it has been shown that aquarists living some distance from an aquarist can make entries without personally bringing their stocks, it appears likely that future exhibitions of this kind will need to be on an increasingly larger scale.

In introducing this leading British aquarium and sponsored by The Aquarist, the B.A.F. was opened at the Exhibition Hall, Belle Vue, by Mr. Helpmann. In introducing this leading British aquarium, Mr. Robert Helpmann, President of the B.A.F., said at the opening ceremony that the main aim of the Festival was to publicise the extent and scope of the scientific study of fish-keeping and aquatic in this country and specially in the north of England. It was also an aim of the exhibition to give help to The Aquarist's Hospital Aquarium,

opening the Festival, Mr. Robert Helpmann said that although not an aquarist himself he had heard adequate praise of the interest of the hobby and the restful nature of aquaria for patients. He added that his friend, Miss Margot Finlay, had asked to be present at the Festival to visit the fish pond in the hospital's ward. He said that he was glad, therefore, to have been able to come to open the Festival for aquarists.

Before the Opening

Presentation of a corner bow-fronted tropical aquarium to Mr. Robert Helpmann by Mr. W. W. Coates, (left), Festival Director, and Dr. J. F. Wilkinson, F.N.A.S., President.

morning, and, in fact, for the remaining period the fishes were staged, one of the main problems was to keep temperatures in the tanks down, rather than up! The railway arrivals of fishes at Manchester on Sunday and Monday were according to plan and as several aquarists experienced at fish-showing remarked, the preparations were singularly free from the bustle and confusion that is often taken as an insurmountable preliminary to these events. Judging commenced on the day before opening to the public and was completed the following morning. Over a thousand entries in the 86 classes were made, and the variety of species shown in the tropical section surprised many visitors. The fishes exhibited by breeders revealed the same good work that a number of aquarists in the north have been carrying out, unknown to their southern brothers!

New Standard of Staging

The impressive row of housed tropical aquaria was an exhibit of special delight for the public; these, one thought, were what these visitors wanted to see—how an aquarium can be made to look beautiful in the home. Some novel ideas were tried out, but did not tempt the judges on this occasion. The tanks were all hooded and screened, and placed at eye-level, as was all other staging. Traders who had stands at the B.A.F. combined to put on a display that was quite the equal of any trade exhibition to be seen at leading exhibition halls and the variety of their stocks was indicative of the thought and care that is put to supplying the needs of aquarists these days. Together with the special displays of water gardens, biological exhibits, cacti, reptiles and amphibians and the regularly given film shows and talks, all this added up to a show of which the F.N.A.S. can be justly proud. The Aquarist shares in this pride, and can look forward to the future with the certain knowledge that the valuable experience of this Festival can lead to bigger and better things.
Festival Message
from HERMANN MEINKEN

Distinguished German aquarist visitor to the B.A.F.

I AM very glad that I was able to see the wonderful British Aquarists' Festival, and I must express my great thanks to all my friends in England, especially to Dr. J. F. Wilkinson, President of the Federation of Northern Aquarium Societies, to my old friend Mr. A. Fraser-Brunner, and to The Aquarist which made it possible for me to attend this event.

I was asked to convey the most kind wishes of the President of the Federation of German Aquarium Societies, Dr. K. Kramer, for a successful Festival and to offer also the best regards of the President and members of the Bremen Aquarium Societies. In Germany our opinion is that the success of an exhibition is measured by the numbers of new members of societies and new readers of aquarium journals obtained, rather than by the monetary profit.

I know that this view is also that of British aquarists and it is our hope that this Festival will be followed by an effort to bring about a close international co-operation between European Federations. In writing of co-operation I think of an exchange of monthly news bulletins, aquarium journals articles concerning original research work, perhaps of fishes and plants too, and of exchange visits by aquarists to exhibitions in different countries.

With regard to the British Aquarists' Festival I can but repeat what I have already said—it was the best show I have ever seen in Europe. Especially was I struck by the idea of showing fishes in small individual tanks apart from beautiful furnished aquariums, so that each visitor may easily choose the species he most wants to keep, and then see and obtain advice from the catalogue on how they may be kept; these were quite new features to me.

I regret very much that other German aquarists were not able to see this really grand Festival and that I was forced to return to Germany before the final day of the P.N.A.S Assembly.

London Water taken to Manchester

HIGHLIGHT of the Sunday before the opening of the B.A.F. was the arrival of a party of Hendon Aquatic Society members with their entries. They unloaded these from a conspicuously labelled large van, revealing fish cans bearing the legend "Hendon is Here," and complimentary to Manchester's Water Board, large carboys with labels "Mature London Water." Prominently displaying their club badge on white jackets these enthusiastic aquarists set up their furnished aquarium and distributed their individual fish and plant entries. Several awards went back to Hendon with them on their return journey the following week-end and their happy co-operation in the Festival will long be remembered.

Thanks to advance planning and efficient reception the arrangement by which fishes were forwarded to Belle Vue by rail from various parts of the country proved highly successful. Insulated cans and large thermos flasks were used as travelling fish containers and one aquarist, Mr. H. S. White, of East London, sent a specially made large wooden box, double-walled for heat conservatism, containing his entries in carefully packed glass jars.

A popular exhibit that was unfortunately short-lived was a young octopus, obtained by Mr. Gerald T. Ies from Plymouth for the B.A.F. In the living state, in its aquarium, and later as a preserved exhibit "Oswald" was eagerly sought by the 5,000 school children who visited the Festival in parties organised by their schools. Their visits were often planned to provide a little extra-curricular natural history study, such as the biology class of the Castle Hill County Secondary Boys' School, who has been issued with typewritten questionnaires to fill in during their tour of the exhibition. This practical idea ensured that the boys made observations for themselves and also that they asked questions of the stewards who acted as their guides.
The fishes that travelled the longest distance to Manchester were some cichlids that accompanied Mr. J. Alexander from B.A.R.O., Germany. Mr. Alexander made the B.A.F.'s first stopping place to set up a furnished aquarium entry on his way home to Scotland on his first leave for two years. The thirty-hour journey was not made without difficulties. Before the trip was made Ministry of Agriculture and Fisheries permission had been secured to bring in the fish and water plants; fishes that normally lived together quite peaceably nibbled one another's fins in the close confines of cans; unheated trains added to temperature maintenance troubles and the long spell in darkness did not improve the plants. Mr. Alexander was awarded a special prize in token of his meritorious efforts.

Farthest travelled visitor to the B.A.F. was an Aquarist reader from Nairobi—Mr. S. McKittrick, who was greatly impressed by what he saw. He told us of the delights of keeping tropicals at home in garden ponds and of freedom from worries about tank heating. Two of our oldest readers also made themselves known to us—Mr. C. E. Duke of Preston and Mr. L. Portway of Sheffield (who also successfully entered some fine fishes), friends of our founder Editor. We were pleased to meet Mr. and Mrs. V. Collier, who flew over from Ulster to see the show, and to renew friendship with Mr. Strachan Kerr from Glasgow and aquarists from Torquay and Cardiff.

Plenty of time was available before the opening day for judging to take place and thanks are due to the F.B.A.S. judges who travelled up from the south—Messrs. J. Canfell, C. W. G. Creed, H. P. Lynn, R. G. Mealand, W. G. Phillips and M. Welch. Together with the F.N.A.S. judges, Messrs. H. Loder and G. T. Iles, their decisions were swiftly yet unhurriedly made. Mr. Phillips, the noted puppy specialist, who has been an aquarist for fifty-six years, thought the B.A.F. to be the finest fish show he had seen anywhere; he praised the eye-level staging of hooded tanks and the organisers' provision that judges could withhold awards when standards were not considered to be reached.

A first-class display of biological interest—water animal and plant life of all forms—was made on the stand of the Manchester Microscopical Society, and members of the Society on the stand were kept very busy answering questions and giving demonstrations to visitors. Mr. C. Barwell had arranged a named collection of nearly twenty marine water plants and a fine display of mosses and lichens.

A competitor in the furnished aquarium section who travelled from Germany to set up his tank—Mr. J. Alexander.

Photo: News Chronicle

Suitable for vivarium use. The northern section of the British Herpetological Society also staged a comprehensive exhibition of reptiles and amphibians, also some African lung fishes. A non-competitive row of aquaria showing British fishes including trout, pike, carp, bream, perch, tench, chub and orfe by Mr. E. Chapman of Sheffield Aquarists' Society drew much appreciative comment.

Film shows of aquatic and herpetological interest, six a day, were very popular, as were talks given by Messrs. G. T. Iles, A. Boarder, A. Fraser-Brunner and R. O. B. List. The Exhibition Hall's broadcasting system, in the capable charge of Mr. Chadwick, was an invaluable administrative help, and announcements of new arrivals at the show, of "happily events" in the livebearers' tanks and of spawnings were made regularly. Several species spawned in their exhibition tanks during the B.A.F., indicating that conditions were quite satisfactory for the fishes!

Thanks of The Aquarist and publishers, sponsors of the B.A.F., are due to many individuals and clubs for their interest and work in making the event a success. The following are among those who bore the brunt of the hard work of running a busy show and of keeping a night watch on exhibits—Mr. C. Graham (Chief steward); Belle Vue Aquarist Society, Messrs. A. W. Lowry, H. Hall, C. J. Westwood, W. S. Tracey, E. Radcliffe, D. Radcliffe, H. J. Paynting, A. Polls, B. Dickinson, C. K. Wilson, J. Cranfield, T. Bentley, Mrs. Bentley, Mr. and Mrs. G. Thompson, Messrs. W. Pearson, R. Broughton, J. L. Traynor, A. P. Etton; Salford Aquarist Society, Messrs. E. McDowall, K. Twigg, G. Rankin, D. D. Pendlebury, T. Rowden, A. Spencer, G. Poyser, L. Gregory, R. Kershaw; Mrs. G. Hammond, Mr. E. Chapman, Mrs. Ledger. To these and to officials of the F.N.A.S. and all the other members who gave their enthusiastic support, our grateful thanks.
Display stand of "The Aquarist" (picture above) on which the B.A.F. trophies were exhibited, was placed centrally and formed a break between tropical and coldwater sections of the Exhibition. Souvenir catalogues, magazines, books and booklets were on sale.

Members of a young audience deeply absorbed in one of the film shows provided free for visitors in the cinema adjacent to the show's tropical section are shown on the left.

Pictures of the Exhibition Hall on these pages, were taken immediately prior to the official opening before crowds made it impossible to do so. Part of the coldwater section is shown below. Shubunkin breeder, Mr. G. Handley of Hartlepools A.S., in the picture was given a post-judging view of the entries.
British Aquarists’ Festival 1951 in pictures

Mr. R. Skipper of Haddon A.S. (right, above picture) is seen receiving “The Aquarist” trophy from the Editor of “The Aquarist” for the best exhibit in the water plants section.

The coldwater section was brightened by a colourful pond and water-garden arranged by members of the Southport A.S. (painted left). Part of the run of tropical furnished aquaria is seen on the right.

Mrs. W. Charman, representing the Buckley Press Ltd., publishers of “The Aquarist,” handing the “Daily Dispatch” trophy for the best fish in the show to its winner, Mr. R. R. Brough, during the presentation ceremony at the F.N.A.S. Assembly on 6th May.
Judging Results and Awards


Awards

Section A—Furnished Aquarium


Best Furnished Aquarium, Section A: Blackpool and Fylde Aquatic Society's entry; awarded Caenons Trophy. The aquarium displayed a small shoal of Hypereutroplus tergarius.

Section B.—Coldwater Fishes


Class 15. Oranda, lionhead, celestial, etc. No awards.


Best Coldwater Fish, Section B: Veiltail goldfish (Z. Webb), awarded Belle Vue Ltd Trophy.

Section C.—Guppies


Class 27. Robion (male): 1st—No award; 2nd—H. S. White.

Class 29. Female (coloured): 1st—No award; 2nd and 3rd—G. M. Challans.

Class 30. Female (plain): 1st—No award; 2nd—D. Cannon; 3rd—No award.

Most outstanding guppy, Section C: Doublesows male (J. P. Keene) awarded Guppy Breeders' Society Trophy.

Section D.—Livebearers (pairs of fishes other than guppies)


Classes 39, 40, 41 and 42. Swordtail: 1st—R. R. Brough (Daily Dispatch Trophy for Best Fish Winner); 2nd—H. Walsh; 3rd—D. Collive; V.H.C.—J. Southworth.


Class 44. Other livebearers: 1st—R. Skipper (Philalethes caudimaculatus); 2nd—A. Sunderland; 3rd—D. Cannon (Girardinus metallicus); V.H.C.—B. Penfold (American guppy).

Best Livebearers, Section D: Tuxedo swordtails (R. R. Brough), awarded Fraser-Brunner Trophy.

Section E.—Small Egglayers (pairs)


Class 46. Tiger and ruby barb (B. tetrazona, Pteripinnsysma, nigropunctatus): 1st—W. Sharp (R. nigropunctatus); 2nd—J. East (tiger barb); 3rd—G. Malden (tiger barb); V.H.C.—M. Hepperton (R. nigropunctatus); H.C.—W. Tall (R. nigropunctatus); C.—J. Wild (tiger barb).

An attractive rock garden and pool designed by Mr. C. Graham of the F.N.A.S., in the coldwater section

Class 47. Other barbs: 1st—L. Portway (clown barb); 2nd—S. Davies (P. falciferaus; schilbeus); 3rd—Mrs. M. Thompson (cherry barb); V.H.C.—W. Sharp (cherry and checkerbarred barbs).

Class 48. Rasbora species: 1st—G. Malden (sciong-tail); 2nd—(Mrs.) B. Roberts (Rasbora sp.); 3rd—L. Portway (R. uphyphanauma).

Class 50. Hypseleobryus species: 1st—D. W. Cooke (royal tetra); 2nd—R. Borrowdale (sorpa tetra); 3rd—L. Portway (H. paleugnus); V.H.C.—A. Grant (moon fish); H.C.—A. Rice (Belgian flag tetra); C.—E. L. Calver (glowlight tetra).

Class 51. Homogeobryus species: 1st—L. Portway (beautiful tetra); 2nd—D. Rogers; 3rd—T. S. Hobday (beacon fish); V.H.C.—S. Talbott; H.C.—A. J. Rasley (beacon fish); C.—W. L. Mandleveille (beacon fish).

Class 52. Nannostomus species: 1st—S. Bell (marginied prim fish); 2nd—M. C. McAffee (penis fish); 3rd—D. Shaw (margined prim fish); V.H.C.—J. H. East (Nannostomus sp.); H.C.—L. Portway (prim fish); C.—Mrs. K. Anness (prim fish).

Class 53. Other characins: 1st—W. L. Mandleveille (black widow); 2nd—R. Skipper; 3rd—A. Jackson (black widow); V.H.C.—J. L. Traynor (Congo characin); H.C.—R. Skipper; C.—W. Smith (bunches fish).


Special Prizes

GOOD support was given to the B.A.F. by traders and others who kindly donated the following special prizes: One cash prize of five guineas, two of two guineas and one of one guinea (Federation of Northern Aquarium Societies); 24 ins. by 12 ins. by 12 ins. aquarium (Urmston and District Aquarium Society); "Hyflo" single piston air pump (Mr. and Mrs. C. Hammond, Didsbury); six A.I. thermostats (Angel Electrical Industries, London); cash prize of two guineas (Haydon's, Accrington); copper oil-heating lamp (P. J. Bryant, Bradford); three "Elephant" thermostats (Evans Electronic Developments Ltd., Birmingham); six copies Right Way to Keep Pet Fish (Fish Tanks Ltd., London); ten vouchers, each valued 10s. (W. T. Jeffries, London); fish-house jar and cartoon "Moro" fish food (E. T. Aquaria, London); cartoons "Coral" fish food (Loveras Ltd., Grimsby); "Joyer" de luxe air pump (James North, London); voucher, value 1/4 (Mr. Owen & Sons, St. Helens); four vouchers, each valued one guinea (St. Martin's Aquaria, London); "Reliable" thermostat (Joseph Sashley Ltd., Birmingham); "Littie Wunid" thermostat (The Little Aquarium, Derby); two thermostats, one heater (Shrewsbury Pet Stores, Sidcup); two "Es-El" thermostats, two "Es-El" heaters, two "Es-El" thermostats, two "Es-El" heaters (Kingston Bros., Instruments Ltd., London); two "Geno" thermostats (South Western Aquariums, London); two "Angel" heaters, one copy Electric Aquarium Fishes (Waddington's Pet Stores, Brixton).

Stewards and other B.A.F. helpers at the F.N.A.S. stand, which served as an information bureau at the B.A.F. Mr. C. Graham, chief steward, is on the left.

Show Secretary's Report

ALTHOUGH the B.A.F. was held in the north, I was pleased to see that not all the awards remained there. London aquarists were well represented and have been rewarded for their pains. The general opinion was that most of the fishes were not quite up to southern standards, but those that were good were indeed good. This was evidenced by requests from best known breeders in London for some of the progeny of the very fine pair of Wiesbaden swordtails which took the Daily Dispatch Trophy for the best fish in the show.

The spade work of preparation and stewarding was done with boundless enthusiasm and helped considerably, and for the organisers was one of the great features of the show. Rail dispatch exhibits were dealt with in a fine manner and no fishes were lost, either in transit or by neglect. This opens an entirely new vista for show secretaries in general. A good point to use as an illustration is the fact that fishes from Torquay went back to their owner together with the awards won by him; excuses by aquarists that they haven't the time to bring their fishes to a show can no longer be valid.

Our distinguished visitors returned home full of admiration for the aquarists who were represented at the B.A.F. I take this opportunity of thanking all those who so ably supported me in my work as show secretary.

R. O. B. List

June, 1951

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Over 1,000 Aquarists at F.N.A.S. Assembly

At the Spring Assembly of the Federation of Northern Aquarium Societies the largest attendance of society members yet recorded at one meeting in this country gathered together, on Sunday 6th May. The Festival was open only to the Assembly on this day, and from 10 a.m. to 4.30 p.m. with a break for lunch, members toured the Exhibition Hall. After tea they assembled in the Belle Vue Ballroom to hear an address from the F.N.A.S. President, Dr. J. F. Wilkinson, reports by the treasurer and secretary, and a lecture by Mr. A. Fraser-Brunner. Official presentation of trophies took place before these proceedings.

In his address Dr. Wilkinson thanked donors of trophies and prizes on behalf of the Federation. He recalled how the Federation had arisen from the Belle Vue Society, which before the last war had staged an exhibition in Manchester that had proved extremely popular. The B.A.F. was an undoubted success from the hobby publicity point of view, he said, and he expressed the hope that it would be the forerunner of other co-operative efforts between The Aquarist and the Federation. Dr. Wilkinson foresaw the growth of similar ventures on an international scale, with aquarists from all countries meeting at various large centres in turn.

B.A.F. Trade Exhibits

Useful tip for aquarists was demonstrated on the stand of the manufacturers of “Black Magic” Aquarium Cement at the B.A.F., where a tank that defied the rust-encouraging action of water condensation was shown. Strips of glass had been cemented under the top edge of the frame to project about half an inch beyond it. On the junction of these strips with the edge of the top frame were cemented lengths of glass tubing; these formed a retaining ledge for the glass cover and prevented water from reaching the metal.

The extent of the increasing interest in the hobby was shown by the presence of a large stand erected by Spratts Patent Foods Ltd.—the first time that this well known firm have patronised a show devoted solely to aquarium exhibits. A small pond with water garden and fountain decorated the front of their stand.

Wartime equipment of all kinds has found various peacetime uses, and one unexpected adaptation of a frogman’s diving gear was disclosed by Mr. Jordan of Aquafem, who exhibited at the B.A.F. Men equipped with this apparatus are used to collect the marine animal Sertularia, the skeleton of which is sold as a spawning medium and aquarium decoration.

Fishy newcomers to the tropical aquarium on the stand of Pets and Aquaria Ltd., puzzled many aquarists at the B.A.F. These were the freshwater solee (Trinectes maculatus), one-inch long flat fishes looking, as one aquarist put it, “all the world like an enlarged Argyrocheilus.”

Brook Ltd.’s stand, where a full range of this firm’s products was on show, was shared by kind permission of the exhibitors with an information table for the National Aquarists’ Society. Good publicity for this month’s National Aquarium Exhibition was secured in this way.

Largest display of furnished and stocked aquaria among traders at the B.A.F. was that on the stand of Walter Smith of Manchester. Helping Mr. Smith on this stand, throughout the show, was Mr. R. R. Brough, winner of the Daily Dispatch (Kemsley) Trophy for the best fish exhibited. Untar Aquatic Co. attracted interest to their stand with a display of neons and head and tail lights in one of their new attractive tubular type aquaria on a modern type stand.

Included in a recent importation of S. American fishes from the Orinoco region to Tom C. Saville Ltd. of Nottingham were several new species, including Leporinus striatus and L. friderici. These, together with some unidentified newcomers of the catfish, characin and barb groups were displayed on this trader’s stand at the B.A.F.

Exhibition tanks at the B.A.F. were aerated by Prockter’s aerators, kindly loaned by the Scottish Fisheries. Two of the aerators mounted in special glass casings formed working demonstrations of their power when connected to glass columns of blue fluid on this firm’s B.A.F. display. The stand was manned by Mr. and Mrs. Keene who were attired in Scottish national costumes.

A very large collection of coldwater fishes, in addition to tropical aquarium displays, formed the main attraction of the “Letty Kremmer” Aquarium stand at the B.A.F.

Arrival of a consignment of iguanas for Robert Jackson by air at Manchester’s Ringway Airport was announced on the second day of the B.A.F., and they were delivered to the stand of this trader in the presence of a large crowd of visitors. An oak aquarium, shown on Mr. Jackson’s stand, labelled “Sold to Winston Churchill,” attracted attention of the visitors—an order received the day before the B.A.F. opening.

B.A.F. visitors to the stand of Little Wizard Products Ltd. were able to see the working parts of this firm’s thermostat in a “dissected” instrument and receive advice on setting and adjusting from experts who have recently installed specially designed apparatus in the aquaria at the new Southsea Public Aquarium.

A group of “cats” (Scatophagus argus), believed to be the only ones in the country at present, were shown on the stand of D. and H. Loder of Burnley, Lancs., who also included in their display some attractive cage birds. Mr. Loder supplied live foods for the fishes shown at the B.A.F.

Interference-proof thermostat (“The Elephant”) wired to an electric light bulb mounted in a prominent position on the stand of Stuart Erskine of Birmingham, provided a flashing beacon attraction. The instrument has a rubber bung protecting an aperture into which a key is inserted for setting purposes.
Feeding your Coldwater Fish

Fresh foods can be divided into two classes; dried foods and fresh foods. The dried foods include all the proprietary foods, bread, biscuit meal and Bemax. Fresh foods, raw meat and fish and various live foods such as brine shrimp (Brineps), earthworms, mosquito larvae and live worms are the natural state fish eat only fresh foods. The species eat some vegetable matter. Dried foods are much more convenient to use than fresh foods, but they are inclined to be fattening and constipating. You need not worry so much about this in an established pond as the fish are always browsing around the sides and bottom for small aquatic creatures and plants to eat. In an aquarium your fishes will need some fresh food.

Earthworms are highly thought of as a food for goldfish. Large ones must be chopped up, but smaller ones may be fed whole. They are a nuisance to dig up and messy to cut up so I do not bother with them. My fish seem to thrive on a little fresh or cooked horse flesh purloined from my dogs; don't feed tinned or prepared dog meat to your fish. Raw fish is an excellent food for your fish. Daphnia are good but too expensive to feed in any quantity unless you can collect them from natural waters. Cyclops, a minute creature which may be amongst the Daphnia, will not harm your fish. Mosquito larvae and frog tadpoles are useful if you can get a good number of them.

Bemax is a good dried food but the dust must be sieved from it for large fish. Unfortunately some proprietary foods consist largely of biscuit meal and should therefore not be used often. Above all, remember in feeding your fish that variety is the spice of life.
How to Make a Rock Garden

by W. E. SHEWELL-COOPER

There's many a pool that would be improved by having a rock garden planned somewhere near it so as to make, perhaps, a reason for the pool itself. Of course, if there should happen to be any undulation in the garden, the higher spot is ideal for the rocks and the lower part excellent for the water-garden. Thus, one gets height and depth attained without any artificiality. When the garden is small and there are no definite depressions, it may be necessary to make a mound with varying contours, say to the south side. Here, it can be a regular feature and one might be lucky enough to be able to make a little trickling stream tumble down over the rocks so as to feed the pool below.

Now, it is all very well for the purist to insist that really good rocks must be purchased from long distances. One man insists on the water and weather worn limestone from Derbyshire. Another asks for the special stone from Somerset or from Westmorland. I always think it is much nicer to use the rock which is indigenous to the particular county. I have seen gardens in Kent where the good old Kentish rag has been used. Folk in Sussex have made some very attractive little rock gardens with the typical sandstone of that county. Friends in Wales have used granite, as have experts in Devon and Cornwall.

If the garden can be made with stone found in the district, of course, it will be cheaper, but remember that it is always better for such stone to be dug out of the hillside and not be quarried out of the bowels of the earth. It's the weathered stone which has the natural appearance. Quarried stone somehow always looks too neat. Make it a rule that you are going to bury about three quarters of the stone in the soil; that will give you an idea as to how big rocks you will have to buy. The best side of the rock should always be visible and the quarried edges may be hidden beneath the earth.

For small rock gardens, I always insist that the two main stones should weigh at least five cwt. each, while the others used in the build up should weigh about one cwt. a piece. You will see by this, that I am appealing for rocks to be used and not just stones. We must get away from those so-called rockeries which used to be the vogue in the Edwardian era.

You know the kind of mound I mean—with stones just sticking out of it like almonds out of a trifle.

People are horrified when I say that it is possible to make one's own rocks by means of concrete. A large irregular hole in the earth of the shape and size required is prepared. The hole is sprinkled well with sand to give the surface of the artificial rock the texture desired. Once the outline of the hole is lined with cement, it is possible to use old tins and jam pots as a centre, of course, making sure that these are well covered. The "rock" will then be lighter to handle. It must be left to harden in its hole and this usually takes about three days.

The main drawback of course, to the concrete rocks is that they take a very long time to weather and they tend always to look what they are. I merely mention them because there are some who just can't afford to buy the proper rocks and they may like to try their hand at producing something as near nature as possible. Incidentally the growth of lichen on these "rocks" will be encouraged if, when dry, they are painted with a mixture of flour, milk and water. One man bought one or two real rocks and used them as the basis for the earth moulds to make others of a similar size and shape.

Having shocked some readers by this suggestion, I must now pass on to the actual making of the garden—that is the placing of the rocks in the right position. One gets the right idea by studying the small outcrops one sees on hill-sides. These rocky outcrops will give you an idea of what the original material was deposited and then there will be the secondary lines caused by what geologists may call the earth's upheaval.

Thus, when building the rock garden, we usually start at the lowest point and having bedded the lower rocks in their right strata or as some people call it, at their proper angle, the other rocks can then be placed in position, the general slope of the strata being followed right the way through. The rocks should be put in sufficiently deeply, as advised previously, and they should have a backward slope so as to help get the rain down to the roots of the plants and not to take it away from them.

When placing the rocks in position, look at them carefully and see whether there are any particular markings. Look at the graining because this may well determine where the big stones are to be placed. It is always a good thing to keep the same type of stone together. A big group of rocks is often better than little groups of small ones. Choose for the top of the rock garden the more rounded stones only, for these give the right appearance of actual weathering. As the stones go into position, place suitable soil behind and roundabout them and ram this in tightly. The "pockets" or planting areas should appear quite naturally and sometimes these will be quite large.
A Day in the Life of a Curator

by L. R. BRIGHTWELL

A LITTLE while ago I quite inadvertently overheard this scrap of conversation in the darkness of the London Zoo Aquarium: "Well, you see dear, everyone's doing it, they're all off on a little tour or something. I suppose perhaps you, being an F.Z.S. . . ."

"A matter of fact I've only been one a week, so of course there isn't a frightful lot of influence as yet. I suppose you wouldn't like him to look after elephants or monkeys?"

"No, I suppose not. as its curator of course not a common keepah . . . ." Then the ladies decided out of ear-shot and Harold's future as a celebrity in the aquarium world remained undetermined. But one thing was certain, the general conception of curatoring a big public aquarium is much as pictured by those ladies; a nice clean, steady job, one of the few really restful jobs in a world. It has been my privilege to know with intimacy a number of aquarium curators, and so can present the following as a fair picture of the real thing—not what it is imagined to be like.

Early Starters

The Aquarium staff, anything from five to fifteen men and the engineers, arrives at 8 or even 7 a.m. No. 1, the head keeper, makes a detailed survey of anything up to a hundred tanks, with capacities of from thirty to four or even thousand gallons. Dead animals are removed and, if at all likely to be of museum or laboratory value suitably fixed. Various museum and other people must be notified. Ailing beasts are removed to isolation and reserve tanks, every floor is sniffed and the observation windows cleaned, inside and out. Then comes the checking of temperatures, testing for salinity, and especially, pH, with a colour comparator. And No. 1, by the way, has not yet sat down to his job with a string of academic letters after his name. He started years ago, right at the bottom, as a floor sweeper and washer of sand—a fine job for developing the bispeck.

Nine a.m. sees the arrival of the great man himself. He has just digested No. 1's detailed report, embarks on a survey of the whole place from show tanks to reservoirs and sand beds. "Take nothing for granted" is the motto of every successful Aquarium as well as the Royal Society's. A

An Aquarium Curator's nightmare—a tank burst
curator's holiday, just a few weeks each year, is more often than not of the busman's variety; responsibility is ever at his elbow, and gets into bed with him at night.

"Not much worse than my job so far, allowing for the bigger scale," says the private fish-house owner. But the difference becomes manifest when the curator, on his way back to the office to deal with a mountain of correspondence, passes for a few moments' purely aesthetic enjoyment before some favourite exhibit. Immediately the phone rings and keeps on ringing between opening envelopes and dictating letters. The phone calls vary from intelligent business enquiries to cooing, seductive voices asking him if he knows of a fish with five—or else thirteen letters—in its name, and the first letter is Z and the last G, or perhaps W, but the print's so bad the enquirer can't be certain which.

In the middle of considering a particularly knotty letter there enters by one door a clerk desiring his immediate attention upon some wealthy patron no Aquarium can afford to snub, whilst from another door comes No. 1, who silently lays upon his chief's desk what appears to be a fossil sausage very heavily encrusted with iron filings. He mentions that there are plenty more such exhibits available.

Pipes and Pressures

This object on the desk represents what was a year ago a section of the aquarium's mile or more of feed pipes; it has now given up the fight. Ironically enough the big scale marine aquarist's life is one long fight against the very fluid which is the life blood of his always difficult to keep, and often costly, exhibits. Only when tank and service fittings can be made of solid gold is this struggle likely to end. The perfect, sea-water-proof insulating medium is yet to come. Sea water too has a way of " pitting" the steam cocks in the engine room, with the result that salt water is sucked into the boiler, so jeopardising the temperatures of the tropical tanks, when of course anything may happen.

Few visitors, even if home aquarists, realise that the glass fronts of big exhibition tanks are held in place simply by the enormous pressure of the water behind them. The curator's nightmare is a tank burst. It was found in the London Zoo Aquarium's early days that the observation windows of the 4,500 gallon tanks were just six inches too tall. This, however, was not appreciated until one morning. Luckily before opening time, a tank burst and some giant congers were swept into the stoke hole. Glass fragments

(Continued at the foot of next page)
A “New Innes”


NEW editions of the book about which it is most certainly true to stay that no serious tropical fish-keeper is ever without, have come to be accepted and anticipated events by aquarists. The twelfth “new Innes” does not disappoint and retains its premier position in English aquarium literature. The growing appendix of earlier editions has been removed and its contents dispersed to their proper positions in the book; new photographs and new fishes have been added; name changes have been incorporated.

This is the only book that can be offered in response to the query from the hopeful beginner who wants to buy a book “with all the information.” Exotic Aquarium Fishes does not contain it “all” (no single volume ever will), but it goes further in this direction than others, and it is the unpretentious manner with which it does so, together with the beauty of its illustrations, that have made it so popular.

Fishes as Pets


The author of this new book is an experienced aquarium trader and he brings to the task of presenting information for the beginner several new aspects. Thus, chapters with advice on choosing a dealer and dealing—customer relations are included, and the author has clearly intended that where possible his book shall answer the questions most frequently put by his customers.

It is a pity though, that a book that has much of value for beginners has been so loosely written. Its aquarium chemistry is very muddled (e.g., page 17); “smells” are accused of causing water troubles; “flukes is an irritant disease” (page 81); mis-spelt names and mis-used terms (e.g., “oxygenations”) occur. Such faults mar an otherwise useful little book.

Water in the Garden


A LITTLE brother to the author’s well-known Water Gardening, this book will be read with pleasure by pondkeepers and those planning to make decorative garden pools. Greatest emphasis, and rightly so in a book by an authority in this sphere, is placed on plant life, both aquatic and sub-aquatic; the would-be water-gardener is helped to select, plant, maintain and propagate his stocks and told how to make a home for them. The book is attractively laid out and its illustrations are specially fine.

Pond Life


FOR the naturalist the natural pond is the most rewarding site for observation that can be chosen. Nowhere else do animal and plant life occur in such profusion and diversity of type, except at the seashore. Mr. Ford’s book sets out to show the young naturalist what he can hope to find in and at the pondside, and details for him the interesting habits of many of the animals. With such wealth of material a small introductory book such as this one, planned to cover all interests—trees, plants, water mammals, fishes, aquatic insects and other invertebrates, as well as microscopic water life—cannot give other than a superficial treatment of the subjects, but the choice has been well made and will stimulate further reading. Directions for making a garden pond are given in the final chapter. The photographs in the book are by Lionel E. Day and they greatly increase its value.

Reptiles of North America

Zwischen Atlantik und Pazifik, by Robert Merritts. German text. 160 pages. 60 photographs. Alfred Kerner Verlag, Stuttgart, Germany. DM 9.50.

HERPTOLOGISTS able to read German will find plenty to delight and interest them in this new book by Professor Dr. Robert Merritts, director of the Senckenberg Museum and professor in Frankfurt University. It is largely an account of his own observations of reptiles and amphibia that he made at museums, zoos and scientific institutions in N. America during his visit there in 1949. The photographs, some very fine studies of American reptiles among them, include pictures taken at the Florida Oceanarium and the San Diego Zoo reptilaries.

New Aquarist Booklet


THIS latest booklet in our series is designed to provide an introduction to the most usually kept egg-laying tropical fishes and to give the beginner guidance in breeding them. The fishes are grouped in natural families with handy reference lists of popular and scientific names and countries of origin; useful advice on special breeding aids for particular species is given as well as directions for feeding and general care. One section deals briefly with treatments for some common ailments of tropical fishes.

A Day in the Life of a Curator

(Continued from previous page)

were hurled twenty yards distant, one transfixing a turbog—
the only casualty. It may be mentioned that aquarium
fishes, however well nourished, eat with a certain “wooliness,”
and that even in well aerated and plankton-rich water
aquaria mackerel and herring develop “chubbed heads”
and queer kinks in their spines.

Spring brings the curator the richest harvest of ‘phone
calls—the pond owners, not yet roped into and educated by
aquatic societies, being chiefly responsible: “There are a
lot of dead frogs floating on my pond. Ought I to take
them out or will the goldfish eat them?” No, that it is not
a journalistic invention, and it is mild beside some of the
enquiries received.

Finance is a peculiarly delicate, even distressing subject
nowadays, so I do not propose to wind up this article with
even a hint at the salary of a big scale aquarium curator.
But it is safe to say this: an Aquarium reflects its curator as
mercilessly as a dog its master. If the Aquarium is a good
one, the man at the wheel more than deserves whatever it
is the inland revenue leaves for his private uses and lawful
enjoyment.
EASY TO MAKE—

Fish-house Heater

A n inexpensive convector-type heater, useful to the aquarist with a fish house or conservatory, etc., can be made for a few shillings.

Materials required are:—Empty 5-gallon drum (approx. diameter 14 ins.) ; boiling ring, 700-watt ; two pieces of 1 in. mild steel strip, each 22 ins. long; six nuts and bolts, 3/16 in. Whit.; twelve washers, 3/16 in.; sufficient 3-core cable to connect to mains.

Fig. 1

First cut off the top of the drum, clean and dry it. Perforate bottom (which will now become the top) and sides with fair sized holes. Take the steel strips, bend at right angles 4 ins. from each end, and drill two holes (A and B) in each piece (Fig. 1), and bolt together in the form of a cross. Then drill two more holes (X and Y) the same distance apart as the holes in the boiling ring (Fig. 2). Using six washers each side, fix the boiling ring in position as in sketch.

Fig. 2

Drill four more holes in legs (M), and four to match at open end of drum. Fix the three-core cable to the heater, the red and black as mains, and the green wire to the fixing bolt holding down the boiling ring. Lower the drum into position, bringing the cable through one of the ventilating holes, bolt into position, and the heater is complete, as sketch.

The whole costs about six shillings, and is really efficient.

A. L. Myatt

June, 1951

The AQUARIST Crossword

Compiled by J. LAUGHLAND

CLAUES ACROSS
1. Pertaining to propagation (12)
2. Sabu tridens (7, 5)
3. 9 — wife, U.S.A. (Shad) (3)
4. Skin of Jap eel (4)
5. Ide (4)
6. One called, as Ameoba (11)
7. Grayling (9)
8. Small glass vessel (4)
9. Fish from the Sargasso (5)
10. Water this is really a mole (3)
11. Earth-embracing abbrevia-
tion (3)
12. These fish killed a British
King (8)
14. Perch (3)
15. The Italian (2)
16. Usually brightest and small-
est fishes (5)
17. One end of Centigrade—and
of your fish (4)
18. You can't have it and eat it (4)
19. Comes back with two—on
paper (6)
20. Mid-tank (2)

CLAUES DOWN
1. The pericardial cavity of a fish houses: (a) The heart. (b) The brain. (c) The stomach. (d) The liver.
2. The popular name of Ameoba is: (a) Bladderwort. (b) Crystalwort. (c) Fairy Moss. (d) Frog-bit
3. The disease known as costitis is caused by: (a) A protozoan parasite. (b) A fungoid growth. (c) A bacterium. (d) A free-swimming crustacean.
4. The Victoria Regia was first flowered in England at: (a) Chatworth (b) Blenheim. (c) Kew. (d) Wisley.
5. Corynorhynchus is native to: (a) Ecuador and Colombia. (b) Peru and Chile. (c) Uruguay and Paraguay. (d) Venezuela and Trinidad.
6. The scientific name of the Cuban live-bearer is: (a) Lmica heterandria (b) Gambusia punctata. (c)_QUINANIA ANTRONIA. (d) Amare cruentus.

(Solutions overpage)
News from Aquarium Societies

Aquarist’s Calendar

9th June: Federation of British Aquatic Societies Assembly, 2.30 p.m. at Friends House, Euston Road, London
14th-16th June: National Aquarists’ Society Annual at the Royal Horticultural Hall, Vincent Square, Westminster
29th-30th June: Wembley and District Aquarium Association First Annual Open Show at St. John’s Hall, Avenue, Wembley, Middlesex
6th-8th July: Kodak Aquarist Section’s Second Annual exhibition at Kodak Hall, Wealdstone, Middlesex
7th-14th July: Leicester Aquarist Society Exhibition Y.M.C.A. Hall, Granby Street (near London Road Station), Leicester
28th July: Federation of British Aquatic Societies Assembly, 2.30 p.m. at Friends House, Euston Road, London
26th July: Romford Aquarist Society Open Show at the L & H Hall, Western Road, Romford, Essex.

New Societies

INAUGURAL meeting of the Dublin Society of Aquarists was attended by thirty-six aquarists. Meetings are to be held at 8 p.m. on the third Friday of each month. Full details may be obtained from the Secretary, Mrs. W. H. Godden, 6, C envoy Street, Parkgate, Dublin.

NEW society in Buckinghamshire is the High Wycombe and District Aquarist Club formed in April. Secretary is Mrs. D. Brown, 170, Desborough Road, High Wycombe, Bucks, who will welcome enquiries from other aquarists in the locality.

MEETING place of the newly formed Lambeth Aquarists’ Society is to be the Kings Head Hotel, Norwood High Street, S.E.27 where members will assemble every other Wednesday commencing 9th May.

SECRETARY of the Leigh and District Aquarists’ Society is Mr. K. Ratcliffe, 28, Cook Street, Leigh, Lancs, who will be pleased to hear from aquarists in the district.

Entries Invited

Wembley and District Aquarium and Pool Association’s First Annual Open Show: 21 classes for tropical and coldwater fishes. Schedules available from Show Secretary, Mr. W. P. Plessar, 10, Turton Road, Wembley, Middlesex. Date: 28th-30th June.

Hendon and District Aquatic Society Open Festival Show. Schedules from D. Cameron, 7, Courtleigh, Bridge Lane, Golders Green, N.W.11. Date: 6th August.

Romford Aquarist Society Open Show: 21 classes in over 250 aquaria. Schedules and entry forms from Mr. H. Mace, 78, Belgrave Avenue, Gidea Park, Romford, Essex. Date: 26th July.

Crossword Solution

REPRODUCTIVE
MALVACE
BARREL

PECTAL

UPPER

RARE

KEY

TARPON

PICK YOUR ANSWER (Solution)

1 (a). 2 (c). 3 (a). 4 (a). 5 (d). 6 (c). 6 marks—Congratulations; 5 marks—Excellent; 4 marks—Good; 2 marks—Fair; 1 mark—Poor; 0 marks—
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