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Tetra
Fishkeeping Without Power

"Preserving the health of livestock" is one of the Scheduled purposes for which electricity can be used according to the Electricity Control Order 1973. Economies should be effected wherever possible and ROY PINKS here reviews what can be done to combat the effects of interruption to power supply to aquaria.

In view of international developments it may or may not be true that the only sure cure for winter power-cuts is for all pay negotiations to be carried out in late spring, and it is apparently inevitable that for some time to come the long-suffering public will have to endure the results of seasonal stoppages. To what extent aquarists need to worry about their charges depends rather on the habits and location of both parties. The fishkeeper who is away from home will be at a disadvantage, particularly if there is no-one who can be relied upon to render first aid in the case of absence over a period of days. In such a situation it must be assumed that losses or total failure may be incurred with tropical tanks, especially marine, if the power cuts are prolonged and the tanks are situated in unheated rooms. Disease, accelerated by unfavourable living conditions for the fish, is virtually a certainty too. Some form of personal attendance therefore, is a necessity, at least for part of every day. Experience has shown that those who go out to work each day for most of the day can surmount all but the most drastic and prolonged cuts by thoughtful and timely planning.

A source of heat for the room is a prime consideration, and the safety-approved paraffin heaters will come most readily to mind. Carry out some trials in the rooms affected before the trouble starts, and see how many heaters you need to keep the tank's vicinity between 65° and 70°F. Do this with the curtains drawn—on frosty days you would need to keep them so in order to conserve the available heat. If you can arrange for light-coloured, thinish curtains to be put up, so much the better, as a planted tank, in a continuously darkened room can develop trouble, particularly if there is overcrowding of fishes. Any light you can introduce to the room and to the plants in the tank during the day will therefore be beneficial. In theory you might consider turning night into day by completely blacking out by day and leaving the aquarium lights on at night, when, presumably, the cuts will be of less severity.

Conservation of heat within tanks may be achieved most readily, again before the event, by cutting thick expanded polystyrene sheets to the size of the end, back and top panels of the tank (and the bottom, if it is on a stand and exposed to the air). Cement these to the glass and leave them there for the duration of the emergency. For the front panel cut out a sheet of thin polystyrene sheeting: this is for clipping into place at the beginning of each cut or, for the person away from
It is regretted that owing to 'fuel crisis' production difficulties this month's issue is reduced in size and some regular features have had to be shortened or held over.

crowded or nearly so, it is worth considering whether you can distribute your fishes more equitably within the overall confines of your collection. Consider, too, whether you can press into duty any tanks temporarily lying fallow to relieve the competition for available oxygen. Large inner tubes or air mattresses can be filled with air and coupled up to your airline, with the input throttled well down, and this will materially help in the case of an overcrowded freshwater tank, though I am less convinced of their value to marine tanks. Feeding should be reduced to an absolute minimum, and live offerings should be given whenever possible. To avoid pollution, all waste food should be removed promptly, especially in saltwater aquaria. There are now some very good vitamin preparations on the market, and it would seem that they might well supply a need during periods of restricted feeding, though of course the dosage should not be exceeded.

Despite the state of unpreparedness of many fishkeepers during the time of the last power cuts, the actual losses sustained were, I believe, much less than had been feared. This was no doubt due in some way to the exceptionally mild weather which prevailed, and we have no right to expect such leniency whenever trouble strikes, so it is up to all of us to get our systems into the first state of readiness right now. Throughout, watch for disease most carefully and treat suspicious symptoms promptly. During bad times your fish will have been weakened by the degraded conditions to which they have been subjected, and some may die, but I hope these will be the exception.

At all costs do not use any form of paraffin heating which has not been approved for domestic use. Some greenhouse heaters, for example, are unsuitable, as they are prone to being knocked over, and the non-blue-flame type can emit sooty clouds which will ruin your home and smother your fish. Make sure that your emergency heating equipment is in safe working order, and that it is regularly replenished with fuel. Since there are some who would have benefited from the advice, I would also add that paraffin burners go out if you add water to them and blow up if you add petrol, hence all fuel containers should be unmistakably labelled and no fuel should ever be used if there is the slightest doubt as to what it actually is.
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Aquarist in Thailand
An aquarium-keeper's Paradise

By LADDIA TONGSOOK
Photographs by the author

I never cease to marvel, when I pick up the latest issue of an aquarium magazine, how the English aquarist takes his fishes, his equipment and his fishes' food, especially with the approach of winter when even coldwater fish have to be cooed.

It's different here. You don't have to worry about heaters—well, some aquarists may put a 60-watt heater in a large discus tank when our December-February winter strikes and early morning temperatures may, for a few days, drop to the chilly seventies. But, usually, aquarium water stays in the 76-82°F range from sheer circumstance.

Not do we have to worry about freeze-dried live foods, or dry foods which will wilt, because in every suburban shopping centre in Bangkok there will be one, or two or three tiny shops with great tubs of mosquito larvae and frequently water fleas, bloodworms and, occasionally, tubifex—all alive and well. There is often on sale, too, the large larvae of the filth mosquito (Armigeres). And, if you must have dry food, dried prawns are part of the Thai diet and your maid will efficiently smash them up, for you in her pestle and mortar (essential equipment in every Thai kitchen).

Nor do they have tropical fish, by definition, in a tropical country. In fact, if you go back to old reference texts like James' EXOTIC AQUARIUM FISHES, and don't count those myriad of: never-available fancy African fishes, then at least 50%, of tropical fishes come from Thailand. Don't be misled—and this makes me mad—by the fact that textbooks note the range of many far-eastern fishes as 'India and Indonesia'; in fact, India and Indonesia are only the extremes of the radial occurrence of the fish. This central blind-spot is, of course, due to the diligence of early British and Dutch ichthyologists—such is the history of the world.

Thailand has a large range of the cyprinids, the rasboras and the loaches, the silurids and the clarids, the ambastids and the gobies. It has
more than its share of 'odd-balls' such as the feather fin \textit{(Notopterus)}, spiny eels \textit{(Macrognathus)}, the archers, the algae-eating catfish, the half-beaks and pipefishes. Much sought after are the red-tail shark, the climbing perch, the tinfoil bream, the silver shark \textit{(Balantiocheilos melanopterus)}, the Siamese fighters, and the very rare \textit{Ostegoelius formosum}, which is even more beautiful than its South American cousin, the arowana.

There is a saying, so my Australian husband tells me, that 'a prophet has no honour in his own land'. And so it is with Thai fishes. The most expensive fishes commonly available here are discus and oscars, both of South American origin but now frequently bred here. I wonder if I should say oscars are really exotic, because it was a Thai, Mr Charoen Pattabongse, who gave the world the first red oscar. You can buy \textit{Leporinus}, headstanders, tailstanders and elephant noses here and, until recently, piranhas, when their import was wisely banned.

Where do you buy fishes in Bangkok? Well, there are the usual tropical fish dealers scattered throughout the Metropolis, but by far the most interesting source is the so-called \textit{Week-end Market} at the Pramai Ground. Here, among a thousand or more stalls selling everything from a needle to an anchor, are about 20 stalls selling tropical fishes, aquaria and the accoutrements therefore. Here, because the stalls are all cheek-by-jowl, you can bargain keenly, a necessary part of Thai shopping.

In the food section of the Bangkok market, aquarium specimens can be picked from the trays where they are kept alive although destined for the table. Thailand’s annual catch of clarias catfish is officially 20,000 tons although annual consumption must be many times this amount. The ‘Siamese shark’ \textit{Pangasius} pangasius is commonly raised in ponds for human consumption.
Book REVIEW


"The water, you see, is everything. It's as simple as that". Thus Stephen Spotts, American professional aquarist, concludes the Preface to his latest book to emphasise that in marine aquaria-keeping especially it is the skill of the aquarist in maintaining a satisfactory state of the sea water in his tanks that determines the degree of his success. Although, the author does not in fact pretend that this is child's play he does everything possible to show that it's not impossibly difficult either. He is highly practical and very readable; his technical approach to the subject is in parts undoubtedly not everyone's cup of tea, but for those who want to know why certain procedures are advocated and who appreciate the need for discussing, say, the "turnover rate" of a filter in terms of its practical measurement and the actual value in gallons per minute per square foot of water surface, this book can be highly recommended.

The two main sections of the book consist of chapters involved with the section headings 'The Science' and 'The Animals', well illustrated with photographs and line drawings. Eight pages in full colour are included. There is also a third section of 20 pages called 'The Art', and in this there are full instructions for making moulded fibreglass duplicates of corals for use in the tank or its decorative background, a technique used in public aquarium displays.

LEG OF THE WORLD: JAPANESE COLOURED CARP by Dr Herbert R. Axtoff. T.F.H. Publications Inc. Ltd., Hong Kong. £3.50.

There should be a law against books like this one. Heaven only knows how many homes will literally be wrecked as koi enthusiasts, driven to heights of fanaticism by the book's photographs of superb carp and beautiful ornamental ponds
Aquarium-keeping in Dutch Homes

Review of Hendon Congress lecture by Mr W. A. Toney

"ONE of the very best" was the rating of the 1973 Hendon Congress, and following is an account of some of the highlights based on notes by Mr Henry White of HENDON & DAS of this most interesting occasion. "We knew that Mr Toney was a professional lecturer; we knew his English was good—and after seeing just a few of his slides we knew that his material was of the highest order. For the first half of the evening, Mr Toney described and featured some magnificent aquariums in the homes of Dutch aquarists, impressive not only for their size and construction, of which one was described in detail, but for the amazing display of plants. Starting by comparing a modern office with steel furniture with the décor in an old-fashioned home, Mr Toney stressed the importance of designing the aquarium to fit in with the surroundings. The lighting used was very intensive. The tank under construction incorporated four tubes and five lamps in the hood with reflectors to obtain maximum efficiency. The duration of the lighting would be from 8.30 in the morning to 7.30 at night (and in order to prevent discomfort to fishes, such as Anostomus anostomus, that preferred to hide in darker corners great care was given to the design of the tank furnishing. Generally the substrate was composed of unwashed gravel, peat and clay covered with washed gravel. Base heating was included; under-gravel filters were thought by many Dutch aquarists to be essential equipment, others preferred not to use them. Temperature, based on fish requirements, was quoted as 82–91°F (28–33°C).

The plants were chosen with enormous care, and one tank illustrated contained only plants grown from cuttings received from fellow club members. Leaf coloration and shape were carefully considered and great use was made of wood as a base for plants like Java fern. To keep the tanks looking superb and the overall pattern maintained the plants had to be shortened and pruned every 7 to 14 days and 6 in. of water replaced. The tanks were stripped down every 2 years and the substrate was replaced.

In the second half of the programme Mr Toney described the 'dry filter' that had been featured in Petfish in the November, 1973, issue. Then on to further magnificent slides of fishes. After seeing a shot of Aspius annulosus it was interesting to learn that German aquarists were breeding some six species of clowns.

It was also interesting to hear first-hand of the effect of a sting from a scorpion fish—not a pleasant experience apparently. At one stage Mr Toney, stressing that most South American fishes live on insects, was surprised to learn, by direct questioning of the audience, how few cultivated fruit flies and Grindal worms. Mr Toney's own fruit fly culture, we learnt later, was 16 years old, and was kept in constant use supplying food for his poisonous tree frogs from Central and South America. The slides of these fantastically coloured frogs were very popular; night frogs with huge red eyes, and an excellent shot of one attached to a sheet of glass, showed the suckers on its feet. When Mr Toney showed us his finest picture, of the tongue of a frog in action, spontaneous applause came from the audience. The camera used was a Hasselbach producing 24 in. by 2½ in. slides, shown with the latest Rollei Projector, capable of zooming. Mrs Toney did the excellent job of projecting the slides—the very first time the lecturer did not have to ask for the picture to be focused just a little sharper.

Before the Convention opened, and in the interval, guests had a variety of exhibits to view—Hend-
First Scientific Evaluation of Chloramine T in the
Treatment of White Spot Disease

Although it is some years since the medical antiseptic known by the common name chloramine T (chemical name sodium paratoluene sulfonochloramide) was first marketed in Europe for the use of aquarists to cure white spot disease, the first scientific evaluation of its effectiveness has only just been reported.

Harlequins (Rasbora heteromorpha) and roach (Rutilus rutilus) with the infestation were the test fishes used in this work, undertaken by Dr. D. G. Cross and Dr. P. A. Hursey at the Salmon and Freshwater Fisheries Laboratory of the Ministry of Agriculture, Fisheries and Food. A review by Dr. Cross in 1972 of methods of treating white spot disease (reprinted in PFM, October 1972) indicated that chloramine T was a useful agent for fish treatment provided that effects of water reaction (pH) and water hardness on it are taken into consideration. Accordingly the latest work reported has carefully examined how chloramine T acts in soft and hard waters of various pH values (acid, pH 6.0, to alkaline, pH 8.0).

Chloramine T produces its action on the free-swimming white spot parasite by the production from the solid, when it is dissolved in water, of hypochlorous acid, a weak acid which as well as killing parasites is also harmful to fish above a certain concentration. The acid arising from the chloramine T is more stable in acid water than in alkaline water, and this probably explains the finding that chloramine T is more active against the parasites (and also more toxic to fish) in acid than in alkaline water.

From trials with various concentrations the 'therapeutic dose' for infested harlequins and roach, that is the dose that will kill the parasites without harming the fish, was worked out under various conditions of water hardness and pH. The findings are summarised in the table, taken from Cross & Hursey's paper in the journal of Fishery Biology (1973, §, pp. 784-798). The recommended procedure for treatment of static water aquarium with chloramine T is as follows:

1. Siphon out all mulm, sediment etc. from the tank.
2. Turn off any filtration equipment in use but provide gentle aeration, particularly for planted aquaria.
3. Add the required amount of the chloramine T to the water (according to pH and hardness) after dissolving the solid in a little of the tank water first.
4. Repeat the addition of the dose once a day until the fish seem to be clear. For tanks kept at 25°C (77°F) this will be about 3 days; for coldwater fishes longer periods are necessary (about 3 weeks at 50°F (10°C)). Half the water in an aquarium should be replaced with fresh water every week the treatment is being applied.

<table>
<thead>
<tr>
<th>pH</th>
<th>Dose of Chloramine T (mg/litre (mg/gallon))</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>2.5 (11) Soft water</td>
</tr>
<tr>
<td>6.5</td>
<td>5.0 (23) Hard water</td>
</tr>
<tr>
<td>7.0</td>
<td>10.0 (45)</td>
</tr>
<tr>
<td>7.5</td>
<td>15.0 (68)</td>
</tr>
<tr>
<td>8.0</td>
<td>20.0 (90)</td>
</tr>
</tbody>
</table>

Values in parentheses are the doses in milligrams per Imperial gallon.

In the work quoted this treatment has been applied successfully to species of tropical and coldwater fishes other than the two (harlequins and roach) selected for establishment of the therapeutic dose. Additionally, tests were made of the effects of the presence of the metals mild steel and lead, in view of past statements that bare metals accentuated the toxicity of chloramine T, but no
significant change with these metals present was
found.
Since chloramine T is decomposed in water it
is necessary to keep the solid, and any tablets made
from it, perfectly dry to preserve the efficacy; it is
clear that the moist air of a fish room or fish house
is not the best environment in which to store this
particular remedy.

Personal COMMENT

A problem often encountered in the freshwater
aquarium is the build-up of unwanted algae, espe-
cially in those places one wishes most to keep
clean. We see hairy growths appearing daily
all over the leaves of our most precious plants,
from whence it is most difficult to dislodge them,
whilst the tank glass, comparatively easy to keep
clear, remains virtually unsullied. There is, of
course, lots of misspent hysteria over the undesir-
ability of algae, and it should not be assumed that
it is an unmitigated evil. At all costs one should
avoid the usually quite erroneous notion that green
water is in some way unwholesome or unhealthy,
'stagnant' etc. It is quite true that some green
water or even clear water containing anchored
algae may be evil-smelling, but this condition arises
from decomposition, not from the growth of the
millions of plant cells which is what algae are.
How often have I heard parents refusing to allow
their offspring to keep fish because they equate
them with green water and equate this again with
intolerable effluvia. Even in this day and age
learning seems to have progressed slowly in matters
such as these.

The young aspirant to fishkeeping may there-
fore be advised to counter any such old wives'
tales with the simple statement that even if
green water does come it can be defeated readily
enough without the nostrils ever having been
aware that any problem existed. It is quite true
that the most sinister forms of algae—the free
swimming types—can be rather difficult to remove.
Their growth arises because of too much light,
and if you are unable to re-site your tank or to
shade it in a suitably aesthetic way, it can remain
something of a problem. Other, anchored, forms
are another matter altogether, and may be dis-
posed of either by introducing fish, or other
creatures which appreciate some vegetable matter
in their diet, or by manual removal.

The latter method is particularly appropriate
for the tank glass and for internal tank fittings,
but great care must be observed if any attempt
is made to remove algae from plant leaves, because
even slight over-enthusiasm can result in
irreparably damaged surfaces. This is especially
so for fine-leaved plants like Myriophyllum and
Cabomba, but the Echinodorus and Cryptocoryne
species, usually regarded as inviolable, need nearly
as careful treatment. It is worth a little thought
whether other methods could be applied before
resorting to what could be unnecessarily drastic
counter measures.

Obviously, fish may straightaway come to our
rescue, and it will be found that very many more
fishes eat algae than do not, so whatever you keep
in your tank, some relief will be provided by the
fishes themselves provided that you avoid cram-
ing them from nose to tail with flake food, worms
and every other sort of tit-bit designed to distract
them from what could be a most useful job of
work. Most fishes are overfed, grossly or other-
wise, and in these conditions algae will certainly
build up, often to embarrassing proportions. The
Otocinclus, the sharks and most of the live-bearers
are regular algae-eaters, but watch other fishes
nibbling away at the young filamentous growths
on plant leaves, and you will add lots more names
to your list of allies in this particular engagement.

If you wish to protect certain parts of your
tank from algae growths you may find it possible
to arrange for rock or cork bark outcrops to over-
hang the affected areas, assuming, of course, that
the offending light source comes from above.
Similar manipulation of floating plants, especially
of Riccia, will enable selective shading to be
carried out, though this is usually at the risk of the
floating plants, which themselves become inextri-
cably involved with algae and sometimes perish
in the process. It is a good idea to net out all your
Riccia from time to time and subject it to a strong
jet of water from the coldwater tap. If this is
applied effectively, keeping the Riccia in the net
all the time, a new lease of life for this delightful
plant will have been achieved.

On the whole, I would rather have a tank with
algae than without it, and I am sure my fish would
go along with this. The application of chemicals
is a foolish practice and a waste of your money:
use your head to solve the algae problem, not some
unspecific liquid from a bottle.
Coldwater Fish Food

Supplies the Aquarist can Make in Bulk

In an article that appeared sometime ago (in the July, 1971 issue of F.S.2) I described my homemade food which I use for feeding my fancy goldfish. Over the months I have endeavoured to improve upon the original well-tried recipe and have now arrived at the stage where the food is eagerly accepted by most coldwater fish. Firm steady growth is maintained and very little clouding of the water arises, provided, of course, that the fish are not overfed. As a number of readers appear either to have missed, or to have mislaid, the recipe which was given at that time, this month I shall commence by giving instructions for the preparation of this mash.

Although virtually any meat can be used, I find that the simplest method is to purchase a can of dog meat. The size of can selected is dependent upon both the number of fish to be fed and the storage facilities which you have available; a deep-freezer allows a year’s supply to be made and kept until required. For the purpose of this recipe instructions will be based upon the small-size can of dog food, from which the requirements for a larger supply can be worked out.

Apart from the can of meat the following ingredients will be needed: a packet of Remax, or similar wheat-germ powder; bony fish meal; a small quantity of calcium carbonate; a packet of Vetyxine tablets; a jar of honey; a packet of pure gelatin crystals. These items should all be obtainable from your local chemist or Boots Drug Store. In addition you will require cheese, roughly equal in bulk to the dog meat, a medium-size carrot, three or four sprouts or equivalent amount of either green vegetable, and an egg.

Start to prepare the food by straining off the liquid from the canned meat, but do not throw it away. Mince the meat as fine as possible, and grind up the cheese and brussels sprouts together with the carrot. Place the mixture in a saucepan and add the previously strained liquid, if necessary adding some water so that the ingredients are just covered. Simmer the saucepan’s contents over a low heat, whilst stirring to prevent the food sticking or burning, until the cheese has melted and the whole has blended together. Remove the saucepan from the heat and stir in a teaspoonful of honey, two tablespoonfuls of calcium carbonate and two crushed Verodine tablets. Crack in the egg and beat the mixture until everything is thoroughly mixed together. Next add the wheat-germ product, which should be blended in until the mixture becomes a thickish, doughy ‘pudding’. Finally, take half a cup of boiling water, mix in two full teaspoonfuls of gelatin crystals and pour this straight into the ‘pudding’ and mix thoroughly. The food must now be put into suitable containers, whilst still hot, and allowed to cool.

When it has set it will have a slight rubbery texture. The food can then be placed either in the refrigerator or a deep-freezer, where it will keep indefinitely. Alternatively the food can be forced through a ¾ in. sieve, to form long ‘worms’, and slowly dried in a warm oven, after which it can be broken to size and stored in close-stoppered jars.

* * *

Over the past months I have been testing a food which I have found quite satisfactory and can fully recommend as a suitable diet for coldwater fish. Manufactured by Quaker Oats Ltd, it is a new form of dog food known as Minced Morsels and has been extensively advertised on T.V. by Clement Freud and Henry, his bloodhound. Packaged in cellophane bags, the food is short moist worm-like lengths and will keep, without any special conditions, for a long time without any visible signs of deterioration or drying out. When left for a period of 48 hours in water I found that no ‘furriness’ had developed and when offered to a fish it was accepted without hesitation. The food is produced from soya, meat by-products, sugar, stabilised animal fat, preservative, minerals, stabiliser, vitamins and colouring and the analysis reads: moisture, 25.0%;; dry matter, 75.0% (made up as protein, 19.0%; fat, 0.0%; fibre, 2.5%; mineral matter, 5.0%; sodium chloride, 0.78%; calcium, 0.8%; phosphorus, 0.8%; gross calories, 1400 kcal/lb. The vitamins comprise A, D and E, thiamine, riboflavin, pyridoxine, calcium pantothenate, choline chloride, niacin and B12. Inorganic content includes calcium,
phosphorus, potassium, magnesium, iron, cobalt, copper, manganese, zinc and iodine.

Possibly a quote from a letter from the manufacturers replying to a query I had sent to them will serve to illustrate my approval of this product... one of the government agencies in Scotland has contacted us in regard of the potential use of Minced Morsels in efforts to protect the salmon industry there. Evidently, one of the reasons for the suitability of Minced Morsels is its moisture content... Where possible all food should preferably be fed in a moist state, rather than dry; for if the fishkeeper passes to think he will realize that in Nature no fish eats food that is dry in the way that most pre-packed foods are dry.

* * *

The late Dr Myron Gordon of the New York Zoological Society devised a fish food now known as 'Gordon’s Formula', which is made as follows. Pulp 1 lb. of raw ox liver, after first removing blood vessels and other stringy tissues, and place in a bowl with an equal amount of water. Add two teaspoons of non-iodised salt. Blend the mixture thoroughly and then strain it. To the mixture add 20 tablespoonsful of pre-cooked cereal baby food and mix this in well. Glass jars should then be filled with the food and placed uncovered in a saucepan of cold water, which must be brought slowly to the boil; lower the heat and allow the jars to stand in the simmering water for half an hour; after which the heat should be turned off and the food allowed to cool gradually until cold. When cold the jars can be covered and placed either in a refrigerator or deep-freezer until required.

There are many food formulae for coldwater fish—especially the fancy varieties of goldfish—that breeders have developed and which must treat as 'highly secret' recipes, the ingredients and methods of preparation being closely guarded from all enquiries. This, to my way of thinking, is a most ridiculous attitude to adopt.

* * *

Towards the end of the old year information reached me of a new specialist society that has been formed in the London area, with the title of the Association of Goldfish Breeders. One of the main aims of this group of goldfish fanciers is to unite all goldfish keepers in a common aim—unity within the hobby. They hope to arrange a meeting, at a future date, when the various problems that beset our hobby can be discussed and resolved in a friendly way, without the bickering and petty jealousies that have bedevilled similar discussions in the past. From this they hope to find a basis that will result in a single set of National Goldfish Standards and Judging Rules that will be agreed and acceptable to all. I sincerely hope they are successful and achieve their aims.

At the moment the hobby is so fragmented and it seems that new standards are appearing faster than fish can be bred. Ours is the only hobby in which so much confusion exists, every other fancy, be it cats, dogs, cage birds, poultry or even horse, has only one set of standards by which the show entries are judged. It is time that the goldfish keeper stopped behaving as aimlessly as his fish and learned to work with others for the common good and to the benefit of all.

For some time I have endeavoured, through various channels, to interest Midland goldfish keepers in forming a specialist society of people with similar interests, but the response has been very poor, and there does not appear to be any enthusiasm for such an association, even though it is only by the banding together of specialist groups that unity can be brought to the hobby.

Possibly the British Koi Keepers Society could be held up as an example. This national society has been in existence for only 3 years, and they have unity within their ranks, and local groups are encouraged and formed. A Newsletter appears at regular intervals, in which members reveal their failures and successes with their fish. As experience is gained so it is made available to the whole Society membership. Although they do not have show standards I think that when the time comes for Koi Standards to be produced the same unity and common sense will prevail and will result in a true National Standard that all koi-keepers will accept as the only standard by which their fish should be judged.

Amongst experienced goldfish breeders I have heard the view stated that they believe many will desert the ranks of goldfish keeping and go over to keeping koi. Some view this prospect with dismay. Unless the fancier of goldfish can achieve a sensible attitude to standards and clear up the existing confusion and mistrust then he will have no one but himself to blame for the sadly depopulated ranks that remain.

If all fanciers, both novice and old hand, were to make their views known the numerous societies and federations might possibly come to their senses, swallow their pride and petty jealousies, and decide that enough confusion has been caused and that it was now time to scrap all existing standards and finalise a single set of National Standards and Judging Rules for Fancy Goldfish. Only by resolving the present ridiculous situation will the goldfish preserve its place within the aquarium hobby and attract and retain newcomers. With goodwill the solution can, and must, be found.
PRESSURE waves in water can give rise to one form of communication in the fish world. The majority of fishes are extremely sensitive to changes in pressure in the water, this sensitivity being a product of the lateral line, which in typical fishes is a canal under the scales containing special clusters of sensory cells called neuromasts. These cells are elongated, and each bears a projecting hair-like structure which is almost invariably covered with a gelatinous structure called a cupula, which waves freely in the fluid of the canal. The neuromasts respond to waves or disturbances in the water through movement of the cupula and consequent bending of the hair-like processes. The signals from the neuromasts will supplement vision by making the fish aware of moving objects—prey, enemies and even fixed obstructions which will cause local variations in the normal water pressure.

One important function of pressure sensitivity is in schooling fishes, which need to maintain station accurately. This is done by constantly monitoring the local pressure situation—when swimming in a straight line this will be relatively constant within the school, but if a fish suddenly turns, or makes an unexpected movement, this will register as a difference in pressure to the other fish and they in turn may move with the lead fish as it turns towards food, or away from an enemy. This pressure detection is only supple-
During breeding the 'whiskers' of Corydoras catfish are used to signal willingness to spawn by touch.

Fins usually means that danger is approaching and causes the young to hide or 'run to mother'. The reception of this message is certainly by the lateral line. Many other stimuli that we know nothing about are probably also picked up by the lateral line receptors, as it is difficult for us to visualise these pressure waves as we have no similar sense organs, whereas we can appreciate the sounds that fish hear, and what they see.

**Electrics and Fish**

Many electric fishes are known, such as the electric eel (*Electrophorus electricus*) and the electric catfish (*Malapterurus electricus*). These fishes produce extremely powerful discharges, up to 600 volts over a period of a few thousandths of a second with a current of about 0.5 amperes—enough to light a bulb briefly. These spectacular discharges are usually used to stun prey and have been developed from special serial muscle cells accounting for some 50% of the body weight in the electric eel.

However, there are other, less spectacular electric fishes which produce only a few volts from small organs in the tail. These are the well-known elephant-nose fishes (mormyrids) which send out electrical impulses almost continuously at an average rate of about 300 per second, at a tension from 3 to 7 volts. Apart from sending these signals, the fish are extremely receptive of them and seem to be able to use them primarily as a kind of electric 'sonar', where disturbance in the fish's electric field registers as an object to be avoided if the disturbance is large, or to be investigated if the disturbance is small. Apart from this navigational aid, it is postulated that the electric signals could be a means of communication between members of the same species, enabling them to establish agreed territorial boundaries. However, this research is still much in its infancy because of the difficulty of making recordings, as any object placed in the water alters the fish's electric field, and thus distorts readings.

**Functions of Communication**

The various uses of the different types of communication found in fishes have been briefly mentioned in the appropriate sections of this series of articles; and can be summarised here as occurring in the following situations:

1. Sex determination
2. Species recognition
3. Individual recognition
4. Messages of warning, threat, defence, neutrality
5. Reproductive behaviour: spawning, territory defence, guarding and herding young

The above short list is by no means comprehensive or detailed; but it gives some idea of the range of functions of communication. For further information about all of the aspects of communication mentioned, and further examples, the following books and articles:

**General information**

Burkhardt, Schleidt, Altner. *1967* Signals in the Animal World. George Allen & Unwin Ltd. (A very readable account of the uses of sense organs in all animals, but with several chapters devoted to fishes.)


**Specialised information**

Kleecknoper, *1969* Olfaction in Fishes. University of Indiana Press. (A highly detailed account of smell in fishes, but with some 50 pages devoted to olfaction and behaviour, of interest to the aquarist with biological training.)


Pfeiffer *1962* The fright reaction of fish. *Biological Reviews*, 37, 495–511. (The fright reaction among the Osteariophys, and its specificity. Interesting article of general interest.)

Fish, Mowbray. *Sounds of Western North*
ATLANTIC FISHES. (Contains over 200 spectrograms from fishes as diverse as eagle rays and seahorses.)

All the above contain further, often extremely comprehensive, bibliographies which will be of interest to the specialist. Most of the books are available to special order from county or university libraries.

Observations of Behaviour

Fish behaviour is an extremely complex and fascinating subject; however, there are one or two points which need to be borne in mind about its study in the aquarium.

1. Fish may not behave normally, or react as they normally would in the wild, in the confines of an aquarium.

2. In a small volume of water, any communicatory substances released will not become diluted and may have an exaggerated effect.

3. Sounds and electrical signals may be distorted by the walls, or metal frame of an aquarium.

Despite these limitations on the observation of behaviour in the aquarium, most of the work, of necessity, has to be done under these conditions owing to the difficulty of observation in the field. Thus the aquarist is often in just as good a position as the professional fish behaviourist to study his fishes—many a new phenomenon in fishes has been found by an aquarist reporting some unusual finding in a magazine article. So please aquarists, if you notice anything unusual that your fish do—or if you spawn a rare fish—make observations and record them, and then report them somewhere. It doesn’t matter if it turns out that someone else has already spawned arapaimas and found that they constantly talk to their young or whatever, nobody will criticise you for repetition—most scientific work consists of repetition anyway.

So let’s have those articles or reports, you people I know to be spawning Julidochromis, Lamprologus auratus elongatus etc. Don’t be selfish!

Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London SW17 0NY.

To the Sit-at-homes

This year’s (1973) Hendon Congress was ranked by all who attended as one of the best ever—why then was there such a disappointing attendance? We cater for 400, but less than 200 came. What does the British aquarist want? Of all the clubs affiliated to the FBAS only a mere eleven could produce a tableau at The Aquarium Show 1973. Everyone knows that few societies can make their open show pay. What, then, do aquarists want?

As regards the Hendon Convention we really could not blame the petrol shortage. Even societies from London and the Home Counties made no effort to hear Mr W. Toney—a Dutch lecturer with an international reputation. Please write and let us know your views.

In the meantime, we shall continue planning for our 1974 Congress.

HENRY WHITE
Hendon & District Aquarists Society

Rescue at the Show

May we express, through the medium of PFM our grateful thanks to the unknown (to us) young man who came to our rescue, with the length of swimming pool lining for our ‘tank’ at The Aquarium Show. This obviously saved the day for us. If he would like us to return it, I will gladly post it back to him.

We would also like to thank you and your staff for the help and kindness that we received at the Show—it really is a friendly social occasion to us. Looking forward to The Aquarium Show ’74.

(MR) J. STILLWELL
Portsmouth Aquarists Society

The Aquarium Show dates this year are 25th to 27th October.—EDITOR.

I WISH to thank you and the officers at The Aquarium Show for their kindness and consideration in dealing with fish sent to you by train from Newcastle to the Show, and on behalf of my wife and fellow aquarists say how much we enjoyed the Show and that we will most certainly come again.

G. T. LEDDE
Tyne-Tees Area Association
Keeping and Breeding

**The Serpae Tetra**

*Hyphessobrycon serpae DURBIN*

THE serpae tetra holds an honoured place in the large and very popular family Characidae. This is not surprising since its blood-red colouring makes it a very desirable acquisition to aquarists. From a distance, a shoal of these tetras mixed with other tetra varieties and housed in a well-lit, thickly planted tank, makes an unforgettable sight.

The fish's natural habitat is the Rio Guaporé and Amazon regions, and they were first introduced into Europe in 1924 when they were incorrectly designated *Hyphessobrycon minor*. Even today they are mistaken for *H. callistus*, but this is by no means a serious error to make since, as with other species in this group, there are a number of 'forms' or varieties that make it difficult even for the expert ichthyologist to differentiate between them. According to Sterba, the species of the genus *Hyphessobrycon* are differentiated from the closely related *Hemigrammus* species by the scale-less base to their caudal fin (in *Hemigrammus* the base of the caudal is scaly).

As I have already hinted, the serpae tetra is a shoaling fish so that one should keep 8-12 specimens in not too small a tank. They do best in a well-lit, medium to large tank, at a temperature of at least 68°F (20°C). The water should be clear, moderately soft to slightly hard and slightly acid (these water conditions apply for most of the other small characín species). Sex differences are not always easy to

Translated by F. MARSH

By RUDOLPH ZUKAL

Photographs by the author
During courtship fluttering movements of the male (left fish in the picture on the facing page) entice the female to follow him into the plants. In the spawning area the male swims at the side of the female, approaching closer and closer as they swim round (photographs above).

distinguish, for the male and female fish closely resemble each other and have the same colouring. But the adult male is slimmer and when his body is viewed against the light the male’s swim bladder can be seen to come to a point in the rear.

For breeding purposes a male that is already displaying is selected from the shoal. The fish will be eager to spawn and a 3–4 gallon (10–15 litre) glass tank will be quite suitable for them. The water for this tank should be soft and the temperature must be raised to 75–78°F (24–26°C). The male is put into the breeding tank a day before the female and some fine-leaved plants for the fish to spawn on should be supplied. The male will begin the display, fluttering in front of the

As spawning (right) an extremely rapid contact of the bodies of the pair occurs followed by their immediate separation.
The Pearlscale Goldfish Variety

There are at least three genetically determined shapes of scales on goldfish. They are the normal, the hammered and the pearl scale. The hammered has a partially concave surface and the region where the maximum reflection occurs appears as a bright spot. It is a rare character and probably a recessive trait, but in some insemination of common goldfish a proportion with this 'hammered' factor may be observed. It probably would not be noticeable on calico fish as the necessary shine would be absent. There is no reason why it should not appear on any variety of goldfish, but I can only recall it on singletailed fish.

The pearl scale has a 'domed' portion, that is to say, it is convex and therefore the reflected light will be spread. With a calico fish the shining guanine backing to the scale will be missing and the layers of tissue forming the 'dome' will be opaque, and this gives a 'pearled' appearance. The metallic 'pearl scale' will have the same shape and little obvious knobs appear in rows, but there is too much shine to make a 'pearled' appearance. This factor is recognised by the Goldfish Society of Great Britain only on a divided tailed, double anal-finned, deep-bodied fish, with short to...
Characteristic outlines of a specimen pearl scale seen from the side and from above (lower drawing). Illustrations from the Standards Book of the Goldfish Society of Great Britain and reproduced by permission.

Medium length upward-perked caudal fins similar to the fantail.

However, another notable feature of the body is that it is exceptionally globular and the scales do not lie so flat as with a normal fish—indeed they seem to protrude somewhat. This appearance seems to be caused by a separate genetic factor, which swells the body in a droopical manner. This gives the possibility of seeing slightly under the scale of the pigment unbacked by guanine on the underlying scale.

Unfortunately, the raising of the scales does
allow entry for some parasitic organisms into the dermis. Red spots sometimes appear and this condition I cure with acriflavine, but it would be better to keep the water cleaner. I suspect also that some aquarists have had trouble with the descaling mite, which would have easier access. Moreover the protruding scales are not so firmly fixed in the dermis as are normal scales and the slightest rough handling can knock them off. Because of the angle of the scales and the opaqueness of the pearls, blue is seldom apparent on adult calico pearl scales. Blue is caused by black pigment below the dermis.

Three other groups of scales can be identified in addition to the varying shapes. The normal scale has a mirror-like backing of guanine where it is not overlapped by surrounding scales. This gives it a gold or silver appearance. The second type is transparent with no guanine backing. This gives rise to the 'calico’ appearance. If there is no guanine in the layer below the dermis then the transparency will be greater and there will be very little pigment. This type of fish is called ‘matt’.

If, however, the second layer of guanine appears partly or wholly below the dermis then this gives a mother-of-pearl effect and the group is called nacreous. Black pigment deep down below or in association with this second layer of guanine gives a blue effect, although black pigment above the scales or in the fins appears as black. Orange or yellow pigment may also appear on the scales and in the finnage. This colourful effect, as in the Bristol shubunkin, is very much sought after by aquarists, but it is an intermediate or hybrid group between the metallic and the matt. If the latter two groups are crossed, the offspring will be 100% nacreous. If both parents are nacreous then the offspring will be 50% nacreous, 25% metallic and 25% matt.

There is a third 'shine' group of scales which so far has been unidentified in this country. This is the 'net-like transparent’ which has been described by the Japanese scientist Dr Y. Matsumoto. With this scale the guanine is only partly present and therefore it does not entirely mask the pigment below as seen through the transparent parts of the scales. Hence the net-like appearance.

These three last-mentioned groups, which are caused by variation in the amount of guanine backing on the scales, are controlled by quite separate genetic factors to those affecting shape of scale, body finnage or special characteristics. Therefore in theory they could arise in conjunction with these other characteristics eventually. Only a few years ago the lionhead, celestial, bubble-eye and pouter were known only in the metallic group in this country, but now the nacreous type of each variety has appeared on our show benches.

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Readers' Queries Answered

Rainbow Fish

I have three Madagascar Rainbow fish which don't seem to be settling down in my tank very well. I think they may be being attacked by another fish because they seem to be very timid and their fins are beginning to look ragged. Could this be the cause?

It is seldom possible to completely rule out the possibility that one fish is attacking others, even if the other innocuous contents of the tank seem to preclude it. But before trying to isolate the culprit it would be worth checking to see if it is only the Rainbow fish that are looking ragged. It is really more likely that the conditions in your tank are not entirely suitable for them as their requirements are fairly specific. They require hard, slightly alkaline water and are not comfortable in acid water. This species does often show fin rot. Frequent partial water changes should help and also slight salinization of the replacement water (one teaspoon of salt per gallon) if this can be done without drastically affecting the conditions for the other tank inhabitants. They may well take a little while to settle into a new tank because they do not always take very kindly to being moved and prefer the shaded corners of the tank, seeking out the darker places away from the light, which might make them seem timid fish.

Spawning Danios

My leopard danios, when bought, were clearly a pair. The female was very rounded and seemed to be about to spawn. She lost this roundness and I took it that she was spawning had taken place and the eggs eaten by the other fishes. However, she has never become very rounded again and I don't know when to put them out for breeding.

It is possible that the male is causing the female to drop her eggs haphazardly, a few at a time, with no chance of their being fertilized. It is necessary to bring the female into breeding condition by separating her from the male and giving her a chance to develop breeding trim in a peaceful fashion. Do not forget to remove the parents as soon as the spawning is completed—they are avid egg-eaters.

Flag Cichlid Parents

I have just lost the eggs of a first spawning of flag cichlids. I am rather disappointed as I don't wish to lose the eggs separately and I thought these fish were very good parents. They have been very peaceful tank inhabitants, anyway. Will they do this continually next?

Flag cichlids are reputed to frequently eat the eggs of the first spawning, as do quite a few young cichlid parents. However, this does not usually continue and the next spawning should result in fry. The parent fish generally tend the eggs and fry carefully, but not infallibly. In PFM January 1979 Herr B. Zukal described a spawning of flag cichlids in which the usual male
female behaviour was almost reversed, with the female taking the dominant role. He also warns that "the parents do not always watch over and tend the brood as they are reputed to do."

**Unusual Catfish I**

I have just obtained a catfish by the name of *Acanthocinus pectiniformis*. I keep it at a South American catfish of the family Doradidae but I was told if you could tell me more about it. I am keeping it with large snails only and it is doing quite well. I have been told that it is quite a rare fish.

Of the Doradidae, it is the shinerndaneus genus that is more usually kept in aquaria, but talking catfish are, in any case, very popular with the pet-fish collector—they are nocturnal and likely to be rather scarce during the day. However, they are hardy and can stand a wide temperature range; 70-75°F will be entirely suitable for them. Hiding places are required for them during the time of the tank is lit. On heart is a suitable food but they will grub about and also eat some dead food and worms dropped by the owner. Their buoyant swimming and soft pectoral and dorsal spines make them well able to take care of themselves in the presence of much larger fishes.

**Unusual Catfish II**

I recently purchased a catfish 6 in. in length, which the dealer listed under the family *Clariidae*. Of course, I know nothing about the pictorial encyclopedia of aquaria, it is the family Claridae, having four pairs of barbels and being end-like in appearance. I am wondering if I have the fish *Heteropneustes fossilis* as it fits the appearance of the fish on p. 358, plate 315, of that book. Could you help me with information regarding food, temperature requirements and other facts needed for its care? I am really a fresh water fishkeeper.

If your fish resembles the photograph you quote it is not one of the Pterygopods—the Pterygopods have three pairs of barbels, a dorsal fin along the head and an adipose fin of some form or other. *Heteropneustes fossilis*, on the other hand, has a little flag-like dorsal a third of the way along the body from the head. It is a member of the Claridae family but although very like the *Clarias* genus in appearance—pellet body, flat head, large mouth—*Clarias* have the long large dorsal fin stretching over two-thirds of the way along the back. *Heteropneustes fossilis* becomes very large and can exist out of water, so that the large tank they require must be weather-proof or else suitable to be found on the floor. They tolerate a wide temperature range, but 70-75°F will be agreeable to them and water conditions are not at all critical.

Their main activity will take place at night as they are crepuscular and they could appreciate exercise provided by a nook to go over during the day. They are voracious fish and cannot, of course, be kept with fish of unequal size; they will require heavy feeding with garden worms, boiled oatmeal, pieces of raw meat and on heart, cooked fish, live guppies, dog food etc. They are very long-lived, 20-30 years is not unusual.

**Safe in the Community?**

I have been given some *Eupomacentrus bicinctus*, having been assured by the owner that they are safe in the community tank, but I am still suspicious about them. Are they safe with small species?

Yes, they are. It is, of course, rather a hazardous thing to state that even the most innocuous fish is "safe"—and hair-raising stories about the cannibalistic tendencies of a number of blood-fins recently reported to us merely confirm this—but *E. bicinctus* is known to live happily with neon, glowlites and fishes of this size.

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**THE BRITISH KOI-KEEPERS SOCIETY**

was represented at the B.A.F. by members of the Society's NORTHERN SECTION who devised, supplied and manned the very successful stand on which they had some 200 to 300, long, were displayed in an 18 ft. by 8 ft. pond, backed by wooden and a hand-painted Japanese-style mural, lit by coloured spot-lights. The stand was very popular with the public, if not with the B.A.F. organizers. The autumn meeting of the Society was held, as usual, during The Aquarist Show at the RHS Hall, London. Over 80 members enjoyed an informative slide lecture on pond construction, filtration, water-changing and the like, given by chairman Mr. E. L. Allen. The Society also staged an attractive stand with koi displayed in a pond and aquaria, and members were available for information on keeping. Membership of the British Koi-Keepers Society is £1.50 per annum. £1.75 for married couples; further details, may be obtained from the general secretary, Mrs. H. M. Aller.  

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**CLUB NEWS**

1. Anthony Close, Peterborough, PE1 3JU; phone (0733) 62997.  
2. Mr. T. Roberts of N. Staffs won the best fish in show award (K. & C. Geary trophy) at the HINCKLEY & DAS Open Show. Other trophy winners were: Buntie Sidepool trophy (Mr. D. H. Sutcliffe); Mr. P. Barnett (sud); K. & J. Hill trophy (unbelievable); Mrs. M. Muir (Hinckley); Nuneaton & Warwickshire Bdg. Soc. shield (angel fish); Mr. T. Salisbury (Bedworth); R. & M. Muir shield (sud); Mr. H. K. Hinks (Lincoln); Multi Broadcast trophy (sud only); Bedworth; Whetstone Ainsworth challenge shield (sud only); Mr. G. W. Clarke (Northants); J. Roberts Rose Bowl (sud only); Mr. J. Salisbury (Bedworth); Eddie Siminer shield (best cold-water); Mr. K. Bates (Hinckley).  

Remainder of results:

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*Contributors: 1. Mr. T. Clarke (Poulton); 2. Mr. B. Walker (Cowley); 3. Mr. G. Boardman (Northwich); 4. Ms. P. Boardman (Northwich); 5. Mr. R. Shakespeare (Bedworth); 6. Mr. W. Allen (Coldharbour); 7. Mr. J. Shakespeare (Bedworth); 8. Mr. G. W. Allen (Coldharbour); 9. Ms. P. H. Hopkins (Poulton); 10. Mr. T. Roberts of N. Staffs; 11. Mr. J. Salisbury (Bedworth); 12. Small (Bedworth); 13. Mr. W. Bell (Shrewsbury); 14. H. & H. (Trowbridge); 15. Mr. G. W. Clarke (Northants); 16. Mr. K. Bates (Hinckley); 17. Mr. T. Roberts of N. Staffs; 18. Mr. T. Roberts of N. Staffs*.  

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*Authors: 1. Mr. T. Roberts of N. Staffs; 2. Mr. J. Salisbury (Bedworth); 3. Mr. G. W. Allen (Coldharbour)*.
At a recent meeting of MID-SUSSEX AS there were two speakers and over too fish on the bench for this most important table show of the season. Members were thoroughly entertained by a very informative talk by Mr. J. Parker, who spoke about some of his home-made filters and other useful accessories. Mr. R. Forster, the ‘plant king’ spoke and showed some beautiful slides of his unique collection of aquatic plants, which certainly inspired most of his audience to make a bigger effort with their aquariums. 

Fish of the year: 1st, Mr. K. Groves (Mollienisia versicolor. 8a); 2nd, J. & B. (Pseudotropheus micropterus, 8); 3rd, C. K. Groves (Pseudotropheus trophus, 8); Novices: 1st, T. & E. Troster (75a); 2nd, E. Stanger (72b); 3rd, S. Farman (71g). Breeders: 1st, M. K. Groves (79a); 2nd, J. & B. Burrows (72a); 3rd, D. Sober (76b). Breeders: 1st, D. Sober (68, 69, 61).

The ILFORD & PA PS all-class table show drew a record number (162) of entries from club members for consideration by EBAS judge, Mr. B. Baker. The Arthur Stephenson Cup for best livebearer was won by Mr. M. Shadrack (fruity guppy). The Beaguer Namson Cup for best egg-layer was won by Mr. W. Rowan (emperor tetra). The Ilford Rose Bowl for best entry from a lady was won by Mrs. P. Read.

The Wade Cap for best furnished aquarium was won by Mr. D. Scourfield. The Junior Shield for the best entry was won by Colm O’Shea. Other results are as follows:

- Individual furnished repairs: 1st, Mr. D. Scourfield; 2nd, Mr. B. Baker; 3rd, Mr. R. Right; 4th, Mr. T. Shadrack (right back & Urania’s inhabit); 5th, Mr. S. Scourfield (right front & Urania’s inhabit); 6th, Mr. W. Rowan (topiary tetra & cardinal fish); 7th, Mr. M. Shadrack (White Cloud & cardinal fish); 8th, Mr. D. Scourfield (White Cloud & cardinal fish); 9th, Mr. M. Scourfield (White Cloud & cardinal fish); 10th, Mr. R. Right (Chinese goldfish); 11th, Mr. S. Scourfield (Chinese goldfish); 12th, Mr. W. Rowan (Chinese goldfish); 13th, Mr. M. Shadrack (White Cloud & cardinal fish); 14th, Mr. D. Scourfield (White Cloud & cardinal fish); 15th, Mr. R. Right (Chinese goldfish); 16th, Mr. S. Scourfield (Chinese goldfish); 17th, Mr. W. Rowan (Chinese goldfish); 18th, Mr. M. Shadrack (White Cloud & cardinal fish); 19th, Mr. D. Scourfield (White Cloud & cardinal fish); 20th, Mr. R. Right (Chinese goldfish); 21st, Mr. S. Scourfield (Chinese goldfish); 22nd, Mr. W. Rowan (Chinese goldfish); 23rd, Mr. M. Shadrack (White Cloud & cardinal fish); 24th, Mr. D. Scourfield (White Cloud & cardinal fish); 25th, Mr. R. Right (Chinese goldfish); 26th, Mr. S. Scourfield (Chinese goldfish); 27th, Mr. W. Rowan (Chinese goldfish); 28th, Mr. A. Scourfield (White Cloud & cardinal fish); 29th, Mr. M. Shadrack (White Cloud & cardinal fish); 30th, Mr. D. Scourfield (White Cloud & cardinal fish); 31st, Mr. R. Right (Chinese goldfish); 32nd, Mr. S. Scourfield (Chinese goldfish); 33rd, Mr. W. Rowan (Chinese goldfish); 34th, Mr. M. Shadrack (White Cloud & cardinal fish); 35th, Mr. D. Scourfield (White Cloud & cardinal fish); 36th, Mr. R. Right (Chinese goldfish); 37th, Mr. S. Scourfield (Chinese goldfish); 38th, Mr. W. Rowan (Chinese goldfish); 39th, Mr. A. Scourfield (White Cloud & cardinal fish); 40th, Mr. M. Shadrack (White Cloud & cardinal fish); 41st, Mr. D. Scourfield (White Cloud & cardinal fish); 42nd, Mr. R. Right (Chinese goldfish); 43rd, Mr. S. Scourfield (Chinese goldfish); 44th, Mr. W. Rowan (Chinese goldfish); 45th, Mr. M. Shadrack (White Cloud & cardinal fish); 46th, Mr. D. Scourfield (White Cloud & cardinal fish); 47th, Mr. R. Right (Chinese goldfish); 48th, Mr. S. Scourfield (Chinese goldfish); 49th, Mr. W. Rowan (Chinese goldfish); 50th, Mr. A. Scourfield (White Cloud & cardinal fish); 51st, Mr. M. Shadrack (White Cloud & cardinal fish); 52nd, Mr. D. Scourfield (White Cloud & cardinal fish).
at open shows." Entries at table shows have been very high and at the final show over 100 fish were exhibited. The breeding programme, launched early in the year, was spurred by so much 'moving blood.' Last year, only a dozen entries and several members have qualified for their first Breeders' Diplomas. The staging of the annual exhibition at the Liver Pool Show was memorable for many reasons. Not least amongst them, the Society being given the much coveted colouring than usual and all plans had to be hastily revised, as everyone was very grateful when the Society was awarded a Gold Medal by Liverpool Corporation, which helped make up for the disheartening experience of breaking down in a marquee literally under the ground. Many interesting meetings have taken place during the year with lectures from Mr. Abram Wood (Canada), who has been living in England for a time, Mr. I. Wool, secretary of the FNAS, Mr. Gordon Holmes and Mr. Lewis.

“GOLD FISH” won the best fish in show in the "BERTS AS Open Show. It was entered by Mr. C. Wood (Weelthorough), and was a female, the best fish, out of a record 468 entries. Sudbury AS won the points trophy. Full results are:

MR. & MRS. C. HARDING were very successful at the CARDIFF AS Open Show, winning the award for Best Coldwater, Most Points and Most Points Cardiff Member. Mr. M. L. Loveland was the award for Best Tropical in Show. An account of the rest of the results are as follows (FRAS class letters):

One hundred and fifty-one competitors from 32 societies gave BARNWELL TFS a personal record of 707 entries at their 35th Open Show. The best fish in show trophy was won by a guppy shown by Mr. & Mrs. Marshall of 417.

OVER 400 entries were received for the IRISH TROPICAL FISH SOCIETY's Annual Open Show held at the Mansion House, Dublin. Mr. W. Pollock of Belfast received the award for best fish in show. Results were:

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WHEN HASTINGS & ST LEONARDS AS held their inter-club show, the winners, TONBRIDGE AS, were winners with 1330 points to 1320. Results were:

Employer's show: 1, Mr P. Stanley (Hastings); 2, Mr J. Adams (Hastings); 3, Mrs J. Adams (Hastings). 
Pot: 1, Mrs R. Parsons (Tonbridge); 2, Mrs J. Adams (Tonbridge); 3, Mrs J. Adams (Hastings & St Leonards). 
Open: 1, Mr D. Parsons (Tonbridge); 2, Mrs R. Parsons (Tonbridge); 3, Mrs J. Adams (Hastings & St Leonards).

FEDERATION Retirement of General Secretary

Mr Ken Pye at AGM

THE Annual General Meeting of the FBAS was held at the beginning of December and a large attendance witnessed the retirement of long-serving general secretary Mr Ken Pye. He was first elected to the Council in 1958, and became Assistant Secretary in 1958 and secretary in 1960, thus making a total of 17 years' service on the Council. As a token of appreciation of the members, the Federation's chairman, Mr Frank Tomkins, presented him with a cut-glass decanter and glass set. Other retiring officers were Mr Maurice Carter, who had been a very successful publications secretary, and Mr Stan Aplin. The Council for 1974 is: chairman, Mr F. C. Tomkins; vice-chairman, Mr L. Jordan; general secretary, Mr H. Parrish (18 The Barons, St Margaret's, Twickenham, Middlesex, T30 2AP); assistant secretary, Mr P. Lambourne; treasurer, Mr R. Dove; chairmen, Judges and Standards Committee, Mr R. Jenson; secretary, Judges and Standards, Mr C. A. T. Brown; Council members, Mrs S. Hodges and Mr A. Blake; Mr P. Cotter, Mr T. Gass, Mr D. Lambourne, Mr R. Mills and Mr A. Tuffs.

On the recommendation of the Judges and Standards Committee, it was agreed that all B class judges of the FBAS be made available for open shows, owing to the fact that there had been so many open shows during 1973 and the future problems that were likely to arise from the fuel crisis.

To combat the ever-increasing pressures of inflation, which were hitting hard into administration costs, it was agreed that the new minimum affiliation fee should be £2.00, the first increase for many, many years. It has been estimated that the cost of published material for societies, and other communications, runs out at £1.90 per Society per annum.

Despite the trials and tribulations of the present times, the Federation has had the privilege of receiving over 150 enrolments to its membership during 1973. It was felt that this was a very satisfactory performance, and the hope was expressed that the 200 barrier will be surpassed during 1974.

A further publication of National Show Standards and an increase in titles of tape and slide lectures auger well for the expansion of the services of the Federation. Societies thinking of taking advantage of the facilities of the FBAS should write to the general secretary, Mr H. Parrish, at 18 The Barons, St Margaret's, Twickenham, Middlesex.

The Federation wishes all its Members a happy and successful New Year.

PROVISIONAL plans for the AGM of the BRITISH CICHLID ASSOCIATION see that it will possibly be held in the Midlands in late March or early April. The association also intends to support a number of Open Shows and Exhibitions during the coming year with particular emphasis on providing information to hobbyists and members of the public. The new general secretary of the Association is Mr Tony B. Acock, 18 Rosary Close, Hounslow West, Middlesex.
and any livebearers, classes and Mr J. Brooks in that for mollies.

BEST fish in show at the NEWCASTLE GUPPY & LIVEBEARER SOCIETY'S recent meeting was won by Mr B. Edwards. Best guppy and best livebearer were entered by Mr P. Wright; Independent smoothtail trophy (FBAS) and Benton trophy (not livebearer) were won by Mr & Mrs Coates; WallSEND aquatics trophy (breeding pairs, guppy), Mr Ryan; Robinson trophy (male mollies), Mr Fortune; three matched male guppy trophies, Mr D. Penney; breeding pairs livebearer trophy, Mr R. Lawson and breeders class guppy trophy, Mr J. Lawler. Remaining results:

Male guppy: Mr P. Wright, 3rd, Mr R. Lawson, 2nd, Mr J. Lawler, 1st; Mr D. Penney, 4th; Mr D. Penney, 5th; Mr D. Penney, 6th; Mr D. Penney, 7th.

Female guppy: Mr D. Penney, 1st; Mr D. Penney, 2nd; Mr D. Penney, 3rd; Mr D. Penney, 4th; Mr D. Penney, 5th; Mr D. Penney, 6th; Mr D. Penney, 7th.

Male mollies: Mr C. Penman, 1st; Mr C. Penman, 2nd; Mr C. Penman, 3rd; Mr C. Penman, 4th; Mr C. Penman, 5th; Mr C. Penman, 6th; Mr C. Penman, 7th.

Female mollies: Mr C. Penman, 1st; Mr C. Penman, 2nd; Mr C. Penman, 3rd; Mr C. Penman, 4th; Mr C. Penman, 5th; Mr C. Penman, 6th; Mr C. Penman, 7th.

Pearson's: Mr C. Penman, 1st; Mr C. Penman, 2nd; Mr C. Penman, 3rd; Mr C. Penman, 4th; Mr C. Penman, 5th; Mr C. Penman, 6th; Mr C. Penman, 7th.

In Brief . . .

...AT the last inter-club meeting of 1973 LANTWIT MAJOR was back for 29 points to 0. Throughout the year the Society competed in seven inter-club competitions, winning five and losing two. All members are determined to average the one outstanding defeat by Barry AS on the return match in 1974.

...A NEW Society has been formed in the Bristol area—this is NAILSEA & DAS. For details of meetings contact the Secretary, Mr J. Effie (75 Harewood Grove, Nailshe: telephone Nailshe 4535).

HELLMEL HEMPELD AS has won the 12.5-a-side Challenge Competition against Welwyn Garden City AS by 897 points to 885.

THE BIRMINGHAM SECTION of the FGA extend congratulations to Mr J. Matthews for winning his first silver card and to Mr R. Jones for gaining his fifth, which qualifies him for his silver pin guppy. The Section had an early and depressing discussion in November on the effect of the petrol crisis on meetings of an Association such as theirs whose members are so widely spread throughout the country.

...AT THE BRITISH AQUARISTS STUDY SOCIETY AGM a talk on the fishes of the Crater Lakes of the West Cameroons was given by Dr E. Trewavas. This eminent speaker—a world-acknowledged authority on African fishes—illuminated her excellent talk by slides of her own field research conducted in the region 3 years ago. The lecture was followed by a panel of experts (Dr Trewavas, Dr Greenwood, Dr G. Vevera and Mr H. I.  

THE EAST LONDON AQUARIUM & PONDKEEPERS ASSOCIATION's annual open show was a highly successful event with a total of 246 entries. One of the highlights of the show was the furnished aquaria which alone gained 20 entries; most important was the fact that all fish entries were of high standard. Winners of both club and open trophies are: the I.G.A.T. trophy, Lymington AS; Merina Tropics, Mr J. Logie; the Arrow trophy, Mr J. Boss; the Grass, Mr R. Wrightson; T. J. Roes Memorial trophy, Mr K. Pachuck (Hendon); T. J. Roes trophy, Mr P. Wright; the Aquilla trophy, Mr W. Corby; the Polyglot trophy, Mr J. Logie; the J. & P. Tooling trophy, Mr P. Vicker; the Angelfish trophy, Mr M. Pearson; the G. Green trophy, Mr W. Corby; Gold Pin, Mr W. Corby; Five-Star Cup, Mr W. Corby; Breeder's Achievement Cup, Mr M. Pearson; Creeds Cup, Mr J. Boss; FRAS shield, Mr W. Corby; mini-furnished Cup, Mr K. Wrightson; individual furnished trophy, Mrs J. Jones; Olympic Cup, Mr J. Linde; Manor trophy, Mr K. Wrightson; Home-furnished trophy, Mr K. K. Baker; Tropical Cup (for table aquaria), Mr M. Pearson; Three-Star junior trophy and Gill junior trophy, Mr S. Pasco. Remainder of results:
Aylott) answering questions on a variety of subjects put by members of the audience of over 80 people. The day was completed for members by the annual dinner in the Tavern Room. The next meeting of the society will be held at the London Zoo on 16th March and will form the basis of a Symposium on Labyrinth Fishes. The main speaker will be Professor McNeil Alexander.

... THE slide lecture on catfish given by Mr D. Noble to BRISTOL AS stimulated a great deal of interest among members and provoked a good discussion during the question time.

... WINNER of the Cup as Aquarist of the Year at BRACKNELL AS was Mr J. Horsley, who also received the Cup for Novices with the highest number of points. Mr L. Little received the Cup for the highest number of points in the specialist class and also for the senior class.

... BRIGHTON & SOUTHERN AS are holding their AGM on 25th January. The Fish of the Year show was judged by Mr C. Cochrin who then went on to give an impromptu talk on the dose and don'ts of fish showing. The Society hopes to have their own fish-showing stand soon which should ease the edgers' task at future table shows.

... WINNERS of the garden pond competition at HASTINGS & ST LEONARDS AS are 1. Mrs O. Pollard; 2. Mr C. Reed; 3. Mr. A. L. McCormick. The Home Aquaria Competition was won by Mrs E. Reed (1st), Mr. C. Pollard; 2nd Mr H. Carey). Best plants, Mrs E. Reed; best junior, Andrew Reed. Members were disappointed at not seeing slides of the winning entries because of the Kodak strike. A talk by Mr R. Sankey on tropical marine keeping has also been greatly enjoyed.

... THE BRITISH CICHLID ASSOCIATION (NORTHERN AREA) are holding their third meeting in the Half Moon Inn, Gateshead at 8.30 p.m. on the 13th January, 1974. All members and any wish to join the BCA are welcome. Further details from Mr A. Kitchin, 27 Longacre, Houghton-le-Spring, Co. Durham, DH4 3PT.

... WHEN BARRY AS won the £100 Inter-Club Zone knockout competition against Lar Won Major AS they were victorious by 12 points to 8. The best fish award was made to an all-time tiger barb entered by Mr Glover (H. L. M.). The berry man achieving most points was Mr K. Thomas.

... A NEW society, PETERSFIELD & DAS, has been formed. Meetings are held at 7.45 p.m. on alternate Tuesdays, the Garden Room, High Street, Petworth. Details from the secretary, Mrs J. M. Upton, 56, The Causeway, Petworth, Hants, GU31 45B; phone Petworth 4553.

... NEW FOREST AS have decided to withdraw from the three-club Inter-Club Competition. Table shows will still be arranged with the clubs concerned but not on a league basis. A former club member Mr G. Derby gave a very interesting show of coloured slides on setting up and servicing a furnished aquarium.

... Mr. W. A. Nixon won 1st, 2nd and 3rd places in the barbs class of a very well supported table show with the white barb full of fish. Mr. D. Harding won in the platy class.

... ONCE again Mr R. Davies of WATERBURY & DAS very kindly substituted for an absent speaker. He explained, to a good turnout of members, the show rules of the Society. There were quite a few new members and they found it extremely helpful to their new-found hobby. Mr. J. R. R. Jones won 1st & 3rd in the cichlid class A in the table show and 1st, 2nd & 3rd in the rasbora class. The best fish in show was a Cobus johnsoni entered by Mrs. J. Johnson (notice a.v.), and Mr. R. L. Low won in the cichlid class B.

... THE FANCY GUPPY ASSOCIATION was once again represented at the BAF by a stand put up on the MANCHESTER section. It attracted great interest and also some of the prizes, notably first three places in the single guppy class, 1st & 3rd in pairs livebearers and 1 & 2 in the society furnished—a very worthwhile effort for all the work put in by the members. If anyone would like to join this hand of keen guppy addicts, the venue is Longsight Hotel, near entrance to Belle Vue, on 2nd Sunday in month commencing 2.30 p.m.

... Dates for Your Diary

- 11th March: CARP FISHERS ASSOCIATION at the Royal York Hotel, York, 9am-1pm. Speaker: Mr. J. M. Smith. Details from Mr. J. M. Smith, 31a St. James's Street, York, YO1 9BD.
- 25th March: CARP FISHERS ASSOCIATION at the Royal York Hotel, York, 9am-1pm. Speaker: Mr. J. M. Smith. Details from Mr. J. M. Smith, 31a St. James's Street, York, YO1 9BD.
- 1st April: NELSON AS Open Show, Civic Centre, Station Street, Nelson, Lancs. Details: Mr. H. B. Jones, 22 Beresford Road, Coburn, Lancs.
- 11th April: RIVERDALE AS Open Show at the Victoria Hotel, Ingleby Barwick, North Yorkshire. Details: Mr. J. M. F. Smith, 31a St. James's Street, York, YO1 9BD.
- 11th April: EVERTON AS Open Show at the Victoria Hotel, Ingleby Barwick, North Yorkshire. Details: Mr. J. M. F. Smith, 31a St. James's Street, York, YO1 9BD.
- 11th April: BIRKHAMPTON AS Open Show at the Victoria Hotel, Ingleby Barwick, North Yorkshire. Details: Mr. J. M. F. Smith, 31a St. James's Street, York, YO1 9BD.
- 11th April: COVENTRY POOL & AQUARIUM SOCIETY Open Show at the Victoria Hotel, Ingleby Barwick, North Yorkshire. Details: Mr. J. M. F. Smith, 31a St. James's Street, York, YO1 9BD.
- 11th April: ALFRETON & DAS Open Show, the Victoria Hotel, Ingleby Barwick, North Yorkshire. Details: Mr. J. M. F. Smith, 31a St. James's Street, York, YO1 9BD.
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