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and Pondkeeper

DECEMBER, 1962



MONTHLY  
Vol. XXVII No. 9

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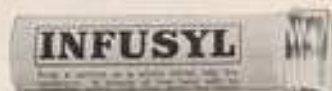


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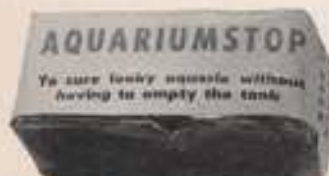
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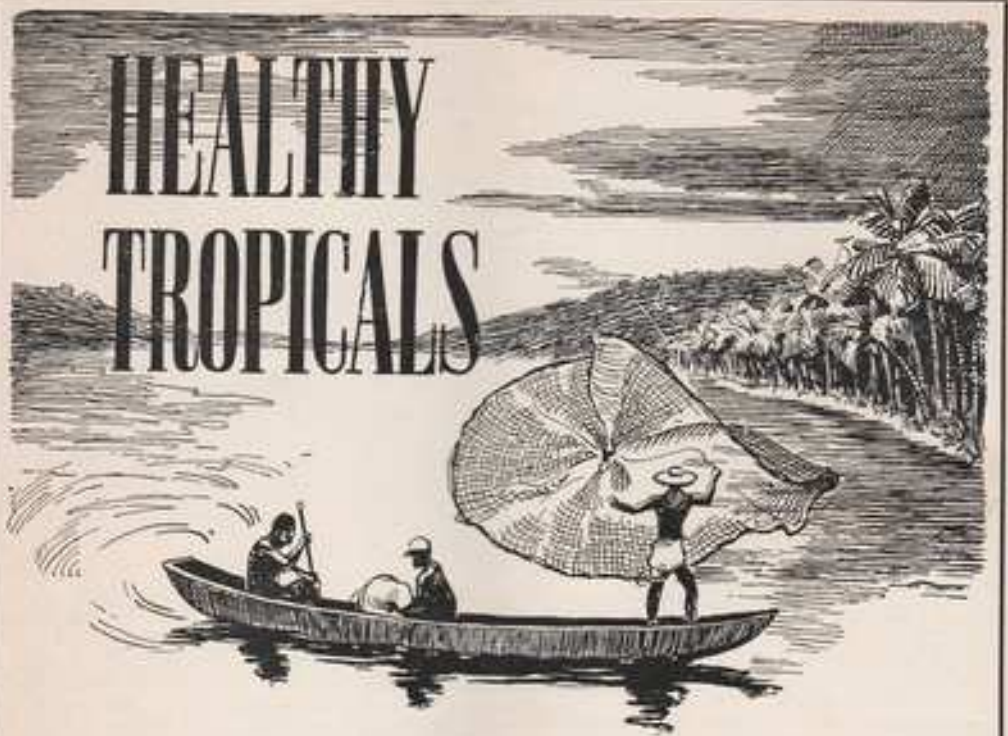
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# The AQUARIST AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"



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## An African Fish in China

A TROPICAL fish from Africa the tilapia has always fascinated fish fanciers and experts alike with its unique maternal instincts. Taking no chances, mother tilapia hatches her eggs in her own mouth. After hatching, the baby tilapia ride about in perfect safety in their mother's mouth until they are old enough to fend for themselves. Even then, mother still offers the same haven should danger arise.

Two parent tilapia, taken from a pilot pond of the Fukien Fisheries Research Institute, which I visited recently, gave an on the spot performance when one spat out a dozen eggs at a time and another just as many day-old fry. They were netted for their routine check-up by the Institute's experts engaged in the work of adapting this species to the colder waters of China. The performance was given when their mouths were pried open in the course of the examination.

The biggest headache, in the opinion of the experts, has been getting this type of fish to live through the winter months which it never knew before.

African carp is the name popularly used in China because of its resemblance to a favourite Chinese fish. However, it has no relation to the carp since it belongs to the bass family. Its scientific name is *Tilapia mossambica* Peters and is a native of the Mozambique Bay area in tropical East Africa, where, because of its prolificity, it makes up some 70 per cent of the fish population in its home waters. Removed from its tropical home, it dies when the water temperature drops to 53-57°F (12-14°C). It thrives best between 77° and 95°F (26-35°C).

The first serious acclimatisation effort in China was made in 1956 in Kwangtung of southern China. The first winter all the fish died when the mercury suddenly dropped to 52°F (11°C). The next year this fish was raised in warmer waters of the province, on the northern tip of Hainan Island. This proved successful and the fish was launched on its career as a new table delicacy of the sub-tropical south. The more organic matter present in the mud the warmer it becomes, it has been found.

In Fukien, another sub-tropical province to the north of Kwangtung, acclimatisation started in 1958. In the Amoy pilot pond, five parent fish from Hainan's first generations successfully lived through 59°F (10°C), though most died in other places during the first winter.

From the pioneer quintet, the Amoy pisciculturists summarised the local conditions necessary for its safe wintering in an area about 4.5 degrees or 310 nautical miles



A shoal of small tilapia seen at the surface of a pond

farther north. Amoy is about 24.5 degrees latitude north.

Water temperature, soil composition, iron content of water, constitution and age of the individual fish were some of the factors found relative to the success. Iron content of 0.3 milligram per litre has been found best for the minimal water temperature of, say, 40°F (4.5°C). Father tilapia digs holes in the relatively warmer mud bottom for the "family" the moment the weather turns cold.

After 5 years' work, this tropical guest, which has come by way of northern Vietnam, is now comfortably settled down in most of Fukien. It safely went through a winter water temperature of 34-46°F (7-8°C) in 1960 and a record low of 39°F (4°C) in February this year, the coldest Amoy has known in many years.

In the opinion of the head of the Fukien Institute, Professor Huang Wen-feng, the job of acclimatization has primarily been concluded for sub-tropical Fukien. The next important job is selection of quality strains, analysis of feed, tilapia diseases and the effects of raising it in rice fields.

Many fisheries in Fukien have taken to raising tilapia on a commercial scale in the past 2 years. Fukien growers have also started stocking it in ponds fed by hot springs in winter. Successful breeding is reported in temperature ranges between 54° and 77°F (12-25°C).

In the field of research, the work of adapting tilapia to much colder climates has been undertaken. The Tsingtao

Fisheries Research Institute is one of the many that have sent for parent fish from Amoy. Tsingtao, a coastal port at latitude 34 degrees north, is below zero in winter.

In the opinion of the head of the Fukien Institute, almost any part of the rest of China can raise tilapia for the table in the 6 to 9 months that are warm enough during the year. The problem of local propagation can also be solved by keeping a few sturdy parent fish indoors, where winter water temperature can be easily maintained.

The prolificacy of tilapia is legendary. A female fish lays four or five batches of eggs a year, and a tilapia fry matures in 3 or 4 months. Thus it runs to some 20,000 fish from one mother fish in a year.

Another reason the tilapia is welcomed in China is that there is no need to worry about the safe transportation of millions of fry, an age-old practice for the traditional domesticated Chinese fishes. With the newcomer, all that is needed is to send a dozen parent fish in a convenient container, at only a fraction of the cost and trouble.

A recent endurance test was made by the Fukien Institute when two full grown female fish were left high and dry for as long as 2 hours. After that they were found to be able to live and propagate as usual, a feat unknown to other domesticated fish in China.

*Clib Fu-jen*



A fisheries worker holds a 2-year-old tilapia in his hand

A Merry Christmas to all readers of  
The Aquarist — from the Editor and Staff



# Breeding the Texas Cichlid

(*Herichthys cyanoguttatus*)

by ROBIN SANDERS

I HAVE kept Texas cichlids now for over 2 years, and have had varying degrees of success in breeding them. The last spawning proved the most fruitful, and I was able to rear 30 of these delightful cichlids, which are now about 2 inches long and nearly ready to breed themselves.

In the wild, these fish are found in Mexico and Texas, as the name suggests, and here they grow to a length of 7 to 9 inches. In an aquarium, however, 5 or 6 inches would seem to be all that the aquarist can reasonably hope for, but they will breed when just over 2 inches.

## Colour and Age

In colour this fish when mature is of a greyish tone, thickly sprinkled with small, light, round dots. When young it is almost indistinguishable from the blue acara, its more common relative. However, with maturity the colours in the Texas cichlid become more pronounced, and the male in breeding condition is truly gorgeous, having a green sheen to his body caused by the multitude of tiny dots. The female, in comparison, is a little drab, showing dark vertical bars, and she is also slightly smaller.

All the books on the subject of cichlids recommended a tank of not less than 36 in. by 15 in. by 15 in. for breeding purposes. However, once my pair had spawned I found that they would happily spawn again in a tank as small as 15 in. by 12 in. by 12 in.

The bottom of the tank should be covered with clean sand or gravel, and a few flat rocks should be included. Plants are unnecessary, and will not be tolerated by the spawning cichlids, who will tug them out and possibly damage them.

## Preparation for Breeding

The preparation of the pair of fish before being introduced into the tank is very important. A male should show good colour and the female should be plump. If it is possible to keep them in separate tanks for a week or 10 days before introducing them in the breeding tank this should be done, and they should be well fed on *Tubifex*, earthworms, *Daphnia*, raw meat or even (dare I suggest?) small guppies. This separation is not essential if the pair have spawned before, but it is valuable if they have not.

When the time arrives to put the pair in the breeding tank it will again be worthwhile to separate them by means of a glass partition. This has proved successful in exciting the fish at an early stage, as well as allowing the pair to become accustomed to their surroundings.

Soon the male will start the typical cichlid pre-spawning activity of shaking his whole body violently, picking up mouthfuls of sand and spitting them out again, and tugging with his mouth at the rockwork. His colour will intensify as he shows off to the female on the other side of the partition. When she responds and starts spitting mouthfuls of sand herself, the aquarist should remove the partition. These activities will continue, and the pair may tug at one another's lips, as if 'kissing'. It is at this stage that the aquarist should be careful, lest the female take fright, when she may be damaged by the male, but I have always found the male Texas cichlid, unlike many other cichlids, to be very mild and good tempered.

The pair will eventually select and clean a rock on which to lay their eggs. The cleaning process is very thorough, and is carried out with their mouths and by a fanning action of their fins.

## Spawning

The spawning process takes about an hour, occasionally a little longer. When it is completed the parents take it in turn to guard their eggs, which are clearly visible, resembling miniature pearls (except that they are semi-transparent). They will be seen to be fanning the eggs continuously. This is to prevent any dirt settling on them. They will fearlessly attack any other fish, or even bite the aquarist's fingers whilst they are guarding their eggs.

After spawning, the parents will welcome a spoonful of *Tubifex* or something similar, as they will not unnaturally by now have a large appetite. Also, at this stage, it is advisable to add just sufficient methylene blue (5 per cent solution) to the water to turn it a very light blue. This will not harm the fish, but will prevent fungus from attacking the eggs.

The fry will hatch in 3 days, but will not become free-swimming until the seventh day. During this time the parents, still guarding their young continuously, will often transfer them around the tank in their mouths, to depressions dug in the sand. The more disturbances they are subjected to, the more often they will transfer their nest.

How long should the parents be left with the young? This is the vexing question asked by many aquarists, and nearly every cichlid breeder would provide a different answer. There comes a time when family ties become weak, and are overcome by the appetite of the parents. Personally, I remove the parents once the fry are free-swimming, but it is a great temptation to watch the parents shepherding their school of young as they swim round the tank. It is this parental care that makes the breeding of cichlids so worthwhile.

The fry will eat brine shrimp in the first week, and are soon big enough to take *Tubifex* and white worms. There is no problem here of preparing *Infusoria*.

## Avoid Overcrowding

The only difficulty I encountered in rearing this variety was in ensuring they were not overcrowded. But 30 youngsters grew quite happily in a 3 ft. tank for 3 months, and then I transferred them to a 50 gallon 4 ft. tank, where they are now doing very well. But a smaller number would have grown to maturity in the 3 ft. tank, so that this fish is a proposition for anyone interested who has a medium-sized tank. When young they are not troublesome in a community tank, even with fish as small as neon tetras. It is advisable though, to transfer them to a tank with larger fishes, once they attain a size of 1½-2 in. Even when full grown they will live quietly and peacefully with large barbs, fighters and other large fishes. Too much has been written in the past about the unsuitability of large and medium sized cichlids for the average aquarist. Admittedly, one has to be careful to choose a peaceful variety, but here is one—the Texas cichlid.

# The Desert Ground Gecko



An adult desert ground gecko, showing the mating spurs at the base of the tail. This specimen is unusual in retaining the banded pattern of coloration.

by ROBERT BUSTARD, B.Sc.

*Photographs by the author*

THE desert ground gecko (*Coleonyx variegatus*) lives in regions of California, Arizona and Nevada in the south-western United States. It is a small lizard with a total length of about 6 inches, of which half is tail. The coloration is variable. Youngsters have a banded pattern with five broad, dark brown bands across the body, but as they grow, the bands start to break up, and dark spots appear in the previously uniform light areas between the dark bands. The banded appearance is seen in specimens up to about 4 inches in length, when it usually starts to disrupt, and many old adults have the banded pattern completely replaced by spots. The ground colour is a dull yellow with a pinky suffusion.

The desert ground gecko, in common with all the members of its genus, has a number of interesting features, some of which are unusual in geckos. In the first place they have well lidded eyes, whereas most geckos, like snakes, lack eyelids but possess a transparent spectacle that covers the eye. Climbing is not a strong point with the ground geckos. The popular idea of geckos is of small lizards running up the walls of houses, and across ceilings upside down, in the tropics. Many geckos, however, are poor climbers, and lack the adhesive lamellae which all the excellent climbers possess in a most advanced state. In common with many geckos *Coleonyx variegatus* possesses a

fat tail, which is not as well developed as in certain other species. The tail serves as a food store, which may be drawn upon in times of need, and in captivity where food is usually plentiful, the tails are normally well rounded. They commonly reach a diameter of about 7 mm. at a distance of about one-third of the way down from the base, and a weight accounting for almost 20 per cent of the gecko's weight of approximately 5-8 grams.

The geckos live extremely well in captivity and there are records of specimens surviving for periods of 10 years and over. Many geckos prefer winged insects as food but *Coleonyx variegatus* are quite happy to accept mealworms as basic fare. I have established a community of these geckos to study their behaviour and to breed them. They are housed in a vivarium measuring 30 in. by 20 in. by 20 in. and the simple furnishings include a 2 in. layer of dry peat covered with  $\frac{1}{4}$  in. of sand, and several pieces of bark to provide basking sites and hiding places. There is also a small water dish sunk into the sand and two little succulent plants are included more for my satisfaction than for that of the geckos.

The vivarium is heated by a carbon heater lamp instead of the usual pearl electric light bulb. The former is preferable for geckos because they tend to be nocturnal, or more accurately crepuscular (creatures of the twilight or

evening, and bright lights are less suitable. The carbon burner lamps provide the necessary heat but a much softened light, which is still quite sufficient for observation. The lights in my vivarium are switched on at about 9 a.m. and remain on for about 12 hours. The day temperature runs to about 86°F (30°C) and the night temperature averages about 60°F (16°C). This is quite suitable, as in desert regions there tends to be a large day to night differential in temperature.

Shortly after my dozen specimens had settled in I received a pleasant surprise—they were almost all out basking on the bark slabs at 10 a.m. and in the light of the bulbs. The only specimens which are seldom seen out during the day time are the two immature females. These are decidedly shy and are never seen basking during the day, even after several months in captivity. It may well be that temperature is the main factor which makes them evening creatures in the deserts where they live, where it will be too hot during the day. They are said to have an optimum temperature of about 82-84°F (28-29°C), and I have tried to provide this in the vivarium. The result is that shortly after the lights are switched on in the morning they come out to bask and move leisurely around. They are then in view for most of the day, although around 5-6 p.m. they tend to disappear and only a few are visible at any one time until the lights are switched off.

Without doubt the maximum activity takes place shortly after the lights have been switched off in the evening. Sexual activity is not seen during the day, but commences very shortly after the lights are put off in the evening. I have watched numerous matings and at present my females are starting to lay; each female lays a pair of very large oblong eggs. I am hoping to be successful in providing suitable surroundings for them to lay their eggs naturally (this can often be troublesome with lizards) and that I shall be successful in hatching them. I shall report in due course on my results and give tips for those collectors who would like to try for themselves.

These ground geckos are certainly among the easiest species to keep and a pair could be kept quite successfully with the conditions outlined above. In addition to meal-



An example of camouflage—a ground gecko on sand

worms, flies and blackberries can be given but these should have their movements somewhat restricted as the geckos do not hunt their prey very rapidly.

Unlike some geckos, they are very easy to sex as male specimens possess a pair of external mating spurs, which can be seen at the sides of the tail base. Specimens, when available, are likely to cost about 30s. but against this is the knowledge that they are most entertaining to watch and should survive for 10 and perhaps 15 years with very little attention. An original pair might produce a colony if the eggs are carefully incubated and the young reared. Females will provide at least two clutches of eggs during the summer months and the young almost certainly breed when they are 2 years old.

## What's in a Name?

ONE could hardly say that the subject of this note is original! Indeed, it is an old and familiar cry that asks, "Why must authors always include scientific names when referring to fishes and such?" The answer is a simple one even though it may not appear obvious to the layman. *Scientific names are given so that the reader may know exactly to what particular fish reference is made.*

The importance of this will be realized if the following points are suggested: (a) the existence of large groups of similar fishes, e.g. there are over 20 different species of *Rubens* and more than the same number of the various tetras; (b) two species of the same genus can look so much alike that it necessitates a scale count to determine which is which, and yet their breeding or environmental requirements may differ considerably; (c) a fish known in one part of the country by a particular "common" name may be known elsewhere by another; an example of this is *Brachygnathus dorsalis*, which is known in some areas as the bumblebee fish and elsewhere as the wasp goby.

Scientific names assist the reader in identifying the exact species referred to so that blunders by mis-identification can be avoided. Even though a great amount of trouble is taken in selecting and registering the names of fishes according to the International Rules of Zoological Nomenclature, in the end, "a rose by any other name (to me) smells just as sweet".

R. E. Macdonald



Female desert ground gecko that has just lost its tail in a fight



## (II) The Bubble-eye

by A. BOARDER

**T**HE bubble-eye is a variety of goldfish first introduced to this country 7 or 8 years ago. The ones I have seen have been shaped something like a celestial goldfish but they have large bulbous bladders under their eyes. I would not describe the fish as handsome; these huge appendages give it a bizarre appearance. They are, however, a wonderful example of the art of fancy goldfish breeding on the part of the Chinese. I know of no standards made by the Federation of British Aquatic Societies for this fish and really I doubt whether it would be worth while doing so, as the bubble-eye could no doubt appear on several of the fancy goldfish varieties. The bubble-eye could then be optional on a fish shaped like a common goldfish, shubunkin or veiltail.



Photo: Fachbrook Triposuit  
A pearl-scale goldfish showing the domed scales arranged in parallel rows

I consider that these fish are very strong and fairly easy to keep, but I would not recommend them to be kept in a tank or pond where there are sharp-edged rocks. These bladders on the fish appear to be thin-skinned and to contain a colourless liquid. It is probable that if the skin was punctured the fluid would immediately escape and leave a piece of loose skin.

Although in general appearance this fish resembles a celestial the huge bladders under the eyes would soon indicate to the veriest novice that the fish were quite different from celestials. The first I saw were brought to an Olympia show by Mr. J. Horman, some years ago. I understand that they bred true and did not appear to be in

any way delicate. The usual foods were taken well. The fish were scaled and had fan tails.

### The Pearl Scale

This is another fish that has been introduced since the last World War. Mr. Reid, of Baling, first exhibited some of these at a flower show at Olympia in about 1948. These fish were of the fantail type but the scales were cup-shaped and so all stood out on the body of the fish and gave it a bumpy or corrugated look. Each scale could be seen separately and distinctly and as they shone rather more than the ordinary scale I suppose that this gave rise to the name pearl scale.

These peculiar shaped scales could appear, in my opinion, on any of the scaled types and so once again the forming of standards for this fish will be quite unnecessary. Any fish with these cup-shaped scales could be exhibited in any of the classes for fancy goldfish that were nearest to it in shape. For instance, a fantail type could be shown with fantails or a common goldfish type with that class. As any scaled fish could have this type of scale one can imagine what a difficulty there would be in making a specific standard for this variety.

### The Pom-Pom

Here we have a fish that is a veiltail with huge, over-developed nasal appendages. These nasal flaps have developed to such an extent that they look like large bobbles above the eyes or just above the nasal openings. There is no doubt that these rather strange bobbles do give a handsome look to the fish. This variety could be exhibited in a class for veiltails. Most of the shows I have visited of recent years have only one class for fancy goldfish, but some have a separate class for shubunkins, fantails and veiltails. Any of the fish that have not been given standards so far, could then be shown in the any other variety goldfish class.

The Chinese have developed many more new varieties and some of them are very attractive. Perhaps in a few years' time there will be enough in this country to warrant the making of many new standards.

## Cacti in the Fish House

**M**ANY cacti produce very attractive seed pods in fruits after they have flowered but it is necessary to pollinate them with a fine camel-hair brush to make sure of the pods setting. The genus *Mammillaria* contains three hundred species or more and many of these will give a ring of colourful seed pods after the flowering period. These pods will contain many seeds, which can be cleaned out and sown the following spring. The seeds are not ripe, however, just because the pods turn red. Before they are ready for collection the pods must have started to wither. Keep the seeds dry and away from sunshine. If it is needed to keep them for a long period it is better to let the seeds remain in the pods. They can remain viable for many years in such a condition.

# Fish up the Wall!

by P. E. PAVEY

**T**HINK they were fish tanks all over the flat; some on window sills, some on deep window sills, some on open shelves. Exasperation was gleaming wildly in my wife's eyes.

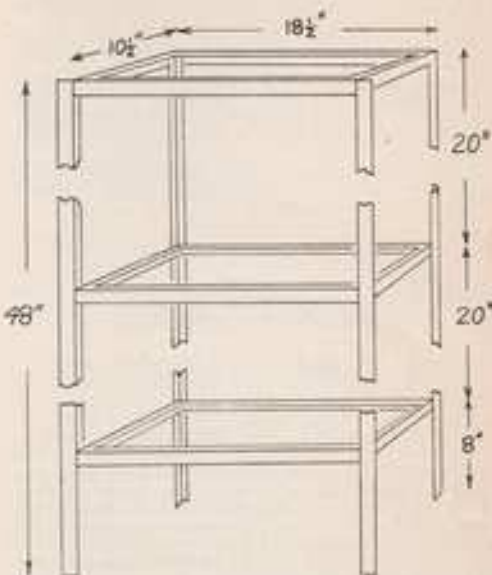
Obviously these tanks, scattered here, there and everywhere, were doing her up the wall. It would be much safer, I decided, to move the tanks up the wall—literally, and so, for a start, you being came a three-tiered stand for the 10-gallon tanks. It cost me just over £1 to make, and should your tanks be mushrooming at speed, here's how to make yourself a similar stand.

Take one of those 4 ft. 10 in. lengths of steel angle, and, with the aid of the set-square, score three lines, 18½, 10½ and 10½ inches apart. Measure ½ in. on either side of these lines and score towards the angle edge, thereby making three triangles. Now at ½ in. from either end of the shelf length score lines to form two angles. (There is no discrepancy in these measurements, as ½ in. must be allowed for the thickness of the metal. Otherwise, when the length is bent to form the shelf, there will be gaps at the corners.)

With a hacksaw cut out the three triangles and two angles. Score the ½ in. thickness of the metal at the centre point of the triangles, so that the metal will bend more easily. Fix the metal in a vice, and bend it to form a rectangle.

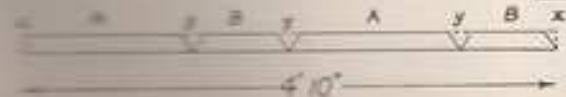
This is the first shelf finished. Make the other two in exactly the same way.

Now the stand can be assembled. Fit the top shelf first. In a pair of two vices, clamp the free ends of one of the shelves to the top end of one of the posts. It is most important to make these free ends fit together perfectly. Drill two holes, one each side of the corner, and bolt the corner to the post. Remove the vices. Clamp the other



back corner to one of the other posts, and again drill two holes, and bolt into position.

The two remaining posts will, of course, be the front ones, and the angle of these must face inwards, not outwards, or it will be impossible to fit in the fish tanks afterwards. Clamp the two remaining corners of the shelf to the front posts. Heave the stand upright. Only one hole can be drilled at the front corners, but the shelf will be



## Materials needed for a three-tiered stand (18 in. by 10 in.)

- 4: 4 ft. lengths of 1 in. by ½ in. steel angle.
- 5: 4 ft. 10 in. lengths of 1 in. by ½ in. steel angle.
- 18: 2 BA ½ in. roundhead screws.
- 18: 2 BA nuts.
- ½ pint of paint.

(The 4 ft. lengths of steel angle form the posts of the stand; the 4 ft. 10 in. lengths are formed into the three shelves.)

### Tools:

Hacksaw; vice and two hand vices; drill brace (electric, if possible); ½ in. drill; screwdriver; 2 BA spanner; ruler; set-square; scriber; spirit level.

Cuts are made in the steel angle (left) and it is then bent as shown (left, above). A, 18½ in.; B, 10½ in.; x, ½ in.; y, ½ in.

secure enough, with its four screws and nuts at the back, and two at the front. Remove the vices.

Next, measure 40 in. from the top of the stand (leaving 8 in. at the bottom), and fit the bottom shelf. If you are lucky enough to possess four vices use them now, for they will make the job of fixing the bottom and middle shelves much easier. (I managed with two, however.) At 20 in. from the top (28 in. from the bottom) fit the middle shelf.

Verify that you have made your measurements correctly by testing the shelves with a spirit level.

Tighten all the nuts with a spanner to make the stand rigid, and get out your paint brush. Coat the stand twice.

When you put your tanks upon the shelves you will find you have 10 inches of space between the tanks for hoods, and for working room.

Just one point: the steel angle, after it has been cut to your measurements, will be weighed and sold to you by its weight. Mine cost me 19s. 6d.

## Do Not Neglect the Pond in December

says ASTILBES

**D**URING this month the pondkeeper must not expect any growth among the water plants in the pond but this does not mean that the pond should be neglected. There will usually be something which needs some attention if only once a week. It is possible that the weather will remain quite open until after the turn of the year and many Decembers go by without bringing a severe and prolonged frost. All the water lily leaves should have died down by now and the other water plants will have gone to rest. If any dead leaves remain in sight these should be removed and the same applies to any leaves which may have blown into the water.

### Transplanting in Winter

It is not generally realised that it is quite possible to split up and transplant water lilies and other large growing water plants at this time of the year. This should be done only when they can be replanted immediately. The root stocks must not be allowed to dry out, but provided that the transference is only from one pond to another nearby or to a different position in the same pond, there should be no difficulty in the moving task. If most of the water is removed from the pond before any of this work is undertaken then it will be far easier to work on the plant stocks. A sharp spade will be necessary to divide the water lilies and most of the other plants that have a thick root system. It has been found that where possible it is a great advantage to plant these types in a separate container. Some old turves are as good as anything and there is no need to worry too much over using peat soils that contain fertilisers. It must be remembered that once fishes are in a pond there is always likely to be sufficient manure to encourage the growth of such specimens as water lilies. As a matter of fact it will be found that the lilies will grow too rampantly for a medium to small sized pond without extra fertilisers being necessary.

In a small pond there is always the possibility of overdoing the fertilising and so upsetting the water. In the usual garden pond there is plenty of muck and waste matter at the bottom to provide nutriment for water plants.

# Electricity and

by Dr. R. O. B. LIST

**W**ITH very few exceptions, each one of us uses electricity in some way or another, and if truth is to be told, we will acknowledge that we have suffered mishaps. This is not just the prerogative of the new-comer to the hobby. I know that I have boiled fishes, chilled them, burnt holes in various things with heaters and even shocked myself by putting my hands in a "live" tank. Can we hope to avoid some of these pitfalls?

We use heaters, thermostats, aerators and lights in shades. We should try to buy the best we can afford. And how do we know what is best? Ask your fellow hobbyists. Look for the branded make of article, in preference to the unbranded. Most manufacturers are proud of their names and reputations.

Let us consider electrical equipment in terms of watts, volts, amps and resistances. The first two of these we know automatically. Amps or amperes can be usefully termed as the rate of flow, similar to the amount of water that is drawn from a tap. Resistance is the factor limiting the flow, motivated by the pipe and tap opening. The greater the restriction, the less the flow.

### Heaters

First we will deal with the heater. In its most common form it is a spiral or resistance wire wound around a former, protected by a glass tube. The wire is so gauged that, when a current is passed through it, the resultant energy is dissipated into heat, which in turn heats the tube and then the water surrounding it. There are many forms of heaters, and the ones most commonly used are the suspended heater and the pliable base heater.

In the first the former on which the resistance wire is wound can be of clay or ceramic. It can be plain sided or grooved. I find that the ceramic tends to last longer than the clay former, possibly because of its better method of manufacture. I also find that the grooved former gives better service than the plain sided one. The reason for this is as follows. When the resistance wire is warmed by the current passing through it, the wire expands. The expansion will cause it to move, and if the former is not grooved, one spiral can touch the next spiral and cause a short. The resistance of the resistance wire is thereby decreased, and the current passing through it generally increases. The wire becomes hotter, causes scum, and will then burn out. This danger is largely removed if the wire is firmly held in its grooves. A heater will also burn out because of oxidation, but this will take time.

The pliable base heater is not to be disregarded by any means. It is costlier in the first place, but with its use results are excellent. I do, however, make one reservation. On no account should you think that you know better than the manufacturer. Follow his directions implicitly at all times, because the secret of its long life and usefulness is in the amount of heater that must be covered by compost. The directions are precise and clear.

### Thermostats

Now we turn our attention to the thermostat. I have some that have cost just a few shillings and others that run into a pound or two. Your pocket must be your guide as to price. You have a choice of submerged 'stats, external



# Fish-keeping

bars, hang-on 'stats, stick-on 'stats etc. Some have small reflectors, such as neon bulbs, to tell you when they are functioning, and others have bulbs that tell you when they are "off".

It has been mentioned to me that completely external thermostats are not to be recommended, as they are affected by outside temperature. This I do not agree with.

The thermostat is an agent to regulate the flow of heat from the heater. It will, in a few words, set the heater to work when heat is required, and switch the heater off when sufficient heat has been attained.

Ideally a good thermostat is one that just functions as it should, trouble-free, attractive and not unsightly in appearance, and costs the right amount of money. Bear in mind that a good 'stat can last you years. The emphasis is on the word "good". The apparatus can be used for just a few hundreds of fish or for a very valuable collection, running into quite a sizeable amount of cash. If you can sometimes afford to buy the best, and can safely judge what is the best, then that is the article for you.

What is the best? It should be of good manufacture. It should be easy to control. Its components should not be flimsy. And it should function. When the required degree of heat is reached, the 'stat will switch off by means of a bi-metal strip, which has a flexibility that can be manipulated by heat. Conversely, when heat is required, the bi-metal strip will contract and switch on.

There are two points on 'stats which I should bring to your notice. Some manufacturers are very proud of their product and guarantee a certain tolerance up to a given number of degrees of heat. Brand XYZ guarantees a tolerance tolerance up to 1°F, brand ABC will go up to 2°F. Why this should be anything other than a sales gimmick, I fail to see. I know of no fishes that are so sensitive to a degree or two. Do you know of any? Not in the fishes we keep, nor in Nature, where, by the way, the tolerance is very much greater than a degree or two. Why the manufacturer has to guarantee his product seems odd to me to be a little strange. No manufacturer will agree with you if he is worth his salt, whether you are covered under his guarantee or not. They value their reputation and rightly so and if a product is faulty, they will bend over backwards to correct it. Faults do occur even in our prestige manufactured articles, and in fact, it is impossible to produce faultless articles *ad infinitum*.

Many years ago I bought a reputable thermometer. I found its scale readings were 20°F out. I complained and pointed out the fault. Great consternation on the part of the maker. I not only received a new thermometer, but every year I receive a new sample of their products. This happened nearly 15 years ago and the thermometer that was replaced in the first instance is still in use to this day. So I said, manufacturers are proud of their products.

Some-bulb indicators on thermostats can show when the heat is on or some show when it is off. Personally, I prefer those that show when the heat is off. A glance at a tank with a lighted bulb will then quickly prove if things are in order. If the lighted bulb shows only when heat is on, one cannot be quite certain if sufficient heat is being put into a tank.

If you are going to use submerged 'stats, make certain that the things are really water tight. If you use external 'stats, the control lever can be knocked. Both types should be correctly set in the first instance. Outside hanging or

stick-on 'stats are very good, but a careless flick with a finger could knock the control and give either too much or too little heat.

## Aerators

With aerators we have a variety to choose from. With a diaphragm or bellows type you should be guided by a fellow hobbyist or a good manufacturer, and your choice should be related to your requirement for an aerator. As I use the term aerator, I also mean the use of such a piece of equipment for filtering and periodic suction cleaning.

Speaking from experience, I prefer the piston type of pump. There are less parts to go wrong, and apart from occasional oiling, it needs virtually no maintenance whatsoever. On oiling, just one word of warning. Use the right type of oil. One pump I have in use, apart from a very occasional switching off for oiling, has never ceased to function during the 12 years that it has been used. Spread the initial cost over this period of time, and you will find the piston type aerator a very satisfactory buy.

Do not go seeking a completely noiseless pump. I have yet to find one. Some are virtually noiseless I grant you, but after some wear, the noise will and must increase. Beware also of the over exuberant pump. There are some about and if by chance you get one, try using clamps.

## Safety

Generally, as far as electricity is concerned, don't adopt the attitude that "This cannot happen to me". It is disastrous to do so. Remember that it takes very few milliamperes to kill a human being, especially when the skin is moist, as in summer. Beware also of your damp floors, you fish house enthusiasts, when you tinker with electricity. Try and keep to rubber soled shoes for such purposes. I would not now be without them, having already suffered minor mishaps in the past.

Make your wiring neat and tidy and correctly finished off. Loop wires out of the way and avoid at all times trailing wires. Earth your tanks and stands by using clean wire to connect earth points or water pipes. Those of you who are employed in factories can safely take a tip by looking at the installation. Always make proper connections and if doing repair or maintenance work, switch off first. Your fishes will come to no harm in the meantime. Note that the term switch off means not just the convenient switch, but at the mains. Usually switches are of single-pole variety, but there is always a live wire about. A mains switch will break the circuits in both wires, and that leaves no doubt.

Do not try to get on familiar terms with electricity. Treat it with respect. By this I do not mean be afraid of it. Have you got a supply of insulating tape in your work cupboard? I expect you have some tape of sorts, but is it insulating tape? There is a vast amount of black tape, sticky on one side, on the market, sold under the name of insulating tape. Most of it is as good an insulator as a piece torn off the tail of your shirt. Buy your tape from a reputable source and see that you get a branded make. It does not require a lot of searching for. Far better, use the proper connectors that are available for the purpose of joining cables.

Never under any circumstances keep lengths of live wiring in your shades. Flexes should be outside and not in. You often even see flex dangling in water inside a shade in some aquarists' fish houses.

Consider also whether your wiring carries more current than it should. There is a limit, you know, as to what you can do. Avoid the three-way adaptors and such like appliances. Make yourself a tidy and neat switchboard. It saves a lot of trouble in the long run. Do not overload your fuses. Having got your switch panel ready, purchase a double-pole 10 amp switch-fuse. There are various

types, i.e. porcelain, bakelite or metal. The last is preferable but slightly dearer and stronger. The double-pole switch will, when switched off, break both leads. Cut your wiring so that it does not flop about, but is just the correct length.

Remember that 2 amp points will allow for not more than 200 watts, if your voltage is of the 200 to 240 volt variety. If using more than 500 watts and not more than 1,000 watts, use 3 amp points.

If you do not have neon indicator bulbs in your thermostat, you can mount a car bulb, obtainable from most garages. For 100 watt heaters, you may use 6 volt, 6 watt bulbs, or a 12 volt, 6 watt bulb. If you use a lesser wattage heater, your car bulb should be 6 volt, 3 watt or 12 volt, 3 watt. If you use more than 100 watts, use the same bulbs as for 100 watts, but your indicator light will be somewhat brighter. A simple test is as follows: if your thermometer shows higher than 75° or 78°F (24° or 26°C), whichever you

favour, and your bulb is lighted, your heater is still functioning, and consequently your 'stat will require a little adjustment. If your thermometer shows very low, and your bulb is unlighted, indicating that the heater is not functioning, then you also require a 'stat adjustment.

Aquatic dealers cannot be expected to know all there is about electrical equipment. They may or may not know all about fishes, but as far as electrical matters are concerned, they are just as much swayed by sales talk from enthusiastic salesmen as we may be. I firmly believe that a trade is a trade, and if I wanted to purchase a valuable painting, I certainly would not go to a chainstore or supermarket. I'd rather go to the man who is well versed in his trade, as he is the man you could rely on if you had to. Take my advice and consult fellow hobbyists. Make haste slowly if you can, and even if you need to be what I would call 'sloppy' in some of your interests, try not to be 'sloppy' with electricity. It may and does mean death.

## Bloodthirsty Piranhas by JACK HEMS

WITH the exception of a few species, piranhas, sometimes called freshwater cannibal fish, tiger fish, devil fish and caribes, are the most bloodthirsty and dangerous fishes known to man. They are exclusively inhabitants of many of the rivers and streams of tropical South America and, singularly enough, belong to the family Characidae (characins).

There are many different kinds of them spread over several genera. The larger species attain a length of about 20 inches; the smaller ones, which are reputed to be the most savage, average half that size.

Piranhas have deepish, compressed bodies (roughly discoid) covered with small scales on steely green to golden olive sides. The sides of some species are adorned with dusky blotches and spots. The abdomen is serrated, and is often tinted with light orange. The major fins are sometimes suffused with yellow, brown or black. The caudal fin of most species is dark in the base and along the posterior margin. The strong bulldog jaws are studded with short, sharp, wedge-shaped teeth.

Although some piranhas are said to feed mainly on vegetable matter, nearly all species have an insatiable love of flesh. While on the subject of food it may be mentioned that piranhas themselves make a valuable addition to the river Indians' diet.

Catching them, however, is fraught with danger and, in the words of Michael Swan, author of *The Marches of El Dorado* (Cape, 1958), '... hardly an Indian who lives on these rivers has not had a toe bitten off... or a piece of his head torn away'.

The method of capturing piranhas for the cooking pot is not without interest. Knowing that the fish are adept at biting their way free from ordinary tackle, the Indians lure them to floating logs baited with the entrails of birds and other small creatures. As soon as the piranhas gather round the bait, they are shot at with arrows, or pierced with spears.

Just as moths are attracted to the flame of a candle, so are piranhas attracted by violent movements or splashing in the water. Yet the fish will not always attack a swimming man or wading beast unless an oozing sore or open wound invites attention. But the moment a piranha takes a bite and draws blood, hundreds or thousands of its fellows will hurry to the feast. It is fortunate, indeed, if an attacked man or animal ever gets free. 'A case is on record', observes J. R. Norman (*A History of Fishes*, Benn, 1931), 'in which a man and his horse who fell into the water were

subsequently discovered with all the flesh neatly picked off the bones, although the man's clothes were undamaged.'

The speed with which a school of piranhas can reduce large prey to a mere framework of bones is nothing short of miraculous. In *The Amazing Amazon* (Heinemann, 1952), Willard Price tells how piranhas stripped all the flesh from a sheep in under 3 minutes. It takes a pack of these piscine wolves about the same time to devour a man.

Among certain primitive Indian tribes, piranhas play a gruesome role in the rites associated with the honoured dead. For after the mourners have paid their obeisances to the corpse, it is laid in the river for the voracious fish to pick clean. After this proceeding has been completed, the skeleton is pulled ashore, dried in the sun and dyed scarlet before being hung in its appointed resting place.

Piranhas rarely reach the tanks of tropical fish dealers, for aside from the fact that each piranha captured must be carried singly in a can, the market for such unsociable fish is strictly limited to public aquariums and keen collectors of rare species. Nevertheless their history as aquarium fish dates back more than 70 years. According to the late John Paul Arnold of Hamburg, Germany, at least one species of piranha (*Serrasalmo spilopleura*) was known to pioneer German aquarists as long ago as 1889.

The species most commonly seen in aquaria are the yellow-bellied *Serrasalmo spilopleura* (mentioned above) from the Amazon and La Plata Basins; *S. nattereri* with reddish tints from the Orinoco; and the dark-spotted *S. rhombus* from Guiana.

As a rule a solitary piranha will soon make itself at home in an aquarium maintained at a temperature range of about 72° to 78°F (22-26°C). For food it should be given *Tubifex* worms, garden worms, pieces of raw beef, offal or live or dead fish. Such things as meat maggots and woodlice can also be included in its diet.

A piranha will soon learn to come to the front of its aquarium for food. But however knowing an individual fish may become it would be most unwise to dip a hand into its container. Collectors and aquarists who have tempted Providence in this way still have the scars or a shortened finger to show as a reminder.

In America experiments have been carried out in keeping several piranhas together in one tank. In all cases bloody battles have soon occurred. Perhaps their addiction to scrapping among themselves in the restricted swimming space imposed by artificial conditions may explain why, as yet, they have not been bred in captivity.



## Half a Century Ago

by J. R. TINGLE

**F**IFTY years ago British aquarists could be counted on the hands. Shubunkins, telescopic moors, veils, orandas, lionheads, rather common to-day, were little heard of and rarely seen, only at some side show at fairs or at our large public aquariums.

Goldfish were imported from the Continent on a moderate scale and the few that managed to survive the long sea journey and arrive at the Pet Stores were sold in an ornamental water at anything from one penny to fourpence each and condemned to spend their short lives in a jam jar or small glass bowl idolized by some junior, who killed them by kindness, constantly changing the water and feeding them with an abundance of dried 'ant eggs'.

The lucky few managed to find homes in ornamental ponds or tanks and sometimes the solitary one managed to find his home in a large size pickle jar and found a stunted yet fairly happy life in solitary confinement.

I think my first vision on this earth was a fish tank. My father was a dealer in fishing tackle, and he sold live baits; he used to stock goldfish, and by my efforts at angling as I grew older, I used to bring small roach, gudgeon etc. to help in the sales and sometimes I used to bring small pike (unknown to Dad) and put them in the stock tank, which I found things up and helped to diminish his stock!

At last I was the proud possessor of a tank of my own, and with the help of an old aquarist friend I was persuaded to keep just a pair of goldfish. These were about 3 inches long. Canadian pondweed was placed in one corner with stones to give effect. Father's stock of maggots was used to supply food.

One sunny morning I noticed the fish chasing round the tank, and every time contact was made with the plants showers of eggs were strewn in all directions. I had prospects of supplying father with fish for the rest of my



The author in his fish house, which contains 20 aquaria.

life! Much to my dismay, our aquarist friend persuaded me to let most eggs go down the drain and keep the few attached to the plants in another container. After 3 days the container was crowded with small hair-like creatures clinging to the plants, and there were lots of fuzzy-looking eggs.

Our friend advised me to put the parent fish into the stock tank and to allow just one "dip" of the embryo fish to occupy my tank. Bang went the prospects of rearing thousands; in fact my tank looked quite empty. I was taught to make Infusoria by scalding a little clover hay in jam jars and adding most of the fluid to my tank. After a further 3 days I was astounded to see hundreds of small fish darting all over the tank. Keeping my Infusoria going, I was shown how to detect the microscopic animals by placing a spot of the water on a piece of glass, and holding this over a light and viewing it through the lens of a pair of



Fancy goldfish varieties bred by the author



opera glasses (no microscope was available), when thousands of small animals could be seen quite easily.

Three or 4 weeks elapsed and finnage could be seen on the little fish. Different food was needed and I was taken to visit various duck ponds until *Daphnia* and other insect life was found. On feeding this and a little grated dried liver to the fish some grew rapidly and others stood still and just faded away. At the end of my 3 months' experience, I finished with about a dozen fish with no golden colour like their parents but 1½ inches long brown little animals, but also with an experience and sense of achievement that has lasted me over 60 years.

Time went by, with two world wars, but at last I became possessor of a fish house containing 30 tanks, a small garden pond and a practical knowledge of breeding all kinds of fishes, native, tropical and fancy goldfish and an interest that will last me all my life.

At the outside of one end of the author's fish house is his garden pond



## Like Fishes or Show 'em —

You cannot do both! says J. R. HOOTON

I BELONG to that small section of the hobby called "native coldwater", and I have found that you must either like fishes or show them, for these reasons.

I hate to see so many railway men and bus men being sacked, and that means that I rely on public transport to get to any show. With the price of fares to-day I find it very expensive, but my main grouse is that I simply cannot carry 18 in. by 10 in. by 10 in. or 24 in. by 12 in. by 15 in. tanks and fishes on my own.

How many people have tried to carry *one* 18 in. by 10 in. by 10 in. and a 6 inch fish (I have tried to carry larger tanks and fishes) with the fish in a double-lined polythene bag wrapped cosy in Mum's best shopping bag, and then tried to board a London bus during the rush hour? I always find that the bus is crowded and so you have to put the tank under the stairs while you carry the fish upstairs, and when you come down you find that some bright spark has kicked one of the sides in. (I have tried umpteen methods to protect the glass and still these fools damage the tank; once I found a suit-case on top of a tank and even the conductor on one occasion was found sitting on it.)

If you are lucky to get a seat downstairs it is 10 to 1 that the cubby-hole is full and that the only seat available is right down in the front, and in the attempt to get there you hit a lady in the back with your tank and then the rest of the passengers are calling you all the names under the sun.

"Ah . . . but", you say, "some shows have their own tanks available." I know, but when carrying fishes and tanks I like to allow a lot of fresh air to the fishes, which means that I have to keep opening the bag to let the air in and that means that at the slightest jolt of the train or bus water is spilt all over the place, which could lead to a fine because it is an offence.

"Well, so what?", you are saying. "What has all that got to do with liking or showing fish? Has he not got any patience?" Yes, I think I have after I have spent an afternoon off work (losing pay) to get the fishes out of the pond.

But what I really think is killing the showing of many coldwater fishes is that at the shows where tanks are

provided they are either 18 in. by 10 in. by 10 in. or 24 in. by 12 in. by 12 in., and in these tanks you have to keep a 6 inch or larger fish (in my sphere of native coldwater) for anything from 24 to 72 hours in clear water with an 80 watt bulb switched on for the complete length of the show. Now fair's fair: native coldwater fishes aren't like those tiddlers and nasty man-made oddities called tropical fish. Native coldwater fishes, like all natural fishes, do not live in clearer than clear water and they do not have 80 watt lamps burning their eyes out; nor are they kept in such a tiny space. A 6 inch coldwater fish wants a 36 by 12 by 15 in. tank, a 12 inch roach or carp needs a 48 in. (or if possible 60 in.) by 15 by 15 in. tank. How often does the sun shine for 24 hours of the day on one spot? Also, how often does a milling mob of people stare eye to eye to a fish in its natural state? How do you think the fish feels to be carried around in a bag being bumped every 2 minutes, then placed in a clear jar and being blinded by a lamp? No wonder it goes into a mad sulky dance as the mob of idiots stare at it and bang on the glass.

I still keep fishes in the pond and they love the rich growth of green-grey water and plants (there are no plants in a show tank nor are there any roots, food, mud etc.). I like to keep my fishes in conditions that suit them and are what they like.

Gene are my show days. The public will have to sit by my pond and hope that the fishes will poke up their heads to eat a piece of apple or catch a fly. I will never enter my fishes in shows again. After all, what is the point of winning a card that is only going to be put in the waste bin afterwards? I know people who used to say to the show managers: "Just give me a blank card and save them for the new members who delight in these until they have seen; they either don't want them or grow up to be like the show-offs who like to use the cards as wall-paper and the cups as something to talk about and act big".

I, unlike the 90 per cent of show-offs in the aquarium hobby, find that I like fish and do not want to join the one-up-manship club that is trying to rule our lives.

## OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

Would ordinary window glass be strong enough to glaze a 20 in. by 22 in. by 12 in. aquarium frame?

It would not be wise to glaze a 2 ft. tank frame with ordinary window glass. Use 42 oz. heavy drawn glass or 1/2 in. polished plate. It is possible, of course, to economize in aquarium construction by using polished plate for the front of the tank, and secondhand (though not deeply scratched) plate or wired glass for the bottom, back and sides.

What are annual fishes?

Annual fishes are those species, chiefly South American, which inhabit shallow ponds and ditches that dry up once a year. But before the waters are evaporated by the heat of the sun, the doomed fishes leave their eggs in the mud. These they remain intact until the return of the rainy season, when the fry hatch out, mature quickly and, like their parents before them, spawn in the protective mud.

Is it possible to 'kill' the free lime in cement aquarium ornaments by pouring hydrochloric acid over them?

Yes, but after the fizzing has ceased, the ornaments should be left to soak in fresh water for several days before being introduced into the aquarium.

The water in my electrically heated and lighted aquarium is several degrees cooler at the bottom than it is at the top. Will this difference in the temperature adversely affect the health of the fishes?

In most aquaria there is a difference in the temperature between the bottom and top layers of water. Unless the difference is greater than 5°F (3°C), your fishes should not suffer any harm.

Why is it that some plants will not grow in the company of others?

The softness, hardness, acidity or alkalinity of the water may only suit some of the plants placed in it; that is to say, whereas some prosper best in alkaline water, others prefer it to be acid. Furthermore, some plants take up the soluble salts in the water faster than others, and thus rob them of the elements necessary to keep them alive. Where a plant is seen to be dying amidst a host of thriving companions (of different species) it often pays dividends to plant it in a small crocked pot of gritty clay or loam topped with coarse sand. Another thing to remember is that some plants can be smothered by too much light and too strong overhead light.

I have just placed a number of neon tetras in my community tank. They seem to fight a lot among themselves. Will they molest my other fishes?

Neon tetras are playful but not pugnacious, and their usual sparring about with one another never seems to result in any damage being done. All in all, neon tetras make ideal occupants for the community tank.

Recently I bought some black-headed sunfish. The dealer told me they were easy to keep. Nevertheless, since introducing them into a 20-gallon aquarium containing clear water maintained at a temperature of about 75°F (24°C) they have refused all the different brands of dried food I have offered them, and dart nervously to the back of the tank at my approach. What should I do to better them?

The black-headed sunfish is easy enough to keep if you give it acid water, combined with a temperature range of from 70° to 75°F (21-24°C). Newly purchased specimens are rather shy to begin with, but plenty of plant life in their aquarium helps to give them confidence and breaks down their initial reserve. They need live food such as *Daphnia* and live worms. Some specimens will accept scraped meat.

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of fish-keeping being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

What sort of conditions and foods suit gobies best?

Generally speaking, the tropical gobies prefer rather shallow, well oxygenated water, some retiring places among rockwork or large pebbles, and a temperature in the lower to middle seventies (°F) (21-24°C). All are carnivorous, with a liking for tiny worms and *Daphnia*. Dried foods are often ignored.

Given good conditions and adequate nourishing food, how many years should the average livebearer stay alive?

Normally, the average livebearer has a life span of 2 to 2½ years. Perhaps the reason why so many livebearers die before their time is because constant high temperatures over-excite the males and put a great strain on the habitually gravid females by shortening the intervals between broods.

A number of tropical fishes do better in salty water, yet it is said that salt is inimical to the health of aquatic plants. Therefore, how can the aquarist keep salt-loving fishes such as mollies and fresh water plants in perfect conditions in the same aquarium?

The amount of salt (about one teaspoonful to each gallon) needed in an aquarium to make it more comfortable for certain brackish water fishes is so small that it does no harm to the plants. It is when the aquarist continues to add salt every now and then that trouble begins. In other words, once sufficient salt has been introduced into the aquarium, it is unwise to add any more.

If I dose my aquarium with a solution of potassium permanganate to get rid of free-swimming algae, will it leave a permanent stain on the plants?

The muddy deposit left behind after the water has cleared can be knocked off the plants and removed with a siphon tube. By the way, while the water is clearing it is advisable to provide the fish with artificial aeration.

When should the aquarist remove parent cichlids from their free-swimming young?

If the parent fish have permitted the fry to reach the free-swimming stage without molesting them, then it is reasonable to suppose that they will not behave badly toward them in the near future. But as soon as the one or the other of the parent fish is seen to adopt an aggressive attitude to any of the fry, then the time has come to remove them to another tank.

Just over a week ago I bought four veliferia mollies and placed them in a well-planted 12 gallon tank filled with ordinary tap water. Yesterday I noticed that three of them stay in one spot in midwater and shake their bodies from side to side. They snatch at food if it is dropped immediately in front of them, but seem incapable of swimming for it. What is wrong?

Your mollies are probably suffering from the effects of a chill, perhaps contracted on the journey home. Your best plan is to lower the depth of the water to within 4 in. or so of the compost and maintain a steady temperature of at least 75°F (24°C). Further, the addition of one teaspoonful of sea salt to every gallon of water in the tank may help to bring speedy relief.

Why do writers in aquarium subjects stress the importance of an even temperature in our tanks when in the wild the sunlit



top layers of the water are often several degrees warmer than the middle and/or lower levels?

It seems that domesticated fishes are less tough than their relatives in the wild, which instinctively frequent the water having a temperature most suited to them. You must also bear in mind that an aquarium cools or overheats faster than water does in a river or pond. In general, once domesticated fishes have become accustomed to a limited range of temperature, it is a risky business subjecting them to any change unless it is brought about slowly over a period of a week or two. Nevertheless, experience has shown that fishes which have become used to a rise and fall of several degrees in the temperature in every 24 hours usually live longer and remain healthier than those species maintained in less variable conditions.

I should like to breed the Australian rainbow fish (*Melanotaenia maculata*). What size tank is best suited to spawning, its set up and temperature, and the most satisfactory food to bring the adults into mating condition?

You should give your fish plenty of swimming space in a brightly lighted tank measuring at least 24 in. by 12 in. by 12 in. It should be filled with water of an alkaline rather than acid nature and contain dense thickets of bushy foliaged vegetation. The temperature should average 73°F (24°C). Among the most satisfactory foods for bringing the fish into spawning condition are chopped earthworms, large *Daphnia* and *Bemax*.

I have been given a glass tank that holds about 7 gallons of water, but as I have not kept fishes before I cannot make up my mind whether to stock it with tropicals or goldfish.

You would be well advised to keep tropicals. For one thing, your tank is not large enough to support more than two small goldfish, which to increase in size and remain in good health need lots of swimming space combined with plenty of oxygen. For another thing, a small tank housing a few gaily coloured tropicals is easy to keep clean and superbly attractive at all seasons of the year, which is more than can be said of a similar sized tank housing goldfish.

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

As a novice fishkeeper I have both coldwater and tropical fishes. My goldfish are quite happy at 66°F (19°C), and my tropicals are at 74°F (23°C). Is the 8°F difference significant or could my coldwater fish be perfectly happy with the mixed tropicals?

If the goldfish are of a fancy variety such as veiltail or crania then they would be quite happy with the tropicals. In the summer months my garden pond often has a temperature of 80°F (27°C), and the fantails do not mind this at all. Thousands of fancy goldfish are bred under tropical conditions and in fact all types of goldfish appreciate warm water when young. The rate of growth of youngsters in warm water bears no resemblance to that of fish kept in cold water. The only trouble likely to occur is that when the water is warm it contains less oxygen and so the fishes must not be overcrowded. It would also not do to put large goldfish in with very small tropicals, as although they may not eat the small fishes they would eat much of the food given and the tropicals could be starved. If you do place goldfish in with the tropicals do it during the hottest part of the day when the temperature of the goldfish tank is at its highest; the change will then not be enough to worry the fish.

I wish to know which metals I should not use in my pond. I am fitting a fountain and know that I should not use copper but am not sure about brass.

Brass is also dangerous in the pond as it is made from a mixture of copper and zinc. Some forms of brass, such as used for cocks etc., have as much as 80 per cent of copper and 20 per cent of zinc. No brass of any kind is safe in the pond. Aluminium does not appear to be dangerous and of course plastic fittings are quite safe.

I have the age-old problem of cloudy water in my pond. If the fish dive down 6 inches they cannot be seen. The pond is in the sunshine and gets no shade other than from a few water plants growing there. Is there anything I can do to improve matters?

You appear to be aware of the cause of the trouble. It is that the sunshine encourages the formation of green algae. This is a natural happening but the water usually clears once the lily leaves shade out part of the surface. However, there are a few things that could influence the clouding of the water. I have noticed that if there is a leak in the pond that necessitates continual topping up with fresh water this greatly encourages the formation of fresh green algae. The point is that if the water is left unchanged it appears to mature and the algae die out. If on the other hand fresh

water is added this gives a fillip to the algae and cloudiness once more happens. If the surface of the pond can be shaded and no fresh water added for a time it is probable that the water will clear. The overfeeding of the fishes with dried foods will also tend to encourage the formation of algae. If a covering of duckweed is given to the pond this will do a lot to clear the water. Goldfish will eat some of this weed but a good quantity will give plenty of shade to get the water back to normal.

Does the advice given in *The Aquarist* about hatching eggs of the least gourami also apply to eggs and fry of goldfish?

The advice given was to the effect that the water need not be very deep for the eggs to hatch (9 inches is ample) and that the film on the surface of the water should be removed by drawing a sheet of paper across the top of the water each day. The need for doing so for the gouramis is that they are surface breathers, being able to take in gulps of air from the atmosphere. Therefore it is important to keep the surface clean. Although the need is not the same for the goldfish fry they like a well oxygenated water and the film on the surface could interfere with the ready exchange of gases between the water and the air.

I have installed a plastic pond in my garden and stocked it with plants for about 2 months. The first time I set it up the water went like mud. I emptied it and cleared out the dirt spilled when the crates of plants were put in. The next time I re-set the plants and refilled and now the water is rather brownish-green. I put in 18 goldfish, 2 inches long, and they spend their time at the top of the water, mouthless or sucking air in. I set the plants in crates with turf, good meadow loam and some cow dung in the crates for the water lilies. In spite of changing the water I cannot keep it clear and I do not think the fish will live.

You have concentrated on making a water garden for plants instead of considering the needs of the fish. The material used for planting will undoubtedly produce some fine water plants but it will also produce a fine crop of bacteria and Infusoria. You could not have made a better start if you had wanted to make a *Daphnia* pond. The fish, however, must have plenty of oxygen and the fact that they have been at the surface mouthing for air means that the water is deficient in this essential gas. I do not believe in giving plants a rich medium as one of the most important uses for them is to take up much of the foul matter in the pond, including the droppings of the fish. Once a pond gets established the plants will help to keep the water clear by using up the waste matter but if they have been liberally

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## our readers

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



# write

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

### Aquarium Shows

There have been a number of large-scale aquarium shows in the South of England, the most prominent being the annual National Aquarist Exhibitions organised by the National Aquarist Society. One thousand exhibits were mounted and any aquarium fish or plant could be seen in its element.

While this type of show was and still is desired by the general public interest steadily waned and the deficit to the Society in the last three shows amounted to £800. The Society, severely hit as a consequence, was compelled to discontinue the shows and sell all its tanks, staging, and other equipment.

For the first three shows, tanks and staging were hired, but this proved to be uneconomical, the Society had to buy them. Over the last three shows cost £280 to mount (excluding advertising). Rent of a central London hall for one week and payment to several contractors accounted for £300. Last year over 20 stallings in all, whereas the income from these shows was just about just the cost of trophies and prizes for the exhibitors. Other sources of revenue were newspaper advertisements, traders' stand rents and money in the door. None of these proved adequate.

Another serious London event to which we used to look forward was the Guppy Show aquarium section. This being organised on a scale it was finally liquidated, being considered to be too great a financial burden. And now the Guppy Show itself is declared to depend upon sponsorship by sponsors if it is to continue. This is highly unusual, bearing in mind the much greater interest in and support for the bird-keeping hobby.

Some of the current southern open shows are part of events organised by Borough or County Councils with obvious financial liability for the clubs involved. Large-scale shows organised directly by aquarium clubs are becoming few in number and among these the Portsmouth show is considered to owe much of its success to the club occupying it—the local Community Centre Hall for one week at a weekend end.

There is an analogy between the British Aquarist Society and other similar events. Belle Vue is unique in the fact that it is an private and visitors to the Zoo are on the premises of the aquarium show. Though (I believe) the financial position of the southern aquarist Federation in the future are very limited it is said to have difficulties in 1967.

In considering the possibility of a big open Show in the South, we have considered something similar to the old "National" show, which might now cost £1,000 to stage,

and for which little public support could be expected. Enquiries indicate that the trade is not interested in sponsoring such a show and there is no longer available a central store of tanks and equipment.

If a sufficient number of clubs could agree to co-operate they might have the resources to meet the costs of such a show, and these could be modified considerably if the exhibitors were as prepared as are those in the north to provide their own tanks, staging, equipment etc. If outer London is acceptable as a venue, hall rent could be reduced considerably. A succession of events in the north, south, east and western suburbs might enable more clubs to participate and so spread the load.

These ideas have been ventilated among member clubs of the Federation of British Aquatic Societies and if the response has not been enthusiastic it is because of the formidable problem of finance and the knowledge that a loss might have to be risked if the exhibitors are themselves unprepared to meet the actual cost of their desire to compete. There may well be better propositions and these we would like to hear.

In the meantime I suggest that show reports might include details of how the show was organised, how it was financed, what advertising was employed, how many exhibitors and traders supported, what profit or loss was made etc. Talent has been revealed in all these respects and the lessons to be derived from particular experiences would be valuable to the hobby as a whole.

The National Aquarist Society deserves thanks both for allowing me to quote from its accounts and for an example.

FRANK STONE,

Chairman, Federation of British Aquatic Societies,  
London, N.W.3.

### Unusual Scavengers

ABOUT 6 months ago, one of the members arrived at our club with a jar of elvers, which had been taken from a Thames Lock near Oxford. They had been kept about a month at one of the Universities for observation, and were about 2 inches long, a little thicker than a pencil lead and estimated to be about 1 year old. After a sweepstake on the number in the jar had been held, they were shared out among the members (no small task without a net). Some very weird and wonderful containers were brought into use to convey them home, too, including one mineral bottle.

One of my six I placed in a saline tank containing Malayan angels and scats, but it did not survive the night. The remainder were placed in a small tank with sand on the

bottom, and fed with *Tubifex* and grindal worm. The most I saw of them was an occasional head just above the sand. I become rather tired of people asking what the tank was for, and, having a better use for it, I decided to transfer them to a furnished 24 in. by 12 by 12 in. containing six banded sunfish and six pygmy sunfish with a maximum temperature of 62°F (17°C). This turned out to be easier said than done. Has anyone ever tried netting a kuhl leach which could dig like a mole? Finally I ended up with four of the five; by this time the water was too cloudy with sand to find the last one.

With the water clear again next day, I ran a planting stick through the sand, but could find no trace of the last one. The four were placed in the tank and immediately burrowed under the rocks, pushing the sand out. I saw no more of them for a few days, but in the meantime the missing one was observed, and with some stealth and a lot of luck it was finally netted and it joined the others. Gradually they became less timid, and were often seen in the front of the tank, searching for *Tubifex*. This is now my cleanest tank for left-over worms, for they seem to find every one.

To date the largest is now about 9 inches long, and almost half an inch in thickness, the remainder not far behind. So far there has been no friction in the tank, for often the eels and all the sunfish can be seen feeding together. They have also so far been kind to the plants, with almost no uprooting, even to hair grass. What intrigues me is the way the largest can go down its burrow head first, reverse under the rock and come half way out again in a second or two. Particularly as the rock is so near the side of the tank. Standing half out of the burrow seems to be a favourite position too, possibly because it is then able to reverse down it so quickly in the event of danger. Most of them seem to "root" for the night in the leaves of giant sagittaria, drooped across them. It is amusing to watch one go for *Tubifex*, for it takes a bite then rolls round and round a number of times in its effort to break the worm off. This successfully completed, it glides away to the back of the tank to eat it.

So far it has proved a very interesting experiment in many ways, but, shortly I am going to be faced with two big headaches. If they continue at the present rate of growth, a larger tank will be required to house them, and, short of dismantling the tank completely, how am I going to net them out and keep them in the net long enough to transfer them? Secondly what kind of large container am I going to keep them in? A friend casually asked how big they would be before they started to climb out of the tank to migrate. I can imagine my wife going down to collect the post one morning and discovering an eel or two gliding round the hall floor. What suggestions please?

L. A. TRENT,  
Didcot, Berks.

#### Rocks and Rock Pools

OUT it comes again—I mean that old fallacy that limestones are unsuitable in aquaria. You have been kind enough to publish, on more than one occasion, my comments on this point, but may I, for the sake of accuracy, seek your indulgence once again?

"J.H." (*Rockwork*, *The Aquarist*, October) may be interested to know that, until my recent illness, I maintained a tank in which limestone, calcite crystals and dripstone (calcite) formed the decoration and that, after some 25 months, during which time no changes of water took place apart from topping up to counter loss through evaporation, no alteration in pH or hardness occurred that was to be measured by any means readily available to the average aquarist.

One could continue with accounts of examinations under both natural and artificial conditions but, on this particular subject, I would like to give the following observations:

"J.H." is quite correct when he states that Westmorland and Somerset stone are suitable for aquaria; at the same time it should be understood that the rocks sold under these trade names are invariably limestones (these two counties being practically composed of such rock).

"Sandstones" are often of a limy aspect and many southern aquarists use pieces of "Greensand" (usually red, to confuse the novice!), as it lends itself to fabrication to a 'water-worn' appearance.

I have found that some confusion exists about flints and it will be found that these are not usually of an interesting nature—being black or grey and sometimes with a brownish patina, and water-worn flints are invariably rounded or ovoid. The most interesting shapes are of those specimens taken direct from the chalk and these should be scrubbed and boiled before being used in aquaria.

"Craggy lumps of slate" usually exhibit the particular characteristic of slates, thus presenting a surface of edges, points and crevices against which "J.H." warns us. Water-worn slate can be most attractive, of course.

Aquarists using rock purchased under such names as Devon Black, Cheddar, Somerset, Westmorland, Derby, Cheshire etc. can rest assured that they are purchasing limestones and that these rocks have been used continually in tanks and are perfectly suitable. Any soft rock may break down in a tank and cause troubles, not only from their calcareous nature but through other toxic media.

While on the subject of criticism (and I know I lay myself open to more than enough!) may I be permitted to mention one or two points made by Harry Tegner in his "Rock Pool Exploration" (*The Aquarist*, August), for although I find aspects to commend there are others which provide cause for argument.

Not all the crab "family" are great fighters, and the term family is a misnomer in this case as the Brachyura or true crabs form a sub-order (there are a number of other groups also termed crabs, perhaps incorrectly) and the lately small family Portunidae (swimming crabs) includes the species mentioned by Mr. Tegner, *Carcinus maenas* L. However, this point is for purists. My main subject here is that while it is true that this animal, the common or green shore crab, does adopt a typical attack-in-defence attitude when disturbed and brought to bay yet it is not so ready to attack as is *Porosus puber* L., the velvet swimming crab. This latter is fiercely willing to engage in combat and its habit of dancing (as if with rage) while perched high upon its walking legs and with upraised claws widely upraised has been the cause of its being termed "le crab enrage". I note that Philip Street confirms this view (*Between the Tides*; Hamilton, 1956). *P. puber* can be distinguished from *C. maenas*, although their superficial appearance is very similar, by the blue joints and lines on the legs, by the shell being covered by a very fine pile of hair and by the last segment of the 'back' legs being flattened and rounded. Collectors will find that controlling a velvet swimming crab is more difficult and dangerous (an adult can draw blood) than engaging with a common shore crab!

With an interest in archaeology as well as in marine biology, I should be interested to know Mr. Tegner's references in connection with the source of purple dye. I have always understood that the ancients obtained their supplies of this dye from the common dog-whelk (*Nucella lapillus* L.). Behind the head of this animal is a sac containing a milky white fluid which, when exposed to the atmosphere, passes through a number of colour changes ending in purple, a fact that appears to have been well known to the Phoenicians and great piles of shells and a number of stone "extracting rubs" have been recorded along the coast near Tyre. If there is evidence that the Romans extracted a dye from *Echinus aspidarius* L. I would like to learn something of the process.

Incidentally, there are several species of "winkle", of



which the rough winkle (*Littorina saxatilis* L.) is a very like the white (*L. litorea* L.). However, the former species has its young alive, complete with shell, and thus collectors of shells for tea may occasionally find one that is remarkable.

I have seen a great variety of gastropods collected as "winkles", including specimens of the common dog-whelk, but as all the small life of our shores has served as food at one time or another such minor points need not concern us; the important thing is to enjoy one's exploration of the rock pools.

H. J. VOISER,  
London, S.W.16.

#### Stones for Aquaria

MY apologies to Mr. Vosper (*The Aquarist*, September). The word quartz should read "spar". I was referring to the white marble-like rock used in rockery gardens; obviously quartz and sand are the same, be it rock or gravel. Mr. Vosper may be better acquainted with limestone than myself, and lime content may differ throughout the country. In my experience, it is best to avoid any stone or rocks containing lime for use in aquaria.

J. R. TINGLE,  
Sheffield, 3.

#### Tank Pollution by Tubifex

I AM writing in defence of the shop accused of selling polluted *Tubifex* (*The Aquarist*, August). I have bought weekly 14 portions of *Tubifex* ever since the present owners took the shop over, and these have always been wrapped in paper. I have never lost a fish through using them. My prize possessions, three discus, are as healthy as any of my other fishes. I keep my *Tubifex* after buying it in a gallon polythene jar, and what's left of it after a week is still healthy.

Mr. Wilson does not state in his letter how much of the *Tubifex* he bought was put in his tank.

I once tried an experiment to keep *Tubifex* in a tank 18 in. by 10 in. by 10 in. by aerating with a diffuser block. This is all right until you turn off at night; then you get the smell and pollution no matter how clean the worms are, because *Tubifex* need a lot of oxygen and clean running water.

I imagine that Mr. Wilson's wife put the entire portion of *Tubifex* into his tank, and without the pump and filter in operation, the trouble which cost Mr. Wilson seven dead fishes was the result of this.

W. WATSON,  
London, S.E.17.

#### Breeding *Exodon paradoxus*

WITH regard to *Exodon paradoxus*, mentioned by Mr. L. Lewis (*The Aquarist*, August), I cannot understand Mr. H. Axelrod's statement that these fish have not been bred. According to him, they have been bred by Miss Martha Tarwater of Tampa, Florida, who was, incidentally, at the age of 10, able to sex 4-week-old Betta. This was reported in *Tropical Fish Hobbyist*, U.S.A. (April, 1962).

F. DENNY,  
Goole, Yorks.

#### Fahrenheit and Centigrade

IN "Our Readers Write" in *The Aquarist* for October, Miss Trevaldwin appears to have missed the point of my preference for the Fahrenheit thermometer to the centigrade type. It is not that I cannot cope with the centigrade. I should be able to as I made my first one nearly 80 years ago in the chemistry laboratory at school. At ten, we had schools when I was a boy, and very good

ones too). My objection to using the centigrade type is that it is much less efficient for precision work, having only 100° between freezing point and boiling point whereas the Fahrenheit type has 180°. One might as well prefer to weigh half an ounce on a household spring scales to using a chemical balance.

A. BOAZES,  
Ruislip, Middlesex.

## Coldwater Fish-keeping Queries

Continued from page 176

fed they have no need to do any work. The farmer who needs his cats to catch rats and mice does not overfeed the cats. You should remove the fish for a time and there is no doubt that once the water plants are growing well the water will gradually become safer for the fish. Try introducing some *Daphnia* once you have removed the fish. They will soon clear up any *Infusoria* and then when the fish are returned to the pond they can eat the *Daphnia* and the pond should then be safe.



Photo: I. E. PERKINS  
Water fleas (*Daphnia*) are useful in cloudy ponds for water clearing.

Recently a fisherman friend brought me a live barbel about 8 inches long. Can you tell me if this will live with goldfish etc. or will it become dangerous to them?

The barbel can grow to about 20 pounds in weight in this country although on the Continent it occasionally grows to 40 pounds. It can therefore grow too large for your tank. These fish feed mainly on worms, crustaceans and insect larvae, but a large one might eat small fish.

During the past year my five tanks have been inhabited by thousands of white larvae, which cover the surfaces of the tanks. There is also another thing in the water like a miniature baroque balloon. What are they and what can I do to get rid of them?

The creatures on the surface of the water are planarians and those in the water are *Cyclops*. I suspect that the water is rather foul and that plants have been introduced from the wild. You will have to remove the tanks and treat the tanks with a tablespoonful of household ammonia to each gallon of water. After this wash out the tanks and set up fresh. Do not over-feed as this can encourage the unwanted creatures to multiply. Many fishes would eat the *Cyclops* if they were hungry.





## 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 results of the **Peasewick and Dury A.S.** open table show were as follows: Guppies: 1, W. Holland (Colts); 2, G. Davies (Salford); 3, J. Jennings (P. & B.); 4, A. G. V. Llewellyn; 5, E. E. Ingham (Accrington); 6, F. Bolton (Lanc. Breeders); 7, K. Ingham (Colts); 1, J. A. Hill (Lanc. Breeders); 2, M. Smith (Accrington); 3, W. H. Smith (Scarf); 4, J. Hodgers (Accrington); 5, Mr. Richardson (Lanc. Breeders); 6, L. Williams (P. & B.); 7, F. Williams (Salford); 8, J. Hodgers (Bucks); 9, W. H. Smith; 10, J. A. Hill; 11, A. Wardle (P. & B.); 12, J. A. Hill; 13, J. Hodgers; 14, Mr. Tavernall (Accrington); 15, A. G. V. Tropical; 16, J. Hodgers; 17, K. Ingham; 18, Mr. Gregory (Lanc. Breeders); 19, C. Adams; 20, A. A. Howard (Accrington); 21, J. Hodgers (Lanc. Breeders); 22, F. Bolton; 23, S. W. Holland; 24, J. Hodgers; 25, J. P. Williams; 26, T. Bolton; 27, M. Smith and J. P. Williams (tie); Best Fish in Show: J. Hodgers (Accrington); Best Livebearer: K. Ingham (Accrington); Best Egg-layer: J. Hodgers (Accrington). The Shield for the Society with most points was won by Accrington.

THE fifth Meeting of the Season of the **Dunfermline Aquarists' Society** was held recently when the Perth-Dunfermline Inter-Club Meeting took place. A total of 32 Members were present and the Table-show classes and results were as follows: Platies: 1 and 2, P. N. Greening (D); 3, A. Bert (P); 4, A. S. Ashman (in Business); Fishes: 1, H. Baskie (P); 2, P. N. Greening (D); 3, Mrs. J. Kerr (D); 4, Bessie-Lovebearers; 5, A. Robertson (D); 6, W. Cookburn (D); 7, H. Baskie (P); 8, Bessie-Lovebearers; 9, H. Baskie (P); 10, P. N. Greening (D); 11, A. Robertson (D); 12, Bessie-Lovebearers; 13, H. Baskie (P); 14, P. N. Greening (D); 15, H. Baskie (P). The result was a win for Dunfermline with 26 points to 19.

THE 10th Annual Show of the **Scottish Aquarists' Society** was held recently, and was well attended. The results of the show were as follows: The Murray Shield (Best Fish in Show), A. Watt (Kilning Gossard); The Prince McNish Trophy (Best Tropical Fish in Show), A. Watt (Kilning Gossard); The Robin Kerr Trophy (The Best Coldwater Fish in Show), K. L. Brown (Metallic Oranda) (Shabazz); S.A.S. Breeders Trophy—A. Watt (Chocoma Fountains); S.A.S. Inter-Club Trophy (Club Furnished Tank), L. L. Agnew (Club); S.A.S. Furnished Aquarium Trophy (Members Furnished Tank), A. T. M. Robertson; The Savers Cup (Best Schools exhibit), Cranhill Secondary School, Glasgow; Strachan Kerr Trophy (Junior Coldwater Furnished Tank), J. S. Young; The Lang Trophy (Junior Tropical Furnished Tank), B. J. Reid; The Water Lily Cup (Best Fish shown by a Junior), Jenny by J. S. Young and G. Reid; The President's Prize, J. Moore (Best Common Goldfish); Common Goldfish and Comet Goldfish: 1 and 2, J. Moore; 3, F. Down; 4, J. Moore; 5, R. Pollock; 6, A. Young; Fancy Goldfish: 1 and 2, K. L. Brown; 3, W. Pollock; A.O.S. Coldwater Fish: 1, 2 and 3, Cranhill Secondary School; Pair of Guppies:

1, Lath Aquarists Club; 2 and 3, Lanarkshire Aquarists Club; Pair of Swordtails or Platies: 1 and 2, Lanarkshire A.S.; 3, Kirkcaldy and Dist. A.S.; Pair of Mollies: 1, A. Watt; 2, W. J. Gray; 3, Lanarkshire A.S.; Pair of A.O.S. Livebearers: 1, Lanarkshire A.S.; Single entries: Pair of Danos, Tropical Minnows, or Rainbows: 1, Lanarkshire A.S.; 2, Kirkcaldy and Dist. A.S.; 3, G. Reid; Pair of Bantling Tooth Carps: 1, A. Watt; 2 and 3, Silver Lanarkshire A.S.; Pair of Characins: 1, Kirkcaldy and Dist. A.S.; 2, Lanarkshire A.S.; 3, A. Watt; Pair of Barbs: 1, A. M. Patrick; 2, Lanarkshire A.S.; 3, Kirkcaldy and Dist. A.S.; Pair of Livebearing Fish: 1, A. Watt; 2, Lanarkshire A.S.; 3, Lath A.S.; Pair of Dwarf Goldfish: 1, Lath A.S.; 2, Lanarkshire A.S.; Large Goldfish: 1, A. Watt; 2 and 3, Kirkcaldy and Dist. A.S.; Tropical Goldfish: 1, A. Watt; 2, Kirkcaldy and Dist. A.S.; 3, Lanarkshire A.S.; A.O.S. Tropical Adult, Size 2 1/2 in. or less: 1, N. McKinnon; A.O.S. Tropical adult size over 2 1/2 in.: 1 and 2, A. M. Patrick; 3, Lanarkshire A.S.; Breeders (Livebearers): 1, S. Naiman; 2, Lath A.S.; 3, Kirkcaldy and Dist. A.S.; Breeders (Egg-layers): 1 and 2, A. Watt; 3, H. Macdonald; Furnished Tank—Coldwater: 1, S. Young; Furnished Tank—Tropical: 1, A. T. M. Robertson; 2, K. L. Brown; 3, S. Mack; Junior Furnished Tank—Coldwater: 1 and 2, J. S. Young; Junior Furnished Tank—Tropical: 1, R. J. Reid; 2, D. Cameron; 3, Cranhill Secondary School A. Club; Class 26, Schools Furnished Tank: 1, Cranhill Secondary School (Tropical); 2, Allen Glen's School (Coldwater); 3, Allen Glen's School (Tropical); Clubs Furnished Tank—Tropical: 1, Lath A.S.; 2, Lanarkshire A.S.; Marine Aquarists: 1, A. M. Patrick (Marine Tropical Tank); Any Variety Aquarists or Amateurs: 1, A. M. Patrick; 2, Lath A.S.; 3, Allen Glen's School.

AT the late Inter-Club Show with Gosh, **Thurso A.S.** won the water victories by 113 points to 54 points. At the Annual General Meeting all the officials were re-elected: Chairman, Mr. G. Lowe; Secretary, Mr. D. Wolfe; 10, King Edward Green; Treasurer, Doncaster; Treasurer, Mr. M. Harrison; Committee, Mr. D. Macdon, Mr. S. Sanders, Mr. G. Swearing.

The result of the Table Show for Egg-Laying Tooth Carps was: 1, Mr. D. Macdon (London Parachute); 2, Mr. G. Swearing (Aph. Cal.); 3, Mr. D. Wolfe (London Parachute).

THE list of Officers elected at the recent annual general meeting of the **Chelms A.S.** is as follows: Chairman, Mr. H. Arthur; Vice-Chairman, Mr. E. Pennon; Secretary, Mrs. E. Tucker; Treasurer, Mrs. F. Sore; Social Secretary, Mr. J. Tully; Show Secretary, Mr. D. Arnold; Librarian, Mrs. C. Gosh; A.S.I. A.S., F.R.A.S. Delegate, D. Turner; Two Ordinary Members, Mr. J. Merrick, Mr. T. Kelly.

AT the Annual General Meeting of the **Honford A.S.** the new committee was elected

as follows: Chairman, Mr. S. Dyer; Treasurer, Mr. H. C. Heath, 136, Mowbray Road, Romford; Secretary, Mrs. K. Heath; Other members, Mr. P. Segratt, Mr. A. T. Smith. After the business was finished Mr. A. Smith gave a short talk on Hawaiian Mosquitoes. At the next meeting, the new committee presents the Club with a complete and detailed programme for the next six months including a possible visit to Hamburg Aquarists. It was also announced at this meeting that the Daguergram Town Show for 1963 will be held on Saturday and Sunday, 6-7th July.

AT the recent Open Table Show held by the **York (Bradford)** section of the F.G.A. there were 41 entries and the results were as follows: Veiled Class, 1, Mr. V. Partridge, 785 points (Silver Star); 2, Master A. Lawrence, 751 points; 3, Mr. Hardy, 73 points. A.O.V. Col. Males: 1 and 2, Master A. Lawrence, 75 and 70 points (Silver Star); 3, Mr. P. Hordwood, 682 points; Doves Class: 1 and 2, Mr. V. Partridge, 781 and 758 points; 3, Master Robert 705 points; American Female: 1, Mr. R. Hordwood, 741 points; 2, Mr. Partridge 736 points; 3, Mr. Hordwood, 691 points; Parrot Class: 1, Mr. V. Partridge 75 points (Silver Star); 2 and 3, Master A. Lawrence, 77 and 65 points; Hatched Parrot: 1, Mr. Bates 761 (Silver Star); 2 and 3, Mr. V. Partridge 767 and 751 points; Breeders Class: 1, Mr. Bates 79, Silver Star (Best fish in show); 2, Mr. Partridge 741 points; 3, Master A. Lawrence, 701 points. During the afternoon, much interest was shown in the large and fine show in which Mr. A. Abraham displayed his full house, and well known "guppy" personalities were shown.

RECENT activities of the **Stroud and District A.S.** have included a very interesting talk by Mr. Emory of Bath on judging of Coldwater fish. During the talk, Mr. Emory used his daughter to judge a coldwater table show, which consisted of three classes: 1. Shubunkins, the results being 1 and 2, W. G. Gray; Goldfish: 1, F. Dancy; 2, J. Griffiths; 3, G. Dancy; A.O.V.: 1, L. Griffiths; Best Show: W. G. Gray; Shubunkins. At the recent "Tropical Show" the club gained second place in the inter-club Furnished Aquaria. Mr. T. Arma won first and a special, Mr. W. G. Gray a second and third and V. H. G. Mr. R. Jones and Mrs. Y. Loidley also entered fish. 2, Goldfish with a Comet took second place in its class. 1, Arma first Goldfish; H.C. Goldfish at the British Aquarists Show. An inter-club open table show was held with the Chelmsford Aquarists Society, Chelmsford winning the title by 26 to 23 points. The table show results: Barbs: 1 and 2, Mr. B. Haver; 3, Mr. E. Sturgess; Livebearers: 1, Mr. T. Arma; 2, Mr. W. Gray; 3, Mr. B. Jones; Goldfish: 1, 2 and 3, W. G. Gray; Livebearing: 1, Mr. Eustace; 2 and 3, Mr. L. Griffiths; Characins: 1 and 2, R. Jones; 3, R. Jones; Catfish: 1, B. Jones; 2, R. Jones; 3, Mr. Sore; A.O.V.: 1 and 2, F. Dancy; 3, Mr. Eustace.

The annual Dinner has been arranged for 19th January at the Rose Inn, Pagham, Stroud. Old and new members are invited to contact Mr. W. G. Gray, 17 John Dashiell Way, Chelmsford, Essex.

THE Annual General Meeting of the **Chingford and District A.S.** was held recently and the meeting was well attended.

Mr. L. Roberts, one of the founder members was given Honorary Membership for life in recognition of his long and active part in the Society's affairs and Mr. E. W. Barber continued in office as President. The previous Chairman Mr. L. Roberts was re-elected to office and a new secretary was appointed to succeed Mr. H. Somner who has done a worthy job in this capacity for a number of years. The new Secretary is Mr. D. Knight of 17, Clarendon

President. The Show Secretary Mr. G. Williams and the Treasurer Mr. M. Bell were also present.

The Society shield awarded to the member scoring the highest number of points at Table Show during the year was won for the second year in succession by Mr. J. Bartlett and the Challenge Cup Trophy awarded to the member scoring the best furnished Aquarium at the Challenge Day Show was presented to Mrs. M. Bell. Any prospective members of persons interested in the hobby of fish-keeping are invited to contact the Secretary for further information regarding the Society's regulations are obtainable from the Secretary Mr. D. Knight (address as above).

RECENTLY Willissen A. C. visited Uxbridge to watch a challenge match, and lost by 2 pts, the final score being Uxbridge 39 points, Willissen 15 points.

The individual results were:  
 Chairman: 1, Mr. Landon, Willissen; 2, Mr. V. Uxbridge, Cardiff; 1, Mr. Smith, Willissen; 2, Mr. V. Lunge, Willissen; 3, Chairman; 4, Mr. Uxbridge; 5, Mr. Porter, Willissen; 6, Uxbridge; 7, Labyrinth; 1, Chairman; 2, Mr. B. Landon, Willissen; 3, Labyrinth.

Willissen suffered a reverse previously at their meeting of the North West London Group. Shield event.

The great total of 84 pts. over their nearest rivals Riverside of Hammermith was cut to only 7 pts. this deficit being due solely to the magnitude fish turned out by Riverside that was above average in show condition.

Challenge points were gained by fish shown by Mr. R. Lunge and Mr. E. Landon. The points to date are: Willissen 77; Riverside 58; Independent 37; Hampstead 22; Hendon 20.

The contest was judged by Mr. Creed and a magnificent lecture on aquarism was given by Mr. Creed. At the breakfast contest, Mrs. M. Lunge walked off with all the awards to the Challenge Breeders. The winners of Challenge trophies were 1, Mr. E. Lunge; 2, Mr. Bartlett; 3 and 4, Mr. Porter. Interested persons in joining the club should contact the Hon. Sec. Mr. W. C. Hulse, 48 Dunscombe Ave., Bayswater, N.W.9.

At the November meeting of the Bedford and District A.S. a round table talk was held, when

the members of the society were invited to talk on problems of fish-keeping which they themselves had encountered. The Calum Trophy for Home breeds was won by Mr. B. Smith with a brood of parrus black mollies. The judge was Mrs. Meadows.

THE Table Show for October of the Bradford and District A.S. resulted in a win for Mr. P. H. Bushwartz and he also obtained the third award. Second place was filled by Mr. H. Gusswood. The leader of the Show Points Competition is Mr. G. Hildes. At the Leeds Open Table Show Mr. D. W. Asherian took first place in the Betts and Mr. L. Booth obtained first and third in the goldfish class.

New Club rooms have been acquired by the Leeds Aquarist Club at 9 Halsey Street, Leeds and the members have been lined at work recently on interior decorations. Three firsts were won at the S.A.S. Show and two seconds and a third. The result of the last table show was as follows: Livebearers: 1, H. Foster; 2, B. McLafferty; 3, J. Johnston. Goldfish: 1, L. Wilson; 2, D. Patterson; 3, G. H. Wilson. Guppies: 1, J. Johnston; 2, C. Bush. Judges: 1, E. Stuart; 2, Milne; 3, D. Patterson. The secretary is Mr. Ian Kilgour, 28, Rowall Quadrant, Edinburgh 5 and new members would be welcome. The results of the October members' show of the Marysville A.S. were as follows: Beginners: Livebearers: 1, J. Gusswood; 2 and 3, E. Collins (Mrs.); Labyrinth: 1, B. Parker (Mrs.); 2 and 3, B. Mullis. Chairman: 1, K. Farber; 2, R. O'Brien; 3, B. Mullis. Goldfish: 1 and 2, L. Paden; 3, G. Smith. Challenge: 1, P. Jordan; 2, S. Jarvis; 3, P. Newbold. Betts: 1 and 2, J. Foster; 3, M. Parker. Best in Show: J. Paden.

THE results of the Becknell and District A.S. Open Table Show were as follows: A.V. Woodward: 1 and 3, Mr. D. J. Woodward (Hounslow); 2, Mr. G. Howard (High Wycombe); A.V. Platt; 1, Mr. R. Dove (Becknell); 2, Mr. and Mrs. K. Baynton (High Wycombe); 3, Mr. R. T. Morgan (High Wycombe); A.V. Mollie; 1, Mr. and Mrs. B. Baynton (High Wycombe); 2 and 3, Mr. D. J. Woodward (Hounslow); A.V. Barb; 1, Mr. S. Pearce (High Wycombe); 2, Mrs. R. Dove

(Becknell); 3, Mrs. W. Voysey (Basingstoke); A.V. Chairman: 1, Mr. and Mrs. R. Baynton (High Wycombe); 2, Mr. R. Bell (Becknell); 3, Mr. V. Voysey (Basingstoke); A.V. Challenge: 1, Mr. R. Dove (Becknell); 2 and 3, Mr. J. Wilbers (Becknell); Dario W.C. M.M. and Barbora; 1 and 2 Mr. R. Honey; 3, Mr. R. Bell (Becknell); A.V. Footh Carp; 1, Mr. and Mrs. R. Baynton (High Wycombe); 2, Mr. R. Dove (Becknell); 3, Mr. K. S. Phillips (Becknell); A.V. Goldfish: 1, Mr. R. Morgan (High Wycombe); 2 and 3, Mr. J. Gusswood (Basingstoke); A.V. Father: 1, Mr. B. Hildes (Basingstoke); 2, Mr. R. Honey; 3, Mr. C. Dyer (Becknell); A.V. Labyrinth: 1, Mrs. M. Dyer (Becknell); 2, Mr. and Mrs. E. Baynton (High Wycombe); 3, Mr. D. J. Woodward (Hounslow); A.V. Male Guppy and Female Guppy (combined): 1, Mr. S. Pearce (High Wycombe); 2, Mr. R. Dove (Becknell); 3, Mr. G. Howard (High Wycombe); 4, Mr. G. Howard (High Wycombe); 5, Mr. R. Dove (Becknell); 6, Mr. C. Dyer (Becknell); 7, Mrs. N. Jordan (Becknell); 8, Mr. and Mrs. R. Baynton (High Wycombe). The Becknell Challenge Cup for the best fish in the show was awarded to Mr. and Mrs. R. Baynton (High Wycombe) for an Anabantus Anabantus.

#### NEW SOCIETIES

NOTIFICATION has been received of a new society in Wakefield called the Wakefield and District A.S.

The meetings are held the second Tuesday in each month at the Waterloo Inn, Waterford Road, Wakefield, and the officers are: Chairman, Mr. A. Bates; Secretary, Mr. S. Thompson; 76, Greenhill Road, Garstang, Wakefield; Motion Secretary, Mr. M. Dwyer; Treasurer, Mr. R. Pearson. New members are most welcome.

Particulars are also available of a new club at North Kensington, London, W.11. The meeting place is 80, Ladbrooke Grove, North Kensington, London, W.11 and the Secretary is Mr. W. Larnidge. This club is intended for tropical fish owners, who keep fish purely for a hobby as opposed to commercial breeders.

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**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.

**Powell, M.C.**  
The Hooley Pot,  
Claypath, Durham City  
Telephone: Durham 2108  
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**The Fish Bowl**  
Laura Street, Sunderland  
Telephone: Sunderland 69192  
E.C.D. Monday. 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.

**Skilton, C. J.**  
"Ridgeway", 139, Galleywood Road,  
Chelmsford  
Telephone: Chelmsford 56878. WR. C.T.P.A.A.

## HAMPSHIRE

**Arundel Aviaries & Fisheries**  
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**Wingate Zoological Supplies**  
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## HERTFORDSHIRE

**Cura, L. & Sons**  
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Telephone: Water End 44  
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**Wat-Pet Organisation Ltd.**  
66-68, London Road, St. Albans  
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## KENT

**Kingsfisheries Aquarium**  
138, Croydon Road, Beckenham  
Telephone: Beckenham 3716  
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## LANCASHIRE

**Hornby's**  
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**The Aquarium**  
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**The Goldfish bowl**  
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| Hygrophila              | 6d. |                          |             | Cabomba          | 1/6 |                     |     |

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# Shirley Aquatics Ltd

WATER PLANT NURSERIES AND FISH HATCHERIES—Phone: SHIRLEY  
Stratford Road, Monkspath, Shirley, Solihull, Warwickshire

## GREAT OFFERS OF AQUARIUM PLANTS

UNTIL JANUARY 14th ONLY

**CRYPTOCORYNE BLASSII** (Giant Wine-red) wild imported plants with very strong roots but foliage damaged 15/- each—3 for 37/6. **CRYPTOCORYNE APONOGETIFOLIA** lovely plants 10"-12" tall 12/6 each—3 for 30/-. **CRYPTOCORYNE THWAITESII**—beautiful small species—10/- each—3 for 20/-. **CRYPTOCORYNE WENDTII**—Pale green small plant—10/- each—3 for 20/-. **CRYPTOCORYNE WENDTII** (Brown sub-species) 15/- each—3 for 30/-. **CRYPTOCORYNE BECKETTII** (Bronze foliage) 5/- each—3 for 12/6.

### SPECIAL CRYPTOCORYNE COLLECTIONS

1 of each of above  
6 species for 50/-

3 of each of above  
6 species for £5

**LAGENANDRA TOXICARIA**—small dark green elliptical leaves—20/- each—3 for 45/-.  
**LAGENANDRA THWAITESII**—dark green lanceolate leaves with silver edge—12/6 each  
3 for 25/-. **LAGENANDRA OVATA**—pale green lanceolate leaves—7/6 each—3 for 20/-.

**SPECIAL COLLECTION OF LAGENANDRAS** one of each of above 3 species for  
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**APONOGETON FENESTRALIS**—Lace plant—plants in leaf 15/-—sprouting rhizomes  
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rhizomes 10/-. **APONOGETON NATANS**—Pale green Asian species—3/6 each—4 for  
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—3 for 25/-.  
**APONOGETON LORIEAE**—Midgreen Australian species with yellow flower 15/- each.

**SPECIAL COLLECTION** of one of each of above 5 species for 50/-.

**AMAZON SWORD PLANTS**—15"-18"—25/-, 10"-12"—15/-, 6"—7/6. **MELON  
SWORD PLANTS**—This handsome species with elongated oval leaves with beautiful ribs  
and veins 15/- each—3 for 30/-. **AMAZON SPEAR PLANTS**—(E. Muricatus) 20/- each.

**ECHINODORUS COLLECTION**—1 of each of above for 40/- (medium sized sword  
plants).

**JAPANESE RUSH**—Dwarf 3/6—Green 3/6—Variegated 5/-. 1 of each 10/6.

**ANUBIAS COLLECTION**—1 each of lanceolata, nana, congensis, afzelli for £4.

**XMAS PLANT COLLECTION**—20 plants including several choice specimens 40/-. **BARGAIN PARCELS**—30  
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**HOURS OF BUSINESS**—Weekdays 10 a.m.—8 p.m. Sundays 10 a.m.—12.30 p.m. (Sunday Afternoons Mar-July Only)

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