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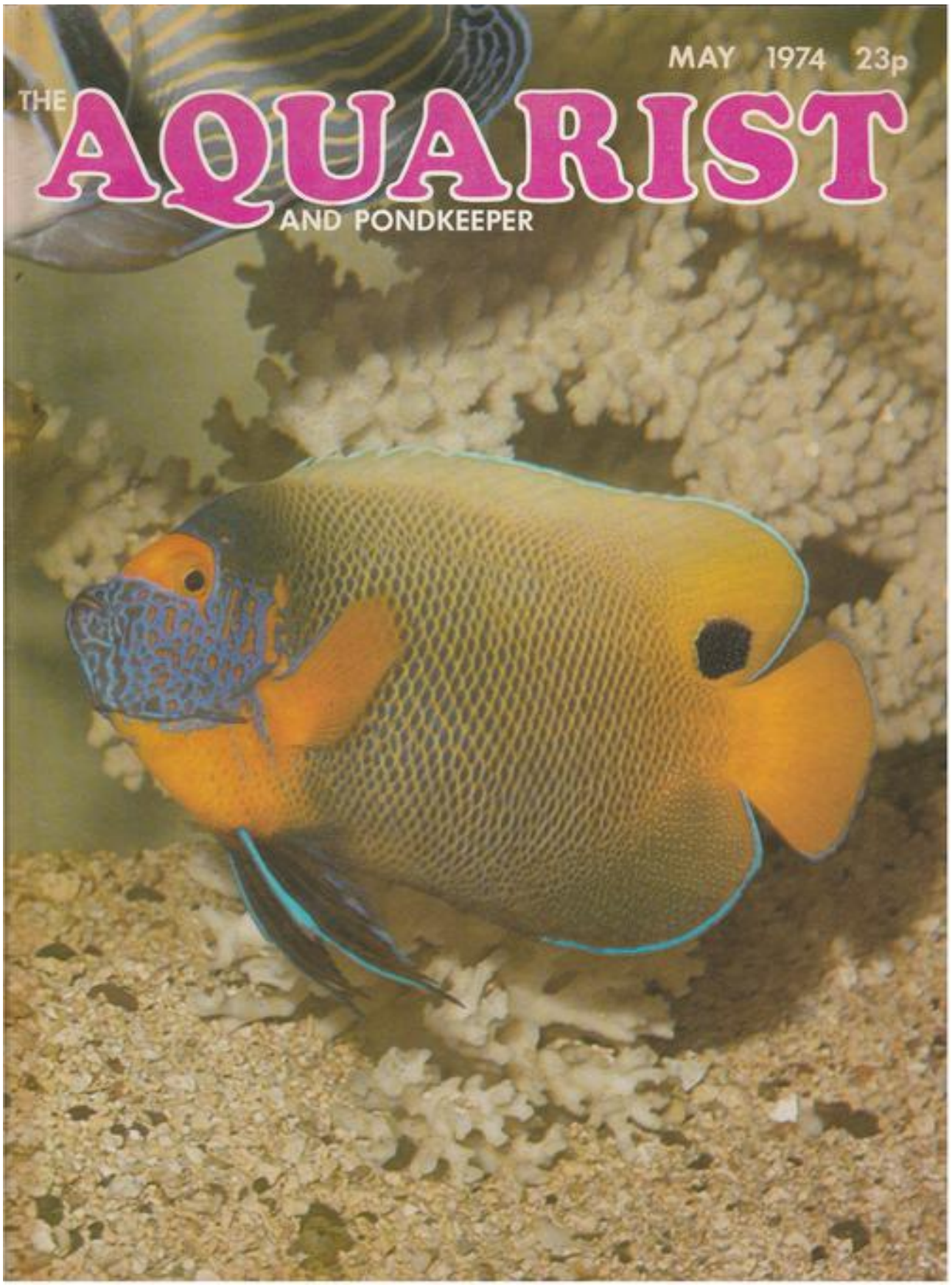
THE AQUARIST AND PONDKEEPER



THE AQUARIST AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

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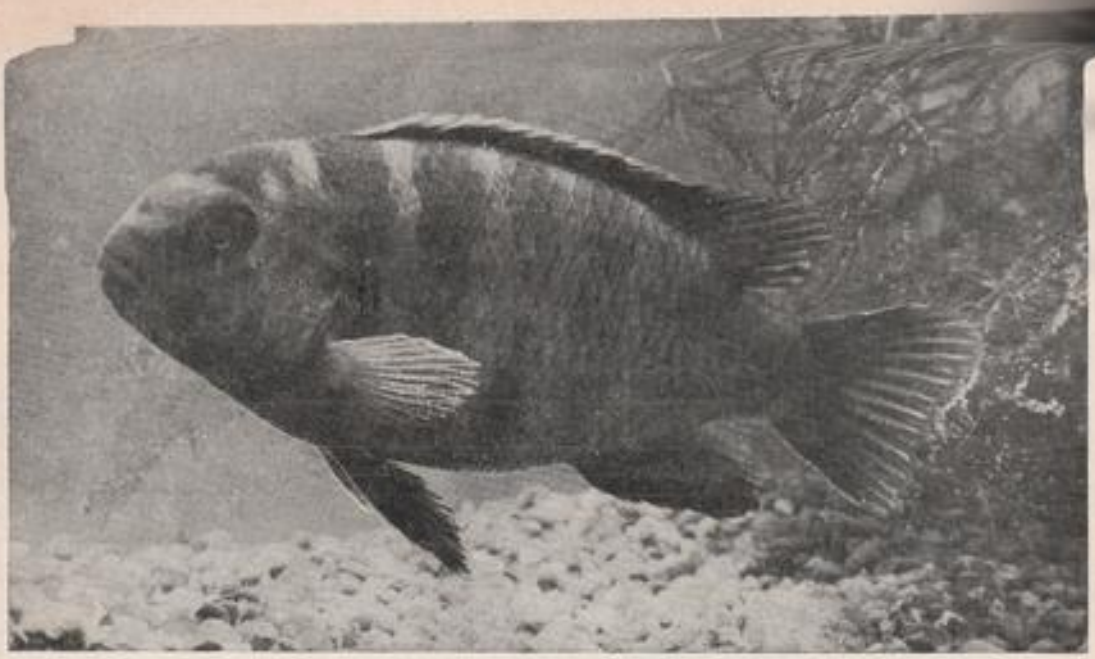


KEEPING MALAWI CICHLIDS

Pseudotropheus fuscus

by David J. Saphier

I ORIGINALLY BOUGHT these fish as a pair of a similar fish, namely *P. zebra*. However, despite this initial mistake, these fish turned out to be one of my most interesting, and successful, that I have had the fortune to own. Normally they would have cost me £7·00 for the pair but I managed to make a deal with the shop owner—I swopped a pair of *Aequidens awani* with ten of their young and also three *Haplochromis burtoni* for the *fuscus* or *zebra*. They were the only pair that he had had in stock. They had been in the same tank for about 7 months, along with about 15 other Malawis, including a rather beautiful white version of *P. zebra* reputed to be worth in excess of £15. I have never again seen these fish for sale and when advertised, they have been £12-£15 or more—so, I think that I was very lucky indeed to get these so cheaply!

When I bought them, I put them in my 48 in. × 15 in. × 12 in. cichlid community tank along with a male *P. auratus*, 5 small assorted *P. tropheops*, some *P. novemfasciatus* and a pair of *Labeotropheus fuelleborni*. They settled in quite quickly and ate almost

non-stop. 6 days later I noticed that the female had her ovipositor showing and the male was, very calmly, digging a nest. He also cleaned up a large piece of slate that was next to his dug-out. He did this by pulling of, with his mouth, any bits of detritus on the slate and after removing all visible dirt, he rubbed his belly over the cleaned surface in order to make quite sure that it was absolutely clean.

That day and the next they started to spawn literally dozens of times but were attacked each time by a very large *Hypostomus* whose abode was underneath the nuptial slate and who did not like his beauty sleep being disturbed—and did he need that beauty sleep! However, on the 12th of August, they at last got the message and went off to spawn elsewhere whilst I wasn't looking. The female was immediately removed and put on her own, in a 24 in. × 12 in. × 12 in. tank. The water conditions were the same here as in the spawning tank—80°F. pH 7·4 and both were below south facing windows with no artificial light. After only 18 days of brooding she let them all go free. It was a truly amazing sight—60 plus little brown blobs swimming about their mother. I took the hungry female out and put her in a tank on her own. I then put my father in charge of all my fish and went away for the week. When I came back I found that they had mostly doubled their size and were all about ¾ in. in length. They had brown vertical stripes all over their bodies and were generally of an overall brown colouration.

The next time that they spawned successfully (having spawned unsuccessfully once before) was on the 5th of December (1972), and, after 21 days of a very bulgy incubation, the female released 75 ¼ in. long fry which, as far as I know, is a record number for this species.

After a further three weeks, the fry were ½ in. long and were growing steadily, so that they had reached a length of 1½ in. after a further nine weeks or, when they were just 12 weeks old. To get them to this sort of size in this sort of time, I had to feed them on foods high in protein such as dried commercial foods, *Tubifex*, Brine-shrimp (*Artemia*), *Algae* (costs nothing!) dog meats and peas!

To get the highest rate of growth, I find that they must be fed at least five times every day and, if possible, eight or even ten times. BUT, these feeds must not be too big or else you will have trouble.

If you are now beginning to wonder just what colour the fish is, look at the side-on-view photograph: the fish (this is the male) has a light blue body with five or six darker stripes down its body. The fins are a dark blue colour and on the end of the anal fin there are just visible two egg spots, these become much yellower than they appear to be here during spawning. The female was of a very muddy brown, rather nondescript, colouration. It is interesting to see the rather small, downward-pointing, mouth. The head was quite large and both male and female (the male to a lesser extent) had a slight frontal gibbosity, or swelling, on their foreheads in a similar manner to the very rare *Cyphotilapia frontosa*—but to a much lesser extent.

If it is something different that you are after, then this is a fish that can easily satisfy your needs. Its habits are so different from those of other fish that it can hardly fail to please. For maximum success however, there are, I think, a few imperative requirements:—

1. They MUST be fed well, often and with a lot of variation.
2. It is best if they are kept with others, of the same type in a community tank.
3. The young must have a lot of space to grow in and must be culled regularly.

So, it is a fish well worth trying, even if the initial expense is high—which it is!—up to £10·00 for a 4 in. or 5 in. pair. Mine were the equivalent of £7·00 but this has been doubly repaid on the sale of a few dozen fish. It can, therefore, be both enjoyable and profitable.

Incidentally, I have just (8th July) had a spawning of my first generation of youngsters. The male and female being 3 in. and 2½ in. respectively! From this spawning I obtained nine fry, released on the 24th July.

"I find that guppies like 'pop', angels something classical and platies go for ballet."

VIEWPOINT

by A. Jenno

For those interested in the use of ozonisers, either in combination with protein skimmers or otherwise, an interesting leaflet is available (on receipt of a s.a.e.) from Shirley Aquatics Ltd. It is entitled "Information and technical instructions for aquarium keepers concerning the use of ozone," and deals thoroughly with the application of the subject matter to aquaria, the relevant background theory and provides easily understandable layout diagrams. The text is an accumulation of the German manufacturer's instructions and Mr. Roe's own practical experiences, and while those parts which are translated from the German do appear to suffer slightly, this does not in any way detract from the value of the information given and so the serious aquarist will find it a most beneficial publication. Several important points are detailed, for instance the use of preliminary air-dryers, the inclusion of a foam sieve in the protein skimmers, and the beneficial effect of ozone on wounded imported fishes. Suggested rates of injection for various applications in terms of milligrams-hour-gallon are also given.

One point which should always be considered by those using an ozoniser for the first time is that only certain air pumps appear to be suitable for providing the air input. Piston pumps which allow oil to leak into the air supply are inconvenient due to the resulting contamination in the internal parts of the ozoniser unless very thorough oil filtering is provided, and it also appears that ozone has serious effects on the rubber parts of diaphragm pumps. Perhaps the answer to this last problem would be to use a long length of air tubing between the pump and the ozoniser so as to minimise effects, although as the air pump operates before the ozoniser anyway, it should not be actually pumping ozonised air. Only one pump (the Wisa) advertises an ozone resistant diaphragm to my knowledge, so do we assume that others have this property or not? Also, what about the rubber flap valves?

The use of wood for decoration in aquaria has always been a controversial matter, its success or otherwise having been dependent in the past upon whether the type of wood obtained and its condition, would allow permanent immersion in an aquarium without an eventual polluting reaction. Experiments now, however, tend to show that any nicely shaped piece can be used for decoration if it is first completely sealed up with marine-grade polyurethane varnish. Brushing or even spraying are not really good enough methods of application for most pieces, a better method being to simply pour the varnish over the wood so that it runs into all the cracks and crannies and makes a really good seal. An even better method would probably be complete immersion, although this might prove expensive for large pieces. Several coats should be given and a long hardening period allowed (say a month) before use. An acquaintance has had a piece in a decorative freshwater environment for ten months now without any toxic effects. Whether the fact that the varnish is sold as marine-grade for boat building purposes would allow it to stand immersion in a saltwater environment indefinitely is another matter entirely and would warrant further experiments. Normally this kind of dabbling is not worthwhile, but the effect of nice pieces of wood in aquaria is so pleasing that it can be recommended. *Algae* seems to grow well on the varnished surfaces to increase the decorative effect, but whether this might eventually break down the seal by its growth processes poses a further query. Periodic washing to remove the *algae* might prove advisable.

A current breeding programme to produce livebearers in reasonable quantities has given rise to several interesting theories. One of these concerns the idea, often accepted as gospel, that livebearers do not eat any, or very many, of their young if kept well fed, and this appears to be most questionable. Invariably in my experience, if a gravid female is brought from, say, a shop where she has lived for some time in a crowded, poorly fed situation, and then drops the young within a few days afterwards, the whole brood, certainly the majority, will survive. On the other hand, once the females have become accustomed to a good diet and frequent feeding they seem to acquire an ever-present ravenous appetite as a direct result of this improved diet and then, on giving birth, will go to enormous lengths to search out and eat every last newborn fry, even when other food is present in the aquarium. This is particularly noticeable with platies and mollies kept on a diet of mainly liver, peas and whiteworm, supplemented with good flake food and other items as available. This diet would seem more than adequate as the rate of growth and condition of both the adults and the resulting fry is extremely good. The fishes are all fed four times daily and the fry receive brine shrimp as well, but the fact remains that due to this apparently increased appetite the fry are hard to come by, even in tanks with reasonable plant cover. The male fishes, if present at the birth, are equally enthusiastic.

Inevitably, the only practical solution to the above problem seemed to be the confinement of the females in breeding traps if maximum broods were to be obtained. Not being a devotee of this method, some careful thought was given to its application before anything was actually done. The main disadvantages

Continued on page 50

MARINE QUERIES

by Graham F. Cox

Have you anything to cure nitrites. A friend's tank (6ft.) has been set up for only two months and yet the test water sample remains constantly red. Most of his fish have died and he has replaced with others and again he is still losing them. This is not caused through the usual overfeeding, etc., and he has been advised from where he gets the fish to take the whole tank down and start again. This, of course, he is loathe to do. I wondered if there was something new that would remedy this.

To reduce nitrite level:

(1) Ensure that turnover rate (by U/G filter airlifts) is *at least one hour*; i.e. all water passes through gravel every sixty minutes. However this is a *minimum turnover rate*, and whereas it is satisfactory once bacterial maturation has occurred, whilst ever a nitrite reading persists the turnover rate should be 15 minutes or so.
Example: Say dimensions of your friend's tank are 6ft. × 18in. × 24in. = 110 gallons and has an allover fitting U/G filter with two airlifts. Therefore, to give a 15 minute T/O rate all the water would have to pass through the filter gravel 4 times in one hour; i.e. 4 × 110 gallons—440 gallons per hour would have to be pumped by the two airlifts *or* in other words, each airlift would have to be working at the rate of 220 gallons/hour. A turnover rate of this magnitude would require two airlifts of 2in. diameter operated by powerful pumps.

Of additional assistance in the maturation, i.e. in addition to a high turnover rate, are the following:

(1) *Temperature* should be 75°F, as this is the optimum temperature for bacterial activity.
(2) *Oxygen Tension* of the water should be high, in fact near saturation. Fierce aeration through wooden diffusers will be of great assistance in raising the water's oxygen tension. Pumice-stone diffusers are not a great deal of use in saltwater as they provide bubbles which are too coarse, and soon become clogged up with salt.
(3) "*Seeding-up*" a new marine aquarium with a few cupfuls of matured gravel from an established aquarium speeds up the rate at which the vital nitrifying bacteria colonise the filter gravel.
(4) *Coral sand* is a porous calcareous coralline rock broken up by wave action into small granules. This material, coming from the sea, is heavily impregnated with nitrifying bacteria of all types in the latent spore stage, and soon speeds up nitrification. Ideally, it should be mixed in with silica gravel to prevent an ionic imbalance in the aquarium seawater. In addition, 3-4 monthly 25 per cent water changes will be necessary to ensure magnesium ion replacement.
(5) *The pH* of your seawater should be normal at around pH 8·0 to 8·3. It is vital that the pH of seawater shouldn't be too high since the toxicity of *AMMONIA* (which is giving rise to your nitrite reading) becomes much greater at high pH readings.
(6) *Specific gravity* of the seawater should be low, say 1·020 at 78°F.

The worst thing your friend could do would be to strip down the tank and start again. This would almost certainly result in his partially-matured gravel being completely sterilized and would lead to a further long period of maturation. Partial water changes of up to 25 per cent would reduce the nitrite reading temporarily, but it (the nitrite content) will all disappear soon anyway as the gravel matures bacteriologically.

Finally, might I suggest that you remove all decor materials of marine origin, e.g. shells, corals, gorgonian skeletons, sea-fans, etc., etc., and smell each piece individually. Any incorrectly cured items will soon betray their presence by a particularly foul stench and should be bleached for 4-5 days, and then thoroughly washed before returning to the aquarium.

A POND FOR KOI

by Witold S. Zaczeniuk

Environment

In every pond whether small or large, apart from the fishes and plants, there is also life of perfectly adapted water organisms. All these organisms are dependent on each other, and the variety and quantity of water life depends again on the physical, chemical and biochemical actions which constantly take place in the particular environment. The ecological factors which influence the type of life in a given environment are many, but the most important are the following:— light; temperature; movement of water; air circulation; gases dissolved in the water and in the atmosphere; water and its character; pH value; mineral salts; and solid matter suspended in the water; type of construction of the pond and its shape, depth and the material from which it has been made; hardness of water; the type of plants grown in this environment; and also biological factors which indicate the sort of relation between living organisms; whether they serve as a food to other organisms, or whether they are simply competitors in search of the same food, or whether they are enemies, e.g., parasites. It could be said that each pond should be treated as a completely different environment, containing therefore different water organisms in different quantities which are able to live only in these conditions. Thus the pond is a sort of living organism of a complex and higher character.

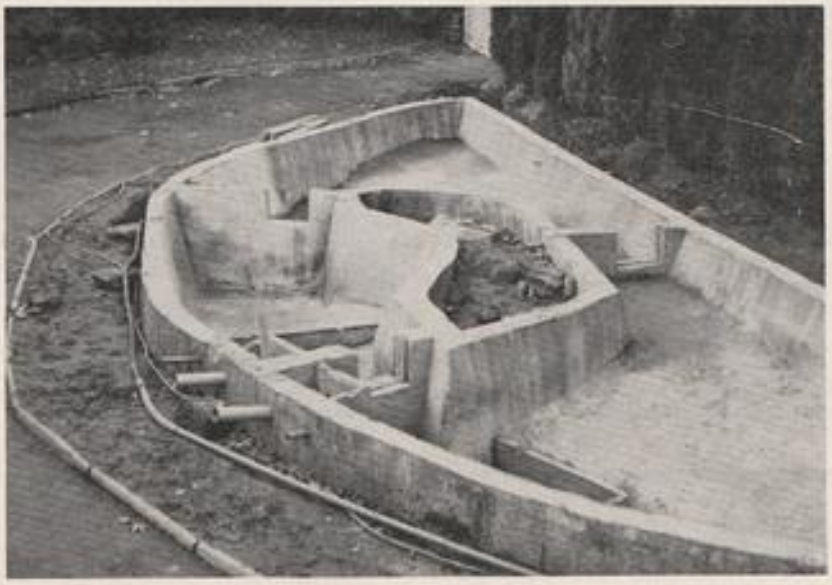
A well constructed pond is a type of container where this interdependence of organisms is particularly clearly visible. The balance of life in the pond can easily be disturbed by overcrowding through the introduction of extra good sized fish, or by carelessly putting in extra food. Therefore it is most important for the Koi keeper to be aware of the existence of life in his pond, and at the same time to know how to prevent disturbance and destruction of the balance, and also how to rectify the faults.

Koi belong to the family of fish which really need large lakes in which to live, but because of their ornamental value we decided to give them almost a miniature environment so that we can enjoy their beauty and grace. Their real requirements are different from those which we are offering to goldfish. For this reason I feel that Koi have to be compensated by the introduction of several changes which are not normally required in the keeping of shubunkins or golden orfe. First of all the introduction of some kind of filtration and oxygenation of the water in the pond is essential. Koi are great eaters at the temperatures 20°C to 29°C. They belong to the family of fish which have a remarkably large appetite. Of course with this also goes their growth. A large part of the taken food, goes, after being digested, into waste. A small pond with large fish in it soon resembles thick pea soup, and for this reason I strongly recommend filtration.

My Koi Ponds

In my ponds I have three types of filtration. One consists of filtering water through foam rubber, another is under gravel filtration, and the third one is Koshihara filtration. After four years of constant experimenting and changing my filtration system, I can now safely advise the last two types as a must for any garden pond with Koi. To maintain the proper oxygen content in your pond is also very important. Absorption of oxygen from the air is very slow, and can only take

place through the surface of the water. For this reason constant movement of the water from the deepest part of the pond, with the aid of pumps, is essential. However, the main source of oxygen in the pond comes from the oxygenating plants which absorb carbon dioxide from the water during the day, at the same time giving back oxygen to the water. During the night the process is reversed. The supply of oxygen, in normal conditions, is three times greater than the absorption of oxygen from the air through the surface of the water. From my own experience I have found that the only plants which can survive for any length of time in a pond containing adult Koi, 13 in. to 18 in. in length, are water lilies. All other plants have no chance of lasting longer than a few days. So, if you get rid of plants which are so effectively supplying oxygen, then the only method of compensating for the loss would be through a waterfall or fountain running constantly. It is preferable to run it through the night when the oxygen content is at its lowest, rather than during the day, as practised by some Koi keepers. This is very important during the summer days when the water temperatures are high and the demand for oxygen is thus much greater. Plants and animals living in the pond are constantly using the oxygen. The best indicators of the reduction of oxygen in your pond are the fish themselves, especially in the early hours of the morning, when in a critical situation they usually gather at the surface of the pond and take oxygen practically from the air. Koi belong to the family of fish which require 7 to 14·5 mg/l of oxygen. When the fish are at the surface of the water there is usually 3 mg/l or less oxygen in the pond. The Koshihara filter is a really good investment in every pond because not only does it remove a lot of dirt but it also provides a sort of compulsory part change of the water in the pond. I am not an advocate of constantly running tap water through the pond as some Koi enthusiasts practise, although they claim that it does work for them. Personally I have my reservations. Apart from extra water changes, there must always be the danger of killing the Koi (there is always some amount of chlorine in tap water), I just cannot see how one can find any natural food in that sort of environment. The ideal pond is, in my opinion, one which can supply natural food for the fish to the value of at least 50% of their normal requirements. Plankton has no chance of survival in a constantly changing environment, and for these reasons alone you cannot successfully spawn your fish or bring up young fry.



Koi pond under construction showing island and three separate compartments which can be isolated from each other by water-tight gates.

One of the most revolutionary modifications which I made to my goldfish pond some three years ago was that of dividing the pond into three parts making three completely separate small ponds, each being isolated from the other by water-tight gates and thus enabling me to drain the pond for cleaning purposes in parts, or to separate the fish at my will in a matter of seconds. Actually, in the last two years I do not remember even one occasion when I had to catch my Koi in the net for the purposes of inspection or

treatment. There are so many benefits of that arrangement that I am really surprised that this idea for the Koi pond is not catching on as quickly and enthusiastically as I would have expected. Perhaps the cost and labour involved is the main consideration with some Koi keepers. However, I think this is a matter for consideration by the garden pond enthusiasts as it has many real benefits.

1. The fish can be quickly and easily separated and treated right in the pond without the necessity of netting them, especially when they are weak and distressed.
2. The pond can be cleaned in stages without removing the Koi into special containers.
3. The spawners can be easily separated either before or after spawning.
4. It is easy to produce the ideal conditions for the rearing of young fry which need a lot of space, and also some amount of natural food for growth in the early stages of development.
5. One part of the pond can also be used at times for maturing tap water for the purpose of replenishing the water which you discharge from the pond with the dirt when you operate Koshihara filters.
6. Periodic draining of even parts of the pond and leaving dry for a day or two helps in the effective reduction of parasites, especially with the invasion of Carp louse called *Argulus*.
7. This arrangement also gives you a chance to do any repairs to the pond or equipment.

Of course, there must also be some disadvantages which again depend largely on each individual pond-keeper's situation. I do know that there are many very attractive ponds made with the aid of plastic liners, and I simply don't know whether these could easily be adapted and modified to meet other considerations. Maybe some of the readers are not interested in spawning Koi and breeding them, or perhaps some of them feel that my considerations are not as important to them as I try to make out. Well, some six years ago, when I started thinking about building my pond, my first consideration was cost and labour—actually I just wanted a very nice pond. Now I believe that Koi ponds must, in the first instance be functional, and if one has a bit of imagination and taste the second consideration, that of beauty, can be achieved to some degree. I always think first of fulfilling the Koi's requirements and wellbeing. They are beautiful enough themselves to attract anyone's attention providing they can be seen swimming happily in your pond. At the moment I am again using a concrete construction to build a new pond in a half-moon shape, some 260 sq. ft. in surface area, with a large island in the middle. This pond will also be divided into three parts of 110, 100 and 50 sq. ft each. It will have three under gravel filters approximately 80 sq. ft. in total area, plus three Koshihara filters. All the filters will be able to work independently of each other, or together as one unit if required. A waterfall and fountains will also be incorporated in this new pond. The second consideration—that of beauty—well I'm aiming at a pond which will at least resemble a Japanese pond with plenty of rocks, dwarf conifers and perhaps a few azaleas and some attractive Japanese tree in the middle.

From a Naturalist's Notebook

by Eric Hardy

OBSERVATIONS on sea-anemones from Anglesey's Church Bay rock-pools in Liverpool University tanks, enabled A. J. Cain recently to observe the common terrestrial beadlet sea-anemone *Actinia equina* liberate its planula *larvae* into the plankton, like many other sea-anemones. But then they entered individuals of the same species, male or female, where they were nursed in the coelenteron and eventually ejected as juveniles of various sizes, male or female. This anemone varies in colour from red to orange brown, green or blue green, dotted or striped with yellow, depending upon carotenoid in its diet, the juveniles showing the same colour characteristics of the adults.

This animal is named from a circle of bright blue, bead-like swellings (concentrated sting cells) conspicuously circling the base of its tentacles. It used to be called *A. mesembryanthemon* and even grew on the Perch Rock in the Mersey estuary, usually its dark red form which one finds at low tide down the deep tidal-guage cut in the rock at low water at the seaward end of Cheshire's Hilbre Island, where a large boulder enables one to climb down to where it hangs beneath the ledges on the rock walls.

The newly-published 2nd edition of Dr. T. T. Macan's *Freshwater Ecology* (343 pages, Longmans £3-50), brings up to date a standard, "Latin names only," technical work on the habitats and physical and chemical problems in the distribution of water-life, from microscopic *algae* to chiefly insects and a few fishes. Deputy Director of the Freshwater Biological Association at Lake Windermere, the author covers the inter-relationships of the communities of animal life with many examples from the Lake District, though the book is illustrated only by graphs and tables. There is no reference to the influence of aquatic birds, such as mergansers on fish, duck distributing *Daphnia*, or kingfishers, dippers, etc., to water-voles and otters, or their links with fish-parasites.

Guppy-breeders will know Ardey's discovery in North America the other year that if a single gravid female guppy is placed in one tank, and 50 male, female and juvenile guppies in another tank, they each eventually contain 3 males and six females after 6 weeks. This is their biological ratio after reproduction, and the limit to their cannibalism. Whatever acclimatisation is practised with the common guppy *reticulata*, its fatal temperature limit remains 33°C, whereas carp can be acclimatised to a temperature range, and young rainbow trout even from cold water to warm as well as *vice versa*. Guppies grow fastest at 23-25°C.

Goldfish can acclimatise up to a lethal temperature of 40°C and as low as 5°C, by not swimming about. At 20 degrees, yellow perch consume more oxygen than carp but less than American brook or speckled trout, which take over twice as much. Length of day influences the common stickleback's migrating into freshwater to breed, just as it influences the spring song and migration of birds.

These are some of the modern approaches to ecology which interest the fish-keeper. As the author produced this edition while at Idaho University, he includes several North American examples.

Does the thin black zigzag, or a black line, down the back of the young slow-worm and some mature females mimic the characteristics zigzag warning pattern down the back of the venomous adder—a case of Batesian mimicry where a harmless creature follows the warning pattern of a dangerous species, to escape its enemies? This is the theory of a Reading University zoologist. The pattern isn't found on the male slow-worm, and as slow-worms give birth to young at the same time as adders (both much later than the common lizard) it is considered that the pattern protects both from predators like buzzards or hedgehogs. An alternative would be for better camouflage among dead bracken.

Are there any adders in Radnor or South Lincolnshire? It is claimed that, like the Channel Islands and the Outer Hebrides, they have slow-worms but not adders.

Many people who collect aquatic plants for garden pools or fish-tanks must often find them occupied by *larvae* of various moths and other insects. It is rather a long job waiting for them to hatch out to identify them. Apart from the China marks in water-lily leaves, few seem to be familiarly known. It may therefore be a helpful guide if I mentioned some of these with their water-plant hosts, for it is a laborious job searching through the lists of plants given under each species in the tomes on our British lepidoptera which run to over 2,000 species.

In spring, for example, the caterpillar of the small gold moth, *Lampronia calthella*, feeds on marsh-

marigold, from which it takes its scientific name. Then, occasionally, a scarce little leaf-beetle *Chrysomela hannoveriana* is in its flowers. In May and June caterpillars of the crescent moth are found low down the stems of yellow flag iris, while stems and roots of butterbur feed the localised butterbur-moth, in Lancashire for instance. Rushes feed caterpillars of several small moths like *Bactra lanceolata*, and *B. furfurana*, *Glyphipteryx thrasonella*, while *Coleophora caespitiella* is in a leaf-case, and its relative *C. glaucicolella* is in a leaf-case chiefly of the glaucous sedge. Water-plantain is food for the moth *Phalonia alismana*, hence its name, while reed-mace reeds and bur-reed are riddled with the *larvae* of 6 or 7 wainscot moths. The first gives its name to *Nonagria typhae* the "bulrush moth" which pupates in its stems. The brown China mark moth *Nymphula* (—*Hydrocampa*) *nymphaeata* is found occasionally in bur-reed, but more often its aquatic larva feeds on broadleaved pondweed, *Potamogeton natans*, reddish pondweed and water-fennel, *P. pectonatus*. It is not confined to the *Potamogeton* pondweeds, as used to be assumed, and may be found on water forget-me-not, white water-lily, frogbit, water whorl grass (*Catabrosa*) and water-plantain. Bur-reed stems and water-lilies leaves are also bored by *larvae* of the beautiful china mark *stagnata* (it turns leaves black), duckweed by the small China mark *lemnata*, while the related and curious "false caddis" moth, *Acentropus niveus*, feeds on amphibious water-pepper (*Polygonum amphibium*), frogbit, hornwort and Potamogetons. The bur-reed wainscot takes its name *Nonagria sparganii* from its food-plant. The reed-wainscot *N. cannae*, burrows in stems of reed mace and iris in June and July, and *N. geminipuncta* great reed (*Phragmites*).

In stems of clubrush will be found the moth *Aristotelia lucidella* while the *larvae* of tiny *Elachista* moths mine the leaves of cotton-grass, along with Haworth's minor *Celaena haworthii* in May and June. The former also mine sedge leaves, as well as various grasses. Several caterpillars feed on mosses, chiefly the little *Bryotropha* moths, like *domestica*, *umbrosella*, *affinis*, *umdella*, *senectdella*, *politella* and *terrella*, as well as dull-coloured *Scoparia angusta*, in its silken galleries. Larvae of the tiny moth *Micropteryx calthella* feed in the feather mosses (*Hypnum*).

The brown-veined wainscot moth, *Nanagria dissoluta* feeds in reed-mace on Formby-Ainsdale dunes and its greyer variety *arundineta* in Cambridge fens. The fen-wainscot moth *Arenostola phragmitidis* feeds in *Phragmites* reeds from Holker Moss and Silverdale in north Morecambe Bay to Formby, as well as the Fens. Do not confuse this with Fenn's wainscot whose caterpillars feed in reed-mace in Norfolk's Barton, etc. Broads in August, the only other haunt outside England being in Belgium. Other wainscots like the *Rhizadra* and *Calamia* genera feed in the stalks and roots of reeds till July.

Sedges form the food of the now localised large heath butterfly in haunts from Shropshire's Whixall Moss to Wales' Tregaron Bog. Fragrant bog-myrtle is the food of the rosy marsh moth, rediscovered in north and west Wales in recent years at places like Dolgellau, Arthog Bog, etc. Both these moths have suffered from drainage. Sallow-moths and kittens make the waterside sallow bushes an attraction, the former dropping from the silky buds and catkins taken into a warm room for spring decoration, the adult moths being abundant in August. Many aquatic insects hide among water-plants without feeding on them, and the watercress-beds of the River Colne, outside London, were a great bug-hunting ground.

VIEWPOINT *continued from page 44*

which were immediately apparent were that a system of moving the females into any traps before the birth, and out again afterwards, would be most inconvenient and also hardly fair to the fishes themselves, and would probably impair the birth processes anyway. Secondly, any food not taken at the surface or while sinking would almost immediately disappear through the grilled base of the traps to remain uneaten with consequent pollution. The traps available commercially are far too small for serious consideration, it being obvious that the fishes must be affected by confinement in such small spaces, and the inherent shallow water levels resulting. Some large traps were therefore constructed using the Hyware "Standard" plastic tank with the bottom cut out, and a perspex grill substituted. In the course of making the grills it was necessary to cement the various pieces of perspex together and Tensol No. 6 was used for this, with no subsequent toxic effects. The resulting traps are approximately 14 in. × 9 in. at the top and the flange provided allows them to be suspended inside one end of a 36 in. × 12 in. tank from strips of glass laid across the width. The water level inside can be kept at any depth up to about 6 in. from the base of the trap by simply adding or removing water from the larger tank. The system is at present being used with platies, and each trap will comfortably hold two females and one male permanently. The adoption of this system has, of course, made a change in the diet of the fishes essential for the reasons just mentioned, and they are now fed only floating foods such as freeze dried *tubifex* or flake, and some whiteworm via a feeder. The whole thing seems to be working quite well, although the fishes were very nervous for about the first week in the traps. The use of the large tank as a holding container allows the fry to spend their first few weeks in the same water without being moved, another point which seems beneficial.

Tilapia ruetti

by Richard A. Dunleavy

AT THE TIME of writing I am unaware of the origin of this species, as I can find no mention of it in any of my books, but I would imagine it comes from some of the African lakes (maybe some readers will know?) I purchased my six *T. ruetti* some three months ago at my local dealers, and was told that this was the first time they had been seen in Scotland (?)

At the time I thought them rather drab looking, but decided to buy some as they were a new cichlid to me, and I am rather a fanatic about cichlids, I placed them in a three foot tank in my fish house along with a breeders team of *Cichlasoma salvinni*, where they soon settled in and began feeding right away.

When purchased they were about two inches long, and as I write this five are three inches long and one two-and-a-half inches, the smaller one being the only female. I suspect that this is the full size of this species, but then again time may prove me wrong. The colours are not brilliant but they are attractive, with a basic body colour which is a rather brassy yellow with rows of blue dots on the sides, and a rather large green spot on the gill-covers, the dorsal fin is edged with a light blue line and shows the typical *tilapia* spot three-quarters of the way along.

Male and female are almost identical in colour, the male having a red border to his tail fin and almost black ventral fins. The caudal fin of the male has a pattern of blue spots while the female lacks this pattern.

At breeding time the female turns sooty black, while the male colours intensify. My breeding pair first spawned in the original tank in which they had been placed along with the aforementioned fish. Having bred a number of Cichlid species, I started my usual feeding regime of lots of chopped up garden worms, with a once weekly partial water change which I had found ideal for bringing my Cichlids into breeding condition. One week later I noticed that my female had turned a sooty black and, accompanied by an intensely coloured male, was defending a corner of the tank from the other ten inmates. (I should state here that the tank measured 36 in. × 15 in. × 12 in.).

The water temperature was 26°C, with a pH of 6:8. The tank was planted with four large Indian fern, with some smaller Indian fern floating on top (another reason for recommending these fish is that they make no attempt to either eat or destroy plants) and to complete the furnishing, a number of rocks and pieces of slate as spawning sites. Needless to say, the pair ignored these sites and proceeded to spawn on the glass in the corner of the tank, right behind the frame; both parents took turns in guarding the eggs, but the female would turn nasty now and again and drive the male away. The following day the eggs had vanished, and the pair were back to their normal colour. The next day I put a partition in the tank and gave the pair half the tank to themselves; ten days later they spawned again in exactly the same place, and again the eggs vanished. This happened on four occasions and I decided that if given the chance I would hatch the next spawning artificially.

To do this I had to get the pair to spawn on some object which was easily removed from the tank, and to this end I planted bunches of *Elodea densa* in the four corners of the tank to prevent them being used as spawning sites (I hoped) and added a flower pot with the base upwards and a large "V" shaped notch in the side. I carried on with the feeding of earth worms and siphoned off one third of the water, replacing it with water straight from the tap, and, on the 16th January the pair obligingly spawned on the base of the flower pot. I removed the flower pot with the eggs, and using water from the breeding tank I set up a twelve inch tank into which I placed the eggs. I then added five drops of Methylene blue and an air stone, which was placed just in front of the eggs to help prevent any suspended matter from settling on them.

Two days later, on the 18th January, about one-third of the eggs had hatched and the rest had fungused. By the 21st they were free-swimming and feeding on *infusoria* which had been added to the tank the day before. The fry, approximately sixty, are now three weeks old and one cm. long and growing rapidly.

As I finish this article I have an even larger spawning from the same pair of *T. ruetti*, this time on the inside of the flower pot, and it looks like there is going to be a 100 per cent hatching.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A.

Photographs by the Author

LAST MONTH'S FEATURE contained letters from some of the oldest readers who have written to me. The first of this month's letters comes from the youngest reader who has written to me so far. He's 8 years old David Payne, of 85 New Eaton Road, Stapleford, Nottingham NG9 7EL, and he wrote his own letter. David said: "I bought some goldfish recently and I would like to breed them. Could you tell me how to sex them? If you don't want to put this in the magazine could you send me an information sheet, or something, about goldfish?" (Unfortunately I'm not an expert on coldwater fishes, David, so I have forwarded your letter to Mr. Arthur Boarder who is the expert in this field. If you can persuade your parents to buy you a book on the subject, I suggest that you obtain a copy of *Coldwater Fishkeeping*, by Mr. Boarder. It costs £1·00, including postage and packing, from *The Aquarist and Pondkeeper*, and should provide the answers to most of the questions you might want to ask. Incidentally, while on the subject of books, I recently got a copy of *A Guide to Freshwater Aquarium Fishes*, written by our tropical expert Mr. Jack Hems together with his colleague Mr. George F. Hervey. The book is published by The Hamlyn Group, at £2·75, and is one of the most delightful books about tropical fishes and plants that has come my way for a very long time. The book is beautifully produced, contains a wealth of accurate information for both beginner and advanced aquarist, is written in good English, and is illustrated with some excellent drawings and black and white and coloured photographs. The format and presentation match the high quality of the contents).

Mr. P. Wilson's address is 228 St. Cyprian's Court, Holdbrook North, Waltham Cross, Herts. He writes: "I have found that the 'New Glory/Wair' pump is without doubt the quietest I have seen or heard. The only problem with these pumps is the changing of the rubber diaphragms. I tried to change them once and found it an impossible task. I ended up taking the whole thing back to the shop where I purchased it in order to have it repaired by the manufacturer. The shop let me borrow another pump (same model) and after one week I returned to the shop and I was told to keep the pump I had borrowed. For well over a year this pump has been working non-stop with no signs of wear at all. Also, it has at times powered up to four U/G filters at the same time. I have tried introducing several types of plants into my tanks but only one has survived—a rather stringy Anacharis. Perhaps you could advise. The only tablet food that I have given my fish is Tetramin, and although the fish will eat them I get the impression that they do so 'under protest'; they will immediately leave the dissolving tablet for some Phillips flaked food, which they seem to eat with relish. I have never tried plant fertilizers in my tanks; in fact I have never seen or heard of any in my local shops. Would it be possible to use a fertilizer while using U/G filters? In answer to your last question, I found that before I started keeping my own fishes a visit to the dentist or mental hospital for treatment was a nerve-wrecking experience, only relieved by watching the tanks of fishes in the waiting rooms. However, since starting to keep my own fishes I have suffered two nervous breakdowns (not through fishkeeping) coupled with severe depressions, and I have tried to get out of them by looking at the fishes—but to no avail. So it seems to me that to non-fishkeepers they most certainly do have therapeutic value if only because the person is seeing something new and unusual which stimulates an interest." (There could be many reasons for poor plant growth in your tanks, Mr. Wilson. Without seeing them it is difficult to give advice. However, you could well try using a fertilizer made for use in aquaria. Zoomedica Frickhinger's 'Dynoplant' is a good one, as are those manufactured by Miracle, and Tetramin. Follow carefully the instructions supplied with each product. You could also try increasing the intensity of light over your tanks and try cutting down on the number of hours for which your U/G filters operate; try leaving the filters off when the lights are on. Check that the water in your tanks is neither too acidic not too alkaline).

My thanks to Mr. R. C. Mills, of 70 Lee Road, Perivale, Middlesex UB6 7DB, for sending me the most recent edition of the Bulletin of the Federation of British Aquatic Societies. The Bulletin, which is edited by Mr. Mills, contains a wide variety of interesting items—from poetry and book reviews to

details of how to build a power filter for approximately £4·55; and plenty of news about the F.B.A.S. (Perhaps Mr. Mills would care to send me some details about the classification of show judges: how they are selected and how they gain promotion. It's a subject about which I know little or nothing).

My reference to Thomas Hardy's mention of a marine aquarium in his novel *A Pair of Blue Eyes*, published in 1873, brought some interesting information from Mr. D. Franklin, of 152 Drake Avenue, Dines Green, Worcester WR2 5RR. Mr. Franklin writes: "I have a book called *The Fresh and Salt Water Aquarium*, by the Rev. J. G. Wood, M.A., published in the latter half of the last century. The book is not dated but there is a reference to the Education Act of 1873. It cost one shilling when published, and I bought it last year from a charity shop for 5p. It contains a few quotable quotes: "The history of aquaria is quite recent but in the few years of its existence . . . (it had) . . . its origin, its rise, its decadence and its renovation. Some years ago, a complete aquarium mania ran through the country. Everyone must needs have an aquarium, either of sea or fresh water, the former being preferred . . . *aquarium* is a simple and easy word, and entirely superseded *aqua-vivarium*, just as in a later year the word *telegram* superseded *telegrapheme*! The fashionable lady had mangificent plate-glass aquaria in her drawing-room, and the schoolboy managed to keep an aquarium of lesser pretensions in his study. The odd corners of newspapers were filled with notes on aquaria, and a multitude of shops were opened for the simple purpose of supplying aquaria and their contents. The feeling, however, was like a hothouse plant, very luxuriant under artificial conditions, but failing when deprived of external assistance.

" 'Perhaps the beautiful plate-glass aquarium fell to pieces, discharged several gallons of sea-water over the fashionable carpet, and covered the fashionable furniture with sea-anemonies, crabs, prawns . . . or some of the inmates died, and the owner was too careless to remove them. Consequently . . . in a few days they avenged themselves for the neglect by rendering the water so fetid that no one with ordinary sensibility could remain in the room. So, in due course, nine out of every ten aquaria were abandoned; many of the shops were given up, because there was no longer any custom; and to all appearance the aquarium fever had run its course, never again to appear, like hundreds of similar epidemics. Those who treated the aquarium as a toy soon became tired of it, and cast it away accordingly, but those who saw its real capability became more enamoured of it daily. Now, therefore, the number of aquaria is not nearly so great as was the case some years ago, but those that are in active existence are properly tended, and the teachings carefully learned.' The author goes on to despise people who have very deep, narrow tanks with a need for 'ingenious pumps . . . by means of which streams of air were forced through the water. Some people employed syringes, filled with water, and squirted the water into the tank with such force as to carry a quantity of air . . . others were content with taking up some of the water and letting it fall back with a splash, so as to produce the same result. It will now be seen that an aquarium . . . ought to be as wide as possible, so as to present a large superficies of water to the air.' The Rev. Wood continues in this vein, dealing mainly with

Neon Tetra

marine invertebrates, and produces a book containing many rules still followed by modern aquarists."

Mr. Franklin himself goes on to say that he has two 18 in. × 10 in. × 10 in. tanks and one 12 in. × 8 in. × 8 in. tank. He hopes to get two 36 in. tanks in the near future, and will then replace the 18 in. tanks with 24 in. tanks. Mr. Franklin continues: "I am suffering from a population explosion at the moment since my pair of *P. pulcher* produced about 70 offspring in two hatchings. Things are desperate! The first brood of 15 are of saleable size, but this will not help much. I'm waiting for the council to instal another power-point. In the future I intend to concentrate on cichlids as they seem real 'personality' fishes. The pulchers are the only fish I have attempted to breed, but they were 'dead easy.' They just required a well planted tank, some coal rock-work, a small flowerpot on its side and another tank in which to deposit the male if the female attacks him when the eggs hatch. Hell hath no fury like a mother pulcher!" (I have left the Rev. Wood's English and spelling as it was printed in his book. No doubt the reverend gentleman would be amazed to see just how popular his hobby is today—particularly the tropical side. With the miners' strike over now the hobby should continue to flourish.)

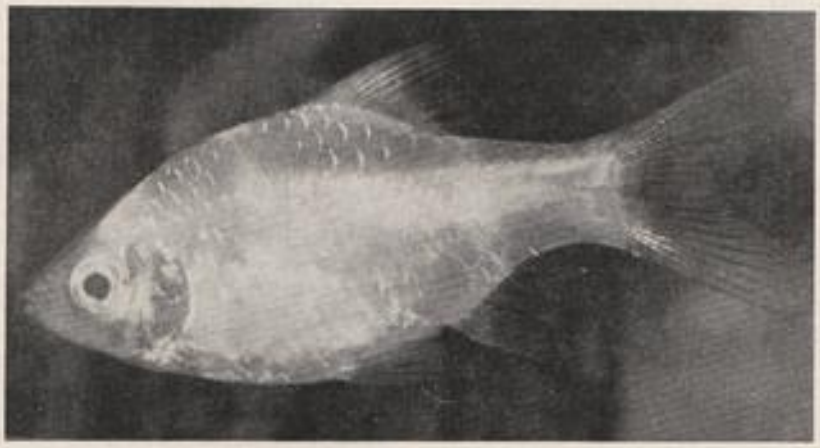
My latter comments bring me to a rather sad story from one of our lady readers, Mrs. R. Halsey, of "Oakmoor," Station Road, Elsenham, Nr. Bishop's Stortford, Herts. She writes: "I have been keeping tropical fishes for a while, but a few weeks ago we had an electricity cut which, because of the miners' go slow, was not restored until two days had passed. Therefore I lost all my beautiful fishes with the exception of a few guppies. Does anyone know how I could have kept four large and nine small tanks warm for two days? Also, has anyone any spare fishes to sell to help me stock up my tanks again after my great loss? Would it not be a good idea to have a pen-friend section so that one could write to other aquarists and thus gain a lot of hints as well as some good friends?" (My sympathy goes out to Mrs. Halsey as it must be very disheartening to lose virtually one's whole collection of fishes. Perhaps some readers in her area, with spare fishes, would consider *giving* her a present of a few? I was lucky in that there were no power cuts in the area in which I live.)

The next letter reached me from Germany—from Mr. D. Bashford, The Meterological Office, R.A.F. Gütersloh, Germany, BFPO 47. Mr. Bashford writes: "Without a doubt the quietest pumps I've come across are the Wisa series. As a relative newcomer to fishkeeping—2 years—I have tried several of the smaller vibrators and found the wife complained of the noise. My Wisa 120 supplies the filters for four tanks with enough air left over for a couple of small tanks occasionally brought into use for quarantine purposes. Another point about the Wisa series—they don't seem to 'creep' when on a flat surface. Tablet foods that sink are used in my tanks as a change from several brands of flake foods used in rotation. The dozen *Corydoras* in one tank sit rather positively on top of the tablets until they've been all eaten. The dwarf gouramies I've had seemed to spawn at the drop of a hat. Conditions were fairly neutral water in a large, community tank with an outside filter. Fertilizer tablets placed under plants in a newish tank seem to keep the plants going until the tank matures. I have found that the Germans are very enthusiastic aquarists: all the local pet shops are very helpful and put up with my

Zebra Fish

questions in fractured German. They have even *given* me odd fish and samples of food."

Mr. S. Wolstenholme lives at 185 Smithy Bridge Road, Littleborough, Lancs. He has something to say about recent comments in this feature concerning calcium carbonate (limestone, shells, etc.) in aquaria. He writes: "The general opinion seems to be that plants grow better in soft water and calcium carbonate is most undesirable in the aquarium. I have many tanks which show that this is untrue to a large extent. I keep 18 tanks entirely devoted to Malawi and Tanganyika cichlids and I use calcium carbonate to obtain the required hardness. The exact hardness is unknown as I do not measure it. I measure the conductance instead and it measures the total mineral content; but I can say from my experiences in the past that it is over 30 DH. The following plants grow better now than they did when the tanks were set up for soft water fishes: *Vallisneria*, various types of sword plants, *Aponogeton crispus*, *Cryptocoryne wendtii*, *Riccia* and Java moss." Mr. Wolstenholme continues: "The Eheim 386, although expensive, seems to be the best small to medium sized filter on the market, with the Diatom a close second. The Diatom only gives its 150 g.p.h. output for a short time after the powder has been replaced, even when filtering 'clean' tanks. The Eheim maintains a high output for many hours, even on a 'filthy' tank. The end product of both is a spotlessly clean tank, but no doubt the Diatom has removed even the finest particles as the manufacturers claim. There is no visible difference. Combined heater/thermostat units are easy to fit and easy to hide; also, in my opinion, they last longer than separate units. I have found that the Hykro power filter gives an output of 30 g.p.h. when operated by a good air pump. This must make it the best low priced outside filter. Cichlid eggs hatch very well in a solution of methylene blue and tap water of the same temperature as the tank water. The solution should be so strong that you cannot see the eggs at a depth of 6 in. Assuming that the eggs are fertile a 100 per cent hatch should be obtained. The problem is to get the fry into a tank full of food without killing the fry or the food. The methylene blue has to go first as I think the best way is to siphon most of it out and then siphon some tank water in slowly. Use an air line, with a fine air stone, as the siphon tube. Repeat this until the water is clear and then tip the fry into the tank. No methylene blue gets into the tank and the fry don't suffer a rapid water change. At this stage I do not use any fry food; I just allow them to pick around a suitable tank for about a week. By suitable I mean well used and slightly dirty, but which has been without fish for about two weeks. I then feed the fry on micro worms and brine shrimps until they can take other foods. The only fish I now keep which require this treatment are *C. festivum*.



Albino Tiger Barb

"I have found 'living rock' to be very interesting and good value for money. It keeps coming up with new bits of life for months on end but it always seems to die off after about 6 months, leaving few if any living creatures behind. I believe a good aquarist should always have his fish in breeding condition—except just after they have bred—and should thus not require any special (conditioning) food. It is easier said than done! P.S.—An exchange group is available to anyone breeding or trying to breed east African cichlids, and persons

breeding Malawi or Tanganyika cichlids are welcome to participate. Many species are available. There is no charge other than postage. I can supply details." (Mr. Wolstenholme has made some interesting points in his letter; however, I would point out that I do not necessarily agree with the views expressed by contributors to this feature.)

No. 35 Manor Drive, Hilton in Cleveland, Yarm, Yorkshire, TS15 9LE, is the address that heads the letter from Mr. F. Ayres. He writes: "I have only once tried tablet foods, actually freeze-dried brine shrimp tablets. According to the label on the container the tablets should have stuck to the aquarium glass for the fish to pick at. Mine would not stick at any price! Alternatively, the tablets should be floated on the surface. At least half of mine promptly sank. Not even my larger fish, including angels and pearl gouramies, showed any interest in the pellets until they broke up. Consequently I no longer use them. My tropical tank measures 48 in. × 18 in. × 18 in. and I have a screen of *Aponogeton undulatus* along the back. At this depth, and planted in 3 in. of gravel, I find it grows extremely well. My attempts to grow it in a 24 in. × 12 in. × 12 in. tank, with the same depth of gravel, were very disappointing; so I think water depth is important. I have also found that it grows better in strong light than poor light and does not do well in water with a pH value of greater than 6·7. In my outside pool I grow *Aponogeton distachyus*—water hawthorn—and find it so prolific that I cannot completely eradicate it. It even grows as a floating plant if I let it. Regarding breeding egg-layers, my main interest is in Nishiki-Koi and veiltail orandas. My tropical tank is a community tank kept mainly for ornament. I have not tried to spawn any of the egg-layers but my angelfish have spawned frequently. In the outside pool common goldfish are almost impossible to stop spawning. I was once confined to bed for some weeks through illness and for some time was too ill to read or talk much, but well enough to be bored by doing nothing. During this time I gained great comfort from watching my 24 in. × 12 in. community tank which I had in my bedroom and which kept me sufficiently occupied mentally to prevent boredom. I feel certain that this assisted my recovery. You may also be interested to know that I was obliged to remove a large community tank from my office because it distracted my clients so much during meetings. Finally . . . your column . . . reflects the fact that our hobby is, unlike so many today, a number of ordinary people interested in one activity, rather than a professionally organised activity with ordinary people being allowed to participate."

I was pleased to receive a copy of the *Cichlid Clarion*, the official journal of the British Cichlid Association. This little publication contains information which would be of interest to cichlid fanciers. It was sent to me by Mr. T. Acott, of 18 Rosary Close, Hounslow West, Middlesex TW3 4NJ. Mr. Acott is the General Secretary of the B.C.A. For those interested in joining, the Membership Secretary is Mr. P. Berry, of 131 Sherbrook Road, Daybrook, Notts. In a letter accompanying the journal sent to me, Mr. Acott writes: "In the March *Aquarist* you aksed for experiences with *Corydoras aeneus*. I have three in my Rift Valley community tank, where the pH is 8·4; they have also been kept in water with pH 8·4—8·6, containing large amounts of salt for over six months and they showed no ill effects at all. Would anyone with a *Haplochomis nigricans*, from Lake Victoria, please contact me. The fish has a midnight blue body with red trimming to the dorsal, and a red tail similar to the red tailed black shark. . . . "

I received a very entertaining little poem, in the style of Rabbie Burns, from Mr. J. Shortt, who lives at 107 Oakley Road, Corby, Northants. It was about one of Mr. Shortt's hatchet fish. I have passed the poem on to our Editor for his consideration.

Mr. V. Knight's address is 8 Unwin Street, Bradeley, Stoke-on-Trent ST6 7NH, and his letter stretched to fourteen pages! I'm sure he won't mind if I only use part of it on this occasion. Mr. Knight writes: " . . . I don't have to tell you that breeding the neon tetra isn't easy—until you know how; and when anyone spends some years before finding the answer are you surprised if they keep quiet about it?" (I'm not surprised; but if everyone who bred a fish for the first time had kept quiet about how it was done there would be a very limited number of fishes on the market—and even fewer books and magazines available for ordinary aquarists. Does not half the pleasure to be obtained from being amongst the first to breed a particular species of fish, or manage to successfully cultivate a particular species of plant, come from telling other people how to do so for themselves? Admittedly there are some such people who must earn quite a bit of money from writing and selling books which pass their former secret methods on to those who buy the books; but there are many others who publish their findings in magazines and journals and receive very little or no money for doing so. No doubt there is a small number of people who breed fishes only to enable them to win prizes and praise at shows; no doubt the members of this minority group keep their breeding and rearing secrets to themselves. They have a right to do so—but I don't envy them. Perhaps that's because I earn my living by trying to pass on information and skills by teaching and writing; but perhaps I'm biased. What are readers' opinions?) As this is not a personal attack on Mr. Knight, I shall return to his letter. He continues: "I only know of one

or possibly two people whom I would believe have spawned the neon around this area—and I mean spawned and hatched the neon. I used to think they were very special people; however, I have now joined the select few! I have been devoting endless hours for about four years—with a short break between—trying to find the answer to this elusive fish. I tried all the various things I read by all the people who had 'done it'; also variations of these suggestions; and to put it politely some of these people would have been more helpful if they had not made their stupid suggestions as to how it should be done. Getting the neon to spawn is no problem: lots of people have seen this in their community tanks. I didn't even know what to look for—that is, short dashes at each other; I thought the fish were just sparring a little violently.

"My first success was very recent although I had had plenty of eggs that did not hatch. On 6th January, 1974 I put my fish in a prepared 18 in. × 10 in. × 10 in. tank. After a very short time I thought I could see a few eggs. That was enough for me. I took out some of the water and put this into a small plastic tank, and netted the fish into this. Nothing became of the eggs in the 18 in. tank, but the fish carried on spawning as if nothing had happened. It was difficult to see through the old plastic and I could not see any eggs. I got a bit of nylon and sucked out round the bottom of the tank. The nylon was full of eggs. Out came the poor fish again; the tank was blacked out with paper. This spawning had been on the 7th January; on the 8th I thought I could see fry flitting up and down on the base. I re-covered the tank and on the 9th saw nothing. On the 10th I saw one fry swimming. On the 11th I could see nothing, lost patience and put in a pair of cherry barbs. That was probably my first success, though I didn't realise how difficult the fry are to see. I made all my observations with a magnifying glass. My next attempt was a bit more methodical, more successful and more tantalising. On 20th January I set up an all glass, silicone sealed 18 in. × 10 in. × 10 in. tank; on 21st the fish spawned. I thought it was a bad sign as I could see the eggs easily. However, I took out the fish and returned them to the stock tank where they started to spawn like mad. I quickly inserted a separator and parted them. I wanted the eggs for future trials. My notes read: 22nd January—no mistake this time; several minute fry lying on base; some eggs with eyes visible not hatched (followed by water chemistry, etc.); 23rd January, 5.00 p.m., several fry still on base; 10 p.m., not a sign of anything; never mind, hope they are there. 24th January—amazed and delighted, tapped under tank, quite a few fry rose and dropped back; now only a single layer of paper on tank. 25th January—saw two swimming along bottom; one swam about 6 in.; later saw two hanging at back and one bobbing up and down in corner. 26th January—same. 27th January—fourteen counted on back glass, a couple swimming, also several possibles in corners; later, at 10.30 p.m., quite a few swimming; front glass almost uncovered now; some came to front for the first time. Still can't believe I've found the secret. 28th January—only two, swimming, plenty back on glass, end of story up to date.

"I do wish they would liven up a bit! Still, it's progress. You will notice I haven't given many pieces of useful information, but at least I haven't given any misleading ideas such as those that held me back for quite a time. Perhaps someone still struggling may glean another piece to add to the puzzle. I am taking it for granted that I have found the answer, however I set up another tank on the 25th January to see if it was just luck this time. I may have to go back a few squares yet! I would like to reply to Mrs. Houps' query on frequency of spawning. The experts in the books usually state 'every ten to twelve days.' Based on my own experiences only I would put it nearer to five days—or even less! Of course, the spawnings wouldn't be as big, but plenty big enough to see if conditions were correct. I don't want to dampen Mrs. Houps' enthusiasm, but I would be surprised if, on the information she gave, she got the eggs to hatch; but at least she has got many, many months' start on my first, stupid attempts. One tip I will give, and it can save many hours of wasted effort; the tanks don't need to be as chemically sterilized as some 'helpers' advise. I merely wiped out my tanks with newspaper. So what it all adds up to is this: Take heart if you want to breed neons. It isn't impossible. I'm no expert aquarist and I've managed it! One more point before you relax after my long letter: I wasn't psychologically disturbed before keeping fish, but my wife thinks I'm a real nut now when I come home and say, 'I must see if the neon fry are still there before I have my tea.' P.S.—29th January—neons still surviving!" (I found Mr. Knight's comments about breeding neons very interesting—even if he didn't actually tell us very much about the process. Do any others have successful experiences to recount? If so I would be pleased to receive them. I may be able to fit the other half of Mr. Knight's letter into a future feature; but perhaps Mr. Knight will yet tell us how to successfully breed neons when he has completed and confirmed his findings and experiments. If he were to write a full length article on the subject, I'm sure our Editor would be pleased to consider it for publication as a separate article. Photograph 1 shows a neon tetra.)

No. 12 Somerset Road, Tunbridge Wells, Kent, is

the home address of Mr. V. Bethell. In part of his letter he writes: "... The easiest fish to breed must, without doubt, be the zebra danio which, providing the famale is in good condition, will breed in any water at a temperature of 75-80°F. I have found it to be a hardy fish and the fry are very easy to rear. I started breeding tropical fishes just about a year ago purely by accident. My bogey fish is the dwarf gourami. I have had three complete broods die on me for no apparent reason and for some reason the male fish no longer seems to be interested in mating although he will tear up my plants and build a nest from time to time. Incidentally, I can't recall seeing mention of the upside down catfish—*Synodontis nigreventis*. Surely this graceful and good tempered fish is worthy of some form of recognition?" (If I recall correctly, one of our leading experts once told me that adult dwarf gouramies frequently carry *Oodinium* parasites on their bodies without being affected by them. However, these parasites could easily wipe out a brood of fry. A suggestion which you might care to try would be to treat the adult fishes with acriflavine, or with an appropriate commercial preparation, before attempting to spawn them; or an appropriate preparation, suitably diluted, might be tried after the fry have just hatched. Would any readers care to comment?)

Mr. P. Turner resides at 20 Kent Road, R.A.F. Binbrook, Lincoln, LN3 6ET, and his subject is the zebra fish—*Brachydanio rerio*. He writes: "I was stationed in Cyprus when I bred my first egg-layer—the zebra fish. . . . The tank used was 18 in. × 12 in. × 12 in. and when it was cleaned out the bottom was completely covered with marbles. The tank was half-filled with tap water that had stood for a week in a plastic dustbin. Neither pump nor filter was used, and I did not use a heater or thermostat either because the weather was so hot and the water temperature was 78-80°F. The pair of fish was put in the tank about two hours before dusk and left alone. The following morning I noticed a few white specs on the marbles; so the two fish were taken out and replaced in the community tank. I waited a few days but nothing appeared to be happening to the white specks. A friend was consulted and he told me that the white specks were infertile eggs and that the only fertile eggs are those which are clear specks about the size of a pin head. Upon closer examination of the tank I discovered quite a few fertile eggs. It was not until five days later that the fry started to swim about the tank. Since then I have bred zebras quite often with a fairly good success rate."

Photograph 2 shows the zebra fish.

Mr. M. Gill writes to us from 4 Fitzgilbert Road, Colchester, Essex, about breeding the "zebra danio." Mr. Gill placed two pairs of fish in an 18 in. tank with coconut fibres on the base. Next morning the females were much thinner and he removed the adults. Despite having washed the coconut fibres well they were very messy in the morning; Mr. Gill tried to dislodge the eggs and then removed the fibres. As no fry were ever found he assumed that the eggs were removed with the fibres. For his next attempt he covered the base of the tank with small pebbles and marbles to protect the eggs; he also lowered the water level to 2-3 in.—as opposed to the 6-8 in. used on the previous occasion. Mr. Gill writes: "It was at this time that I was given a tip by another aquarist on how to breed fish such as zebra danios. It was to sprinkle water of a slightly lower temperature, over the surface of the tank water as this would induce the fish to spawn because to them it would appear to be rain. I used this tip and found it most effective, resulting in a large number of fry which I brought up to nearly adult size before selling."

Photograph 3 shows an albino tiger barb. I would be pleased to hear of your experiences with this attractive fish.

For a future edition please send me your opinions on the following: (a) What have been your experiences with the cultivation of red *Cabomba*? (b) Mr. B. Simmons, of 15 Inhurst Way, Tadley, Nr. Basingstoke, Hampshire, has recently noticed an increasing number of advertisements for vitamin preparations for fishes. On a recent TV programme about people taking extra vitamins he learned that in some circumstances taking extra vitamins could be a dangerous practice and could cause illness or death. He asks: "How do we know if our fishes need extra vitamins and are we doing them any harm by giving them?" (c) I recently purchased two young fish which were sold to me as the "brass" tetra. The fish have an attractive, silvery body that reflects light as would brass; the caudal peduncle has a faint black spot; the anal fin has a white edge. What is the correct name for the "brass" tetra and have you kept or bred it? (d) I recently purchased a fairly expensive outside filter (foreign) and had to modify it using a hacksaw and adhesive, and replace its faulty air stone with a British made one, before I could get it to operate properly. Have any other readers had similar experiences, or have you been able to modify any brand of outside filter to improve its performance? (e) What is your opinion on the "balanced aquarium" controversy? Please PRINT your name and address carefully and enclose a s.a.e. if you require a reply. (Specific queries about coldwater or tropical fishes should be directed to Mr. Boarder or Mr. Hems, respectively.) I look forward to receiving your letters.

FEEDING THE BIG FISH

by Gordon T. Horton

THOSE of us who are serious breeders of tropical fish know well the value, and indeed the necessity, of live foods for every stage of our fishes' lifespan.

While flaked, frozen and dried foods are fair substitutes they in no way compare with, for instance, a diet of *Daphnia*, *Tubifex* worms and Brine-shrimp. Tropical fish fed almost exclusively on live foods will achieve a greater size sooner, will be healthier, and much more important to the breeder, will prove to be more ready and prolific when put to spawn. It is not my intention here to disparage dried foods, good ones as their formulas show, are the best that can be achieved in that field and do offer that all important change of diet. However, they do not excite and nourish fish as does the introduction of live foods into our tanks.

In those exotic and far-off tropical rivers such as the Amazon, the Congo, the Nile and the Ganges the shoals of fishes are known to feed on the vast numbers of insects that fall, sometimes almost like rain, on to the broad water surfaces of these rivers. It is a well-known fact that insects are excellent food for fish. Many of us will remember those small cardboard drums of ants' 'eggs' we fed exclusively to our pet goldfish in the not too distant past.

While I do not advocate that we should search our gardens for ants' 'eggs', or frantically chase every fly that comes within striking distance, I do recommend the breeding of insects as a constant source of highly nutritional live food for our finned underwater stock.

There is nothing so prolific and easy to breed, that produces live food in all sizes throughout the whole year, as a culture of Desert Locusts.

This species, *Schistocerca gregaria*, is the notorious crop devastator insect of Africa and Asia Minor. It is so prolific that if only six generations were allowed to breed unchecked they would easily then cover the whole of the earth's land surface. However, nature in the form of predators, lack of food, disease, etc., takes its toll of the vast swarms of ground 'hoppers' and airborne swarms.

Anyone who keeps tropical fish can breed Locusts, in fact the requirements of both are very similar—heat, light and food. In keeping with its origin, swampland in Central West Africa, *Schistocerca g.* requires a fair amount of heat. Both breeding and rearing cages should average 80°F (28°C).

The Cage

This, ideally, should be 20 in. × 10 in. × 12 in., the bottom and back of wood or Formica, the two short sides and top of fine metal gauze. The front with the access door is of glass for easy observation of the insects. The necessary heat and light is provided by a 75 watt light bulb hanging down in the cage from a fitting cut in the centre of the metal gauze top, alternately, a batten lampholder can be fixed to the back of the cage.

I did say 'ideally' but we fish keepers are nothing if not good at adaptation. Alternatives to the above are disused leaky aquarium tanks, of which we all have a few and cages based on strong fine meshed netting, 1 in. × 1 in. softwood framework and strong cellophane. I have bred locusts in all of these types and even hatched them in sweet jars.

Feeding

The staple diet for this insect, which incidentally is of the order *Orthoptera*, embracing the Cockroaches, Mantis and Stick Insects, etc., is wheat bran with a handful of fresh grass every day. You can 'spoil' them, and perhaps get better breeding results, with the addition of lettuce, privet, sprouted wheat, Bemax, etc., all of which *Schistocerca g.* will consume avidly.

Breeding

The initial culture should be some 8 to 12 pairs of sexually mature adults. These will be seen to be mating

(Continued on page 73)

FAILSAFE HEAT & AIR UNIT FOR THE HOME AQUARIUM

by Colin Tunstall

PERHAPS one of the biggest headaches of the serious aquarist is the problem of power-cuts, whatever their cause.

My aquarium, 38in. × 12in. × 15in., is situated in the garage, the worst possible place for it to be in the event of a power failure; the temperature would drop very rapidly during the winter.

The problem facing the freshwater aquarist lies in getting heat to the aquarium, whilst for the marine aquarist it is getting both heat and air to the tank. The most logical first step to solving the first problem is to thermally insulate the aquarium.

I acquired several thick 'sheets' of expanded polystyrene which formed insulating packing on livestock carriage. I obtained these from a large aquarium stockist for nothing. Several sheets may be stuck together to insulate the long rear pane of glass. This must be done with the proper glue, and for additional strength a 6in. strip may be glued across both sheets. The polystyrene may be stuck to the glass with electrical insulating tape quite successfully, and removed when not required.

Aquarists may be interested to know that a range of 12 volt aquarium heaters are currently available, to special order only, from:

Mr. C. J. Skilton (Aquarist),
Great Gibcracks Chase,
Butts Green,
Sandon,
Chelmsford CM2 7TR,
Essex.

I am told that these heaters range from 10 Watts to 100 Watts, and a typical price for a 25 Watt heater is £1·50+V.A.T.

Now a word of advice; it may appear obvious to choose the heater nearest in power to the one already in your tank, and to simply control it with a normal external thermostat. This will NOT work, and to try it will ruin the thermostat, as it cannot cope with the large currents that flow when using low voltages.

I understand that there are heavy duty thermostats available for controlling these low voltage heaters, but they will not be cheap. To avoid using such a device, I would suggest the acquisition of a heater that is about half the power (or slightly over) of the mains-operated heater in the aquarium.

Unless one is using a generator during a power-cut, it would be very difficult to maintain the normal tank temperature for any length of time. The next best thing to do, however, is to control the level of temperature fall. After all, a lot of fish can survive astonishingly low temperatures, but not when the temperature falls rapidly. It is with that factor in mind that I write this article.

"Fine!" you might say, "Great to have a potential emergency heating system for the aquarium at week-ends, but what about during the day and at night when there's no one around to switch on when the mains goes off?"

Well, if you have a 12 volt car battery, a little ingenuity and a little over £5 to spend, the following automatic unit may be made. It will switch in automatically a 12 volt heater when the mains goes

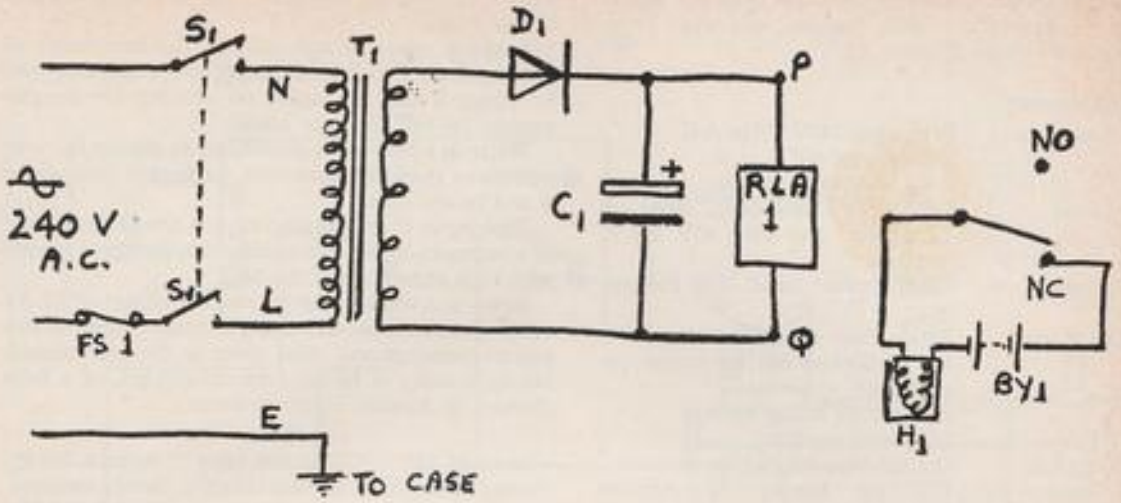

S1
T1
D1
N
P
NO
240 V
A.C.
S1
L
C1
RLA
1
NC
FS 1
Q
BY1
H1
E
TO CASE

FIG. 1.

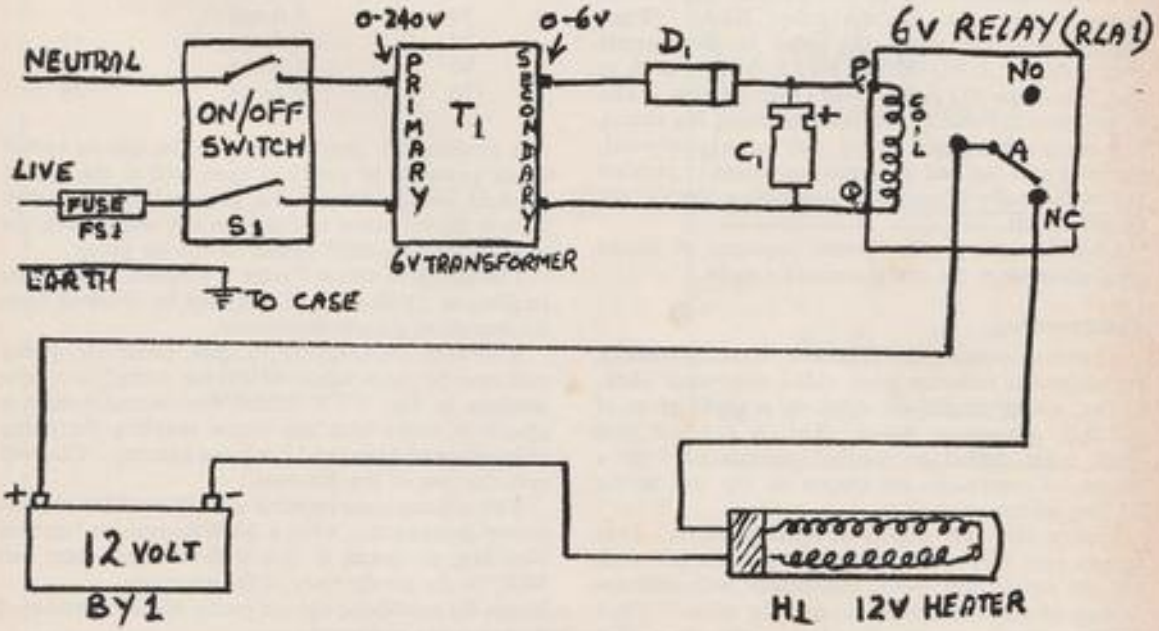

0-240V
0-6V
D1
6V RELAY (RLA1)
NEUTRAL
ON/OFF
SWITCH
PRIMARY
T1
SECONDARY
P
NO
LIVE
FUSE
FS1
S1
C1
COIL
A
NC
EARTH
TO CASE
6V TRANSFORMER
+
-
12 VOLT
BY1
H1 12V HEATER

FIG. 2.

off, and will cut out when the mains comes on again. Fig. 1 shows the circuit diagram, and Fig. 2 the equivalent wiring diagram.

Components

T_1 Transformer	Primary 0-240V 50Hz A.C. Secondary 0-6V R.M.S. rated at 100mA or over.
D_1 Diode	OA200 or equivalent, rated at 100mA or over with 40V P.I.V. or above.
C_1 Capacitor	120μF (micro farad) 25V Electrolytic.
RLA1 Relay	Single Pole changeover type. Min. 100ohm coil resistance (or above) 6V operation. For contact rating see text.
FS1 Fuse	For rating see text.
S_1 Switch	Double Pole Single Throw.
BY_1 Battery	12V car battery 30 Ampere hours.
H_1 Heater	12V 10 Watt to 100 Watt rating.

Case to house unit, S.R.B.P. circuit board (do not obtain a circuit board with copper strips underneath as shorts may result), wire, solder, etc.

Mode of Operation

The components T_1, D_1 and C_1 make up a small power supply unit for the relay, RLA1. When plugged into the mains the relay is permanently activated, that is the ARMATURE (shown as A in Fig. 2) is in the NO or **N**ormally **O**pen position. The instant that the unit is disconnected from the mains, by simply unplugging or by way of a power-cut, the relay cuts out and the armature swings to position NC or **N**ormally **C**losed, thus completing the 12 volt heater circuit.

Needless to say, the reverse sequence of events takes place when the mains comes on again.

Construction

All the components listed, or their direct equivalents, are obtainable from any good radio component shop.

The wiring should be done on a small piece of S.R.B.P. component board. This is a board with small holes drilled at regular intervals to form a matrix. Components are placed on top and wiring is done underneath.

Ensure that the unit is adequately fused. Fuse ratings may vary with the type of transformer used, and the constructor should experiment with different ratings of fuses to obtain a suitable value. 50mA (milli amperes) was found to be a satisfactory value for FS1 in the unit I constructed.

I would strongly suggest building the unit into a case. If an aluminium or metal container is used ENSURE IT IS EARTHED and that the mains side is completely insulated from the case and the 6 volt supply.

I cannot stress strongly enough the importance of an electrically SAFE job of work, as the unit may well be plugged into the mains on standby for literally months on end (perhaps years).

Water is a very good conductor, so mount the unit well away from the aquarium, preferably well above it and to one side.

I apologise to readers who already have a knowledge of electronics, but I am writing this for those people with little experience of the field.

Below is a table giving the current ratings of RLA1 relay contacts for use with corresponding heater power consumption. Also given is the approximate life expectancy in hours, between charges, of a fully charged 30 Ampere Hour car battery.

Power of 12V heater in Watts	Minimum relay contact rating	Approx. life in hours obtained from a 30A/Hr Battery
10	2 Amps	36
20	3 Amps	18
30	4 Amps	12
40	5 Amps	9
50	6 Amps	7
60	7 Amps	6
70	8 Amps	5
80	8 Amps	4½
90	9 Amps	4
100	10 Amps	3½

A modification may be made to the unit to enable an air pump to be switched in as well as the heater. A slight modification is also required to the pump. This is shown below in Fig. 3 as two wires from the relay to the ON-OFF switch on the air pump.

The pump to which I refer is a *Norris Shakespeare* retailing at £2·88+V.A.T. It may be obtained from the suppliers already mentioned.

A further modification to this particular pump *only* may be made as shown by the dotted line connections in Fig. 3. A 33ohm wire-wound resistor is placed in series with the motor enabling the pump to be operated from the 12 volt car battery. This will save the cost of dry batteries.

This resistor must be rated at 10 Watts MINIMUM power dissipation. Even a 10 Watt resistor becomes very hot, so mount it in a well-ventilated case and NOT in the plastic body of the air pump.

Note: By modifying the air pump one is invalidating its respective guarantee.

Although this article is intended only as a guide, I hope it will give the more ambitious of you room to experiment. I also hope that it will alleviate some of the gloom associated with our yearly power-cuts.

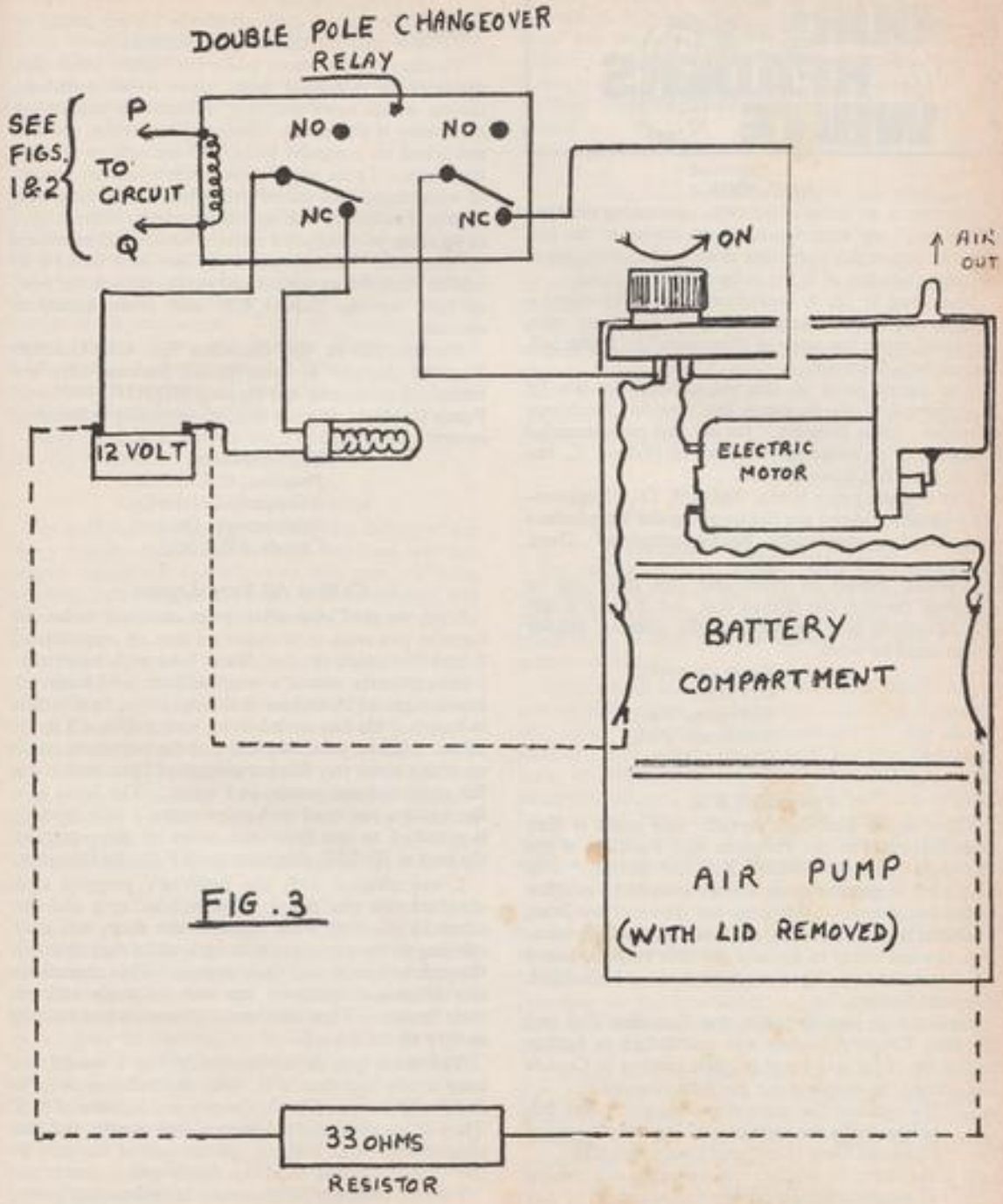

DOUBLE POLE CHANGEOVER RELAY
SEE FIGS. 1&2
P
TO CIRCUIT
Q
NO
NO
NC
NC
ON
AIR OUT
12 VOLT
ELECTRIC MOTOR
BATTERY COMPARTMENT
AIR PUMP
(WITH LID REMOVED)
33 OHMS
RESISTOR

FIG. 3

OUR READERS WRITE

NOT NEW

Further to my letter of the 18th, concerning the drug "Masoten," my attention has been drawn to the fact that the use of this particular drug in the treatment of external parasites of fishes is by no means novel.

The drug is (2, 2, 2-trichloro-1-hydroxy-ethyl)—phosphonic acid-dimethyl ester, and is, or was, marketed under the name of "Neguvon" by Bayer AG, Leverkusen, Germany.

The original work on this use of the drug was by D. Bailôsoff at the Research Institute for Veterinary Medicine, Sofia, Bulgaria. Its use and recommended dosage is to be found in "Diseases of Fishes," C. van Duijn Jnr., 2nd Edition, 1967.

The original paper being, Bailôsoff, D., "Neguvon-ein wirksames Mittel zur Bekämpfung der Karpfenlaus und sonstiger parasitärer Fischkrankheiten," Deut. Fischereie, Z., 10, 181 (1963).

Warning should be given that this drug can be absorbed through the human skin and if there is any risk of coming into contact with the solution, rubber gloves must be worn.

Yours sincerely,
D. Cook,
48 Peplins Way,
Brookmans Park,
Hatfield, Herts.

The C.K.G.K.S.

Allow me to introduce myself. My name is Ken Richards and I'm the President and Founder of the Canadian Koi and Goldfish Keepers' Society. I've been a koi keeper for about 4 years now, and a goldfish owner for 2½ years. After my koi spawned last June, I decided that it was time that Canada had an organisation devoted solely to koi and goldfish keepers, hence the formation of the Canadian Koi and Goldfish Keepers' Society.

Founded in January 1974, the Canadian Koi and Goldfish Keepers' Society was established to further the hobby of koi and fancy goldfish keeping in Canada and abroad, by carrying out the following goals:

1. To educate the general public and other fish hobbyists to the existence of Japanese Imperial Coloured Carp (Koi), and Fancy Goldfish;
2. To strive to achieve the breeding and raising of a constant high quality and standard of Koi and Goldfish;
3. To develop new and fancier varieties of Koi and Goldfish, and;
4. To maintain high standards in the hobby of Koi and Goldfish keeping worldwide.

To carry out the above goals, the Society holds club meetings on a regular basis, open to all members, during which news and new information concerning the hobby is presented. Society newsletters, are also published on a regular basis, and are sent to all club members. These newsletters contain written reports of spawnings, pool construction, tips on feeding, and stories of members' fish and their interests in the hobby, in an effort to maintain a contact between all members in the club. Society members are also invited to exhibit their fish at various shows throughout the year, as held by the C.K.G.K.S. and other aquarium societies.

Membership in the Canadian Koi and Goldfish Keepers' Society is open to all persons who are interested in owning and keeping NISHIKI KOI and Fancy Goldfish, whether they are currently fishkeepers or not.

Ken Richards,
President, C.K.G.K.S.,
6 Gooderham Drive,
Scarborough, Ontario,
Canada, M1R 3G5

Calling All Frog-Lovers

I am so glad that after your excellent series on Reptiles you seem to be making a start on amphibians. I read the article on the clawed toad with interest as I have recently started a small collection of frogs. I first bought an American bull-frog, about four inches in length. He has settled down very well in a 3 ft. × 12 in. × 15 in. tank, one third of the bottom is taken up with a water tray filled to a depth of 2½ in. with some flat moss covered stones and water. The hood is a flat wooden one lined with polystyrene, a bulb (green), is attached to the hood and is on all day—keeping the tank at 70-75°F, dropping to 65 F during the night.

I was pleased with the bullfrog's progress so I obtained two tree frogs. One is 3 in. long and the other 2½ in., both were white in the shop, but after clinging to the aquarium side for a while they changed through to lemon and then orange. This chameleon like behaviour fascinates me and definitely adds to their beauty. They also become brown when feeding as they sit on the soil.

The three get on harmoniously but I would not keep a frog less than 2 in. with the bullfrog as he is rather a glutton and has to be rationed because of this. They all eat maggots, mealworms and worms, and also bluebottles. The bullfrog spends half of his time in the "pond" but the tree frogs rarely spend time in it.

I would certainly be interested in exchanging letters with anyone else who keeps or is interested in "foreign"

frogs and toads. I have also kept red-eared terrapins, Spanish terrapins and young pond tortoises for two years and a tank of tropical fish. I would be grateful if you could let me have the titles of any books on the frogs I have mentioned.

I look forward to more articles on amphibians, and of course!, the rest of your magazine.

JULIA KIRKLAND,
4 Percy Terrace,
Alexandra Road,
Lipson Vale, Plymouth.

P.S.—I have also "looked after" rat snakes, rock pythons, monitors, royal pythons, zonures, and most of the more commonly imported reptiles. I write this because most men seem to regard women interested in tropical fish, let alone reptiles, with tolerance bordering on amusement. I am 22, intelligent, and always ready to learn and discuss. Please let's have a bit more equality in these hobbies. I'm sure it would benefit everyone. (I'm glad to see the '*Aquarist*' publishes letters from women!).

Sorry the P.S. is so long but I'm sure many women feel like "outsiders" keeping fish, etc.

Calling All Herpetologists

Up until this month I have been the Editor of the Fancy Guppy Association Journal, but have now not offered myself for re-election to this post. I have, however, been elected Secretary and Newsletter and Journal Editor of the International Herpetological Society.

In this new post I shall be producing a monthly Newsletter for the Society and a new club magazine internally printed and sent free to all I.H.S. members, called the "Herptile." The first edition is now in print and there are some copies left for members who join over the next month or two.

As yours is the only nationally available commercially printed magazine covering our hobby I should be most grateful if you could publicise the above information as we are anxious to expand our membership.

Briefly the Society meets on the first Saturday in every month at the Fazeley Village Hall, Fazeley, Nr. Tamworth, Staffs., where we almost invariably have a good speaker or a slide show. For the April 6th meeting we have our Vice Chairman, David Turnbull, speaking on "Tortoises and Terrapins" and for our May 4th meeting we have John Coborn of the Cotswold Wild Life Park, who will give a combined talk and slide show entitled "Reptiles and Amphibians of the Cotswold Wild Life Park." At both these meetings new members will be welcome. Our subscriptions are as follows:—A. Single Adult over 18 years—£2. B. Family Membership—£2·50. C. Junior and Student—£1. D. Overseas membership—£2. It is intended that the "Herptile" shall be produced intermittently as material becomes available, possibly not more than four times a year and the Newsletter will contain details of past meetings for those who were not present, news of recent committee meetings and details of forthcoming speakers, society outings, etc.

Many thanks in advance for any help you are able to give us.

MALCOLM DELINGPOLE,
Secretary,
International Herpetological Socy.

Book Worms

Would you allow me, through your letters page, to make a plea on behalf of the Abingdon Aquarist Society.

We have just started our own club library. If any readers have any books relevant to fish-keeping which they no longer want I would be very grateful if they could let us have them. I would be happy to refund the postage. Please send to 16 Morrell Crescent, Littlemore, Oxford.

G. R. HALL,
Secretary,
Abingdon A.S.

Coldwater Queries Feb '74

Mr. Boarder's reply to the reader who asked for comments concerning the progeny of shubunkins he had bred, which had among them bronze, pink with black eyes, as well as blue marked fish, was I feel, rather misleading.

Any breeder should expect a similar result when mating shubunking × shubunkin. Like all nacreous or "calico" goldfish, shubunkins are of the intermediate scale group of goldfish and by Mendel's Law of Inheritance should produce 50 per cent nacreous, 25 per cent metallics, which are usually bronze, and 25 per cent matt fish, often pink with black eyes. This is of course a generalisation, as some will be a mixture of the above types.

It is true, however, that it is wise to breed from shubunkins of well established strains though somewhat imperfect, rather than pleasant looking goldfish of dubious ancestry.

No doubt someone from the Goldfish Society may comment on the interesting pseudo-matts which Mr. Boarder hasn't had opportunity to see, referred to by another reader.

I would also add that the very occasional "shark fin" and other deviations do appear in even well-established strains. It is because of this tendency towards "sports" that the wide variety of goldfish varieties have been possible.

Goldfish Breeder,
(Name and address supplied).

Coldwater Fishkeeping

THE BREEDING SEASON

by Arthur Boarder

THERE are several important tasks to be attended to at the beginning of the breeding season. If proper arrangements are made early in the season, time will be saved later on and the chances of a good result will be increased. As for the common goldfish, I do not think that it is worth going to any special trouble for this purpose as usually at least a few youngsters may be expected to appear in the garden pond where there are breeding size fishes.

It is the fancy goldfish breeder who will be expected to take special trouble to ensure that he produces some good specimens. Which ever variety of fancy goldfish the breeder has in mind I consider that few if any really good fish will be bred and reared unless special conditions are provided. To expect that many good fancy goldfish will appear in the garden pond where there may be several varieties present, is expecting too much, even the impossible. Therefore it is imperative for the specialist breeder to make special arrangements so that he can, at least, spawn and then rear the fish under conditions which will ensure that he has a good chance of rearing some good types.

It is well known among breeders that all the fancy varieties of goldfish will interbreed and so the necessity of some form of controlled breeding is necessary. This does not mean that several varieties cannot winter and live together in the garden pond. As long as the fishes which are actually needed for breeding are separated before they actually spawn, there will be no chance of there being any cross-bred youngsters. If the fish were live-bearers there would be an almost certain chance that some of the young could be cross-breds, but as the eggs of the female fish are only fertilised after they are laid, there can be no crosses if the spawning fish are separated from the others before the spawning takes place.

The treatment of the spawners previous to the chasing can be very important. No fish are likely to spawn unless they are in good condition. After a winter in the outdoor pond some of the fish may appear sluggish. This may be due to the fact that the water in the pond has become unfit. Few ponds are likely to go through the winter without becoming somewhat foul. A good change of water will prove beneficial to the fish, and the amount to be changed will depend on the state of the water. However fit the fish may be they are not likely to breed unless the water in the pond is well oxygenated. Providing all is well the fish may be fed on garden worms, and as long as they are taken avidly, there appears to be no limit to the number which may be given. Some flake or the usual dried food can also be given as long as the first little piece is taken quickly.

Having taken all necessary steps to see that the fish are in good condition and the pond water is well oxygenated, the next task will be to see that all necessary apparatus required is in good order. Special hatching and rearing tanks are essential and these should be inspected, cleaned thoroughly and got ready in good time for the first spawnings. Deep containers are unnecessary and any not more than nine inches deep are sufficient. Small plastic baths or bowls can be used but I do not like all glass tanks for the purpose. These, if exposed to direct sunlight, can get too hot for the good of the eggs or fry. Opaque sided containers are better.

The next requirement is the necessary spawning medium, that is, a good type of receptacle for the eggs. I use one type of water plant, Hornwort, (*Ceratophyllum demersum*), and find it very good. It has more than one advantage over other water plants for the purpose. It has many very fine leaves on which the

eggs will adhere well, and as it has no roots it can be introduced into a hatching tank which has no base compost. I think that this is most important as I find that any sand or gravel in such a tank is asking for trouble in that decomposition can take place there and foul the water and the cleaning of the tank is made much more difficult. Other water plants can be used if hornwort is not available but the finer leaved types are the best as they are likely to hold the eggs more safely. It must be remembered that as the eggs are laid there are often other fish just hanging around to eat the eggs, and the more dense the foliage the less chance is there of eggs being eaten before they can be rescued.

The next part of the preparation is to make sure that, if any heating and aeration is to be used, all the necessary apparatus is in good order. Test all heaters to make sure that they are working and also check thermostats to make certain that they are adjusted to give the temperature you require. I find that one of 70°F., is sufficient as during most breeding seasons there is plenty of sunshine to raise the temperature higher than this, but a minimum of 70°F. is quite a good one to ensure a fairly quick hatch. Of course, one is not bound to use artificial heat at all, but I have found that it is beneficial to get a fairly rapid hatch of from three and a half to four days. Now the aeration. This is not essential, but I am sure that it pays to use this if possible. There is no doubt that eggs require plenty of oxygen to assist in their development. The proof of this can be found in the way that many types of fishes fan their eggs whilst they are incubating.

Check all air tubes and make sure that there are no blocks where a compressor has been used the year before. By warming the tube and pressing with the fingers the tube may be restored to its normal shape. See that air stones are working properly and sometimes a scraping of all the sides will give a better performance. If artificial heating is used then I consider that it is imperative to use aeration, as the warmer water will lose much of the oxygen so necessary for the eggs and fry.

Now it is essential to obtain a supply of Liquifry as a first feed for the fry, I do not use any cultivated *infusoria* nowadays, as I find that Liquifry is sufficient for the fry up to a week after they are free swimming, at least. A little Liquifry can be added to the hatching tank water a day after the eggs are laid. This will ensure that some *infusoria* is likely to have been produced in the water prior to the fry hatching. It is in the early days of the life of the fry when the presence of plenty of food of the right size is available that the rate of growth is determined.

Some breeders like to take a pair of fish from the pond and spawn them in a tank. This is a good idea if special care is taken. Any spawning in the confined space of a tank is likely to produce more fertile eggs than could have been obtained from the same pair in the pond. However, there is a danger with this method. If a pair of fish is placed in a very heavily planted tank, it is possible that they may be dead in the morning. This is because the fish have been used to plenty of oxygen in the pond and when placed in the restricted water of the tank they are not able to obtain sufficient oxygen. It must be realised that although the plants can assist in producing oxygen in the daylight they give off carbon dioxide during the hours of darkness. If this method is used then some fairly heavy aeration should be supplied during the night. This is where many fishkeepers go wrong; they keep the aeration going all day when it is not so important to use it and then shut it off at night when it is essential.

If fish are placed in a tank for spawning, it will be necessary to replace them in the pond when spawning has taken place. Finally do not expect your fish to spawn unless they are in good condition and the water is very well oxygenated.

THE BANDED HUMBUG

by H. G. B. and Q. G. B. Gilpin

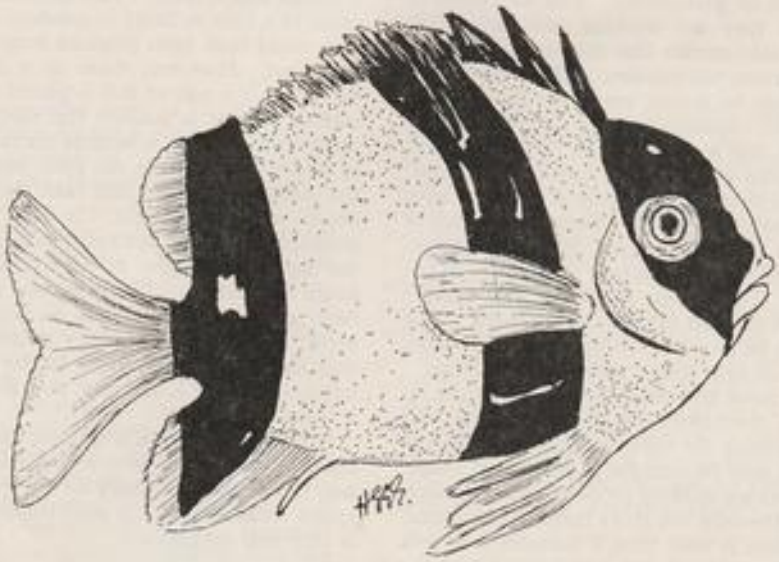
ALTHOUGH lacking the extravagantly vivid coloration of so many of the small, tropical marine fish, desirable for inclusion in aquaria *Dascyllus aruanus*, commonly called the White-tailed Damsel, Banded Humbug and occasionally the White-tailed Footballer, is strikingly handsome. Its strongly made white body is transversed by three broad, black bars. The two anterior bars slope from the ventral to the dorsal surface and the third is vertical. The most forward bar extends from the mouth, through the eye to the beginning of the dorsal fin and the other two bars extend to the edge of the dorsal fin. The black of the middle bar continues through to the pelvic fins.

As implied by one of its common names, *D. aruanus* has a white caudal fin, which distinguishes it from its close relative the black-tailed *D. melanurus*. *Aruanus* also nearly resembles *D. arcuatus*. This latter fish also

has a white tail but can be identified by the presence of red edges on the black bars.

Widely ranging the shallow waters of the Indo-Pacific seas, the White-tailed Damsel remains a manageable size in aquaria, reaching a maximum length of three and a half inches although some authorities state that in its native haunts it may grow to six inches.

About twelve months ago we bought a pair of these attractive little fish—inexpensive considering the comparatively high prices necessarily charged for tropical marines—and installed them in an aquarium, forty inches by twelve inches by fifteen inches, kept at 75°F. and furnished with large pieces of coral, set on a floor covering of coral sand. The aquarium, well aerated and lighted, was equipped with an underground filter and air lift converter to ensure constantly moving water.



The Damsels, each slightly under two inches long, together with four one-and-a-half-inch Pyjama Cardinals, were introduced to the previously unoccupied aquarium. At first the Damsels were highly nervous and apparently completely bewildered by their unfamiliar surroundings. The slightest movement sent them scurrying out of sight behind a lump of coral. The situation rapidly improved, however, as soon as they had had time to settle themselves, each in its own private lurking place, well away from the other, where they were invisible to an outside observer. Once established in their own particular territories, any invasion of which was strongly resented, they gained confidence and could frequently be seen peering around the edges of their domains or darting briefly from one end of the tank to the other. The duration of these excursions away from their retreats gradually lengthened and it was not long before they were swimming freely in the open parts of the aquarium.

In view of the reputation for pugnacity justly accorded to White-tailed Damsels and their close relatives, a careful watch was kept on the aquarium. They showed no signs of aggression towards the Cardinals nor to a four-and-a-half-inch Batfish subsequently added to the community, probably because both these species kept to the free-swimming parts of the aquarium and did not invade the quarters reserved by the Damsels for themselves. An attack on a one-and-a-half-inch Cleaner Wrasse (introduced in the hope that it would reduce a mild attack of white spot which developed on the Batfish), however, was blamed on the Damsels, this fish being more likely to have trespassed in prohibited areas.

Provided precautions are taken to prevent them damaging smaller or weaker species, White-tailed Damsels are ideal for a beginner to commence with as a start for his collection, as, apart from their willingness to feed on a wide variety of nutrients, they will tolerate a certain amount of early mis-management, such as a higher nitrite content of the water than is normally desirable and a considerable fluctuation of temperature, provided it does not fall below 70°F.

White-tailed Damsels are amongst the easiest fish to feed and will take any of the foods normally offered to marines including dried and frozen foods. Their greediness in this respect can prove useful in a community tank as they consume unconsidered trifles ignored by the other fish and consequently reduce the possibility of decomposing organic matter fouling the water.

OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE
All queries MUST be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

COLDWATER QUERIES

by Arthur Boarder

I am having trouble with some of my goldfish in a garden pond. They have small circular wounds on their sides which are suffused with blood at the edges. What has caused these wounds? I have no fish which are 'fighters' in the pond. I feed with packet foods and *Daphnia* from a local pet shop.

From your description of the wounds I think that they have been caused by fish lice, *Argulus*. These pests suck the blood etc., from a fish and when the wound becomes festering they leave and find a fresh host. The lice are practically transparent, not much more than an $\frac{1}{2}$ of an inch in diameter, and resemble a miniature plaice. They can swim freely and the female lays eggs on stones or sides of ponds. When the young hatch out they must find a host or they would soon die. This is the second letter I have had in two days about the same pests. In the second case the owner of the pond had treated it with permanganate of potash. This idea is useless as anything strong enough to kill the lice would also kill the fishes. Whatever chemical was put in a pond it would be very difficult to estimate the correct dosage. So many other factors have a bearing on the case, such as the amount of mulm and water plants in the pond, apart from the volume of the water, not easy to estimate with an irregular shaped pond.

Many years ago I had an infestation of the pest and got rid of them by catching all the fish and examining them carefully. If the pests were seen, the fish was dipped into a solution of a half teaspoon of Dettol or T.C.P. to a gallon of water. The lice left the fish immediately, went into a spiral dive to the bottom and died. The fish must not be left in the solution for more than a minute and must be removed to fresh water if it turns over. The fish will then recover. If any more pests were suspected later on the treatment can be repeated. When examining a fish for pests pay particular attention to the join of fins to the body, as this is where they can hide.

I would like to know if I could keep three goldfish with, four guppies, two bronze catfish and a sucker loach in a plastic bow fronted tank, 24 × 12 × 12in. Their lengths are 3½in. average. If not, what size tank should I use?

A tank the size of yours will hold comfortably, twelve inches of body length of fish. As the tank is bow fronted it could take a little more but not enough to make much difference. You are mixing tropical with coldwater fishes but as long as the tank is in a living room where the temperature does not fall below 62°F, then all may be well. However surely your guppies are not 3½in. long?

Could you please tell me the size tank I could use for Koi fish? I could go to 5ft. × 3ft., but no more.

The size of the necessary tank would depend entirely on the sizes of the fish you intend to keep and the number. Although the usual rule is to allow 24 square inches of surface area of water for each inch of body of fish, in the case of Koi you would be well advised to keep below this rule as Koi can grow fairly quickly. In a tank the size you suggest you could have about 90 inches of fish, but keep to a fairly small size as large Koi might not look as well as a few more smaller ones in the tank.

I have three coldwater tanks of various fish. Can I feed them on fresh shrimps from the fishmongers?

You could certainly feed the shrimps to your fish but it would be as well to wash them well first. If you feed continuously with them it is possible to get a gradual build-up of salt in the tank which could become harmful to the fish. If you bake them in an oven (when the lady of the house is out) you can then crush them up and store in a well stoppered jar for

future use. Do not feed exclusively on them but use as an occasional change of diet.

I have a coldwater tank and have been through most of the troubles one might expect and have gradually overcome them. However, there is one problem I cannot solve. That is green *algae* in the tank. I have used recommended tablets to clear the tank but all to no purpose. What do you suggest?

I am rather dubious about using any form of chemical in a tank as the *algae* is just another form of plant life. Therefore anything which could kill the *algae* could also kill the useful plants. An excessive growth of *algae* can be caused by too few growing water plants; too little light and over-feeding. Try more light, more plants and do not feed at all for a week.

I have bought a fish called a blue bitterling and have been told that it is a coldwater fish. What will it grow to and feed on?

The bitterling (*Rhodeus sericeus*) is a coldwater fish found in Central and Eastern Europe and Asia Minor. There is plenty of evidence that some have been placed in factory ponds in this country where they have bred. The female fish, when breeding, inserts a tube into a Swan mussel and lays its eggs therein. They are fertilised by the male and the sperms can be drawn in by the siphon of the mussel. The fish is not faddy about food and will learn to take most foods, both live and dried as given to goldfish. It does not exceed 9cm., when fully grown.

I have bought some goldfish recently and I would like to breed them. Can you tell me how to sex them and give me any more information? My age is eight years.

I think that before you try to breed the fish you get some experience at keeping them alive and healthy. I was only five when I had my first tank but was never able to breed goldfish until many years after and then not in a tank. Some goldfish are not easy to sex. Usually near the breeding season, April to August roughly, the female fish becomes fatter in the body as the developed eggs take up more space than does the milt of the male fish. The male fish can show small white raised tubercles on the gill plates and sometimes on the front of the pectoral fins. Try to get books from your public library or get one as a present and study the subject.

I have a fourteen-year-old goldfish which swims with the tail held up and cannot seem to swim normally. I have seen it eating the gravel at the bottom of the tank. Do you think that it could have swallowed a stone or two?

Your goldfish is getting old and although some may live to over twenty years of age it depends on the conditions under which it has been kept throughout its life. It sounds like a touch of swim-bladder disorder and it may not be able to cure it at its age. Try it in shallow water which is about 70°F, and do not feed for at least a week. I do not think that the fish was eating the gravel. Most goldfish after a feed go over the gravel and suck it up, and after sorting it for food spit out the stones.

When we go away for a fortnight in the summer my neighbour has promised to feed my goldfish in a tank. What instructions should I give?

The really safe way to leave fish when on holiday is to just say goodbye and leave it at that. For at least the last twenty-eight years I have left tanks of coldwater fish with no extra food or attention. I have never had a fish ail through this treatment and have always found that the tanks are cleaner, as far as *algae* is concerned than when I went away. Your fish will not starve in their tank if left for a month or more. I have found a fish in a tank which I thought I had emptied, after eight months, and it has been in perfect condition, having only found food on the plants. If your neighbour, especially if not an experienced aquarist, looks after your fish it is almost certain that they will be over-fed and be dead on your return.

I have a moor which lies at the top of the water on its side, but swims away normally when disturbed. Its fins are rather mis-shapen. Do you think that this is the reason?

If the fish has suddenly taken up this position it is not likely that the finnage shape is to blame. It is probable that the fish has had a chill or that there is a quantity of gas inside it. Try the fish in warmer water, say up to 65°F and do not feed any dried food for a week. After a day offer live food and the fish may recover.

Can you give me any ideas as to how to make our garden pool toddler proof? The child is nearly two and I do not want to fill the pool in.

As the water in your pool is only 1½ feet deep I think that you could run out much of the water and leave just under a foot. This should not cause any trouble. If you do not wish to do this then you will have to make a small fence round the pool until the child grows up a bit. A few stout stakes round the pond with some green plastic netting about three feet high should do the trick. See that the netting is not coarse enough to allow the child's foot to get in the holes.

Can you help me with advice about a pool liner. I want to get one which will be outside the usual sizes stocked by dealers. I shall therefore be obliged to you if you can let me have the address of a dealer who could supply out-size liners?

The best types of liners can be supplied to any size required by the pondkeeper. I will enclose two addresses to which you may write and ask for a catalogue from the second firm, as they issue a very comprehensive one of liners and all accessories.

I have kept goldfish in my pond for ten years without any losses. Now several have died. Their bodies appear swollen but there are no signs of fungus or injury to them. They lie on their sides before dying and after death a thin blood coloured fluid comes from the vent. What is the trouble as my pond is fed from a spring and aerated frequently by fountain and pump?

From your description of the dead fish it seems as if they have an internal disease or some pests which have caused the death. You state that the water is clear but I do not like the idea of the water being supplied from the stream. Although the water may look clear it may also contain many types of disease and pest. I know that it sounds very nice to say that the spring water looks clear, but some germs and bacteria are too small to be seen with the naked eye. I would empty the water from the pond, refill with tap-water and cut off the stream water. However, if the remaining fish have already been infested they may not recover. If the fish have flukes or forms of tape worm inside them it may help if you can feed them on worm cake as given to cats and dogs for clearing them of worms.

I have recently bought three small fish called Golden Medaka which the shopkeeper told me were coldwater fishes. Can you tell me anything about them? I have just got your book "Coldwater Fishkeeping", an excellent book well worth more than £1·00. However there is nothing in it about the Golden Medaka, why is this?

The golden medaka, *Oryzias latipes* is stated by most authorities as a tropical fish and so it was not included in my book I, personally, would call it an exotic fish as, like so many other so-called tropicals, it can stand extremes of temperature It can be kept at temperatures as low as 55°F, and up to 80°F.

This fish is commonly known as the Japanese rice fish and although it can be kept at temperatures which suit fancy goldfish, it usually breeds at 75°F. I have answered queries in this magazine before on this fish and you will find an article by Jack Hems on the fish in question in the November, 1973 issue of this book.

I have a 36 inch tank well planted, with 12 fish approximateiy 1-1½ inches long. I am having difficulty in keeping the water clear. Should I have an under-water filter?

As you tank will hold about 18 inches of body length of fish, you do not appear to be over-stocking and the use of a filter should not be necessary. Change the water for fresh and then do not feed the fish at all for a week. I think that you will find that the water will remain clear. Once you start feeding only give very small amounts so that every piece is cleared up by the fish before you give any more. The cooler the water the less food you should give. The water will keep clear as long as you do not over-feed. The goldfish will not come to any harm if not fed by you for a week or two. If over-feeding is not the cause of your cloudy water, why is it that I can keep a tank of coldwater fish with no filter or aerator for years with absolutely crystal clear water? The tank only needs a weekly servicing when the front glass is cleaned. I am always careful to give only sufficient food for it to be eaten almost immediately.

I have a pond, 12 ft. × 6 ft., by 1½-3½ ft. deep. It has been in existence for 15 years and I have a number of goldfish, shubunkins and orfe. Last year all the orfe died within a week and yet the goldfish were all right. It was not through over-feeding. Is there a disease which affects orfe and not other fishes?

You did not state the time of year when the orfe died but I suspect that it was when the weather was very warm and thundery. Orfe are essentially a river fish and must have plenty of oxygen, especially if they are rather large fish. They will soon die in water lacking in oxygen whilst other fishes appear to be unaffected. I expect that your orfe showed no signs of disease or injury when they died. If fresh water could have been played on the orfe whilst they were lying on their sides on the surface they may have recovered.

TROPICAL QUERIES

by Jack Hems

I should like to know how to care for the marbled helogenes and whether it can be bred in the home aquarium?

Helogenes marmoratus, to give this catfish its scientific name, is a furtive species that makes an excellent scavenger, is non-offensive and does best in clean water kept at a temperature in the middle to upper seventies (°F). Both Professor Sterba and the anonymous contributor of the note on this species in the loose-leaf edition of *Exotic Tropical Fishes* tell us that it attains a length of 4 in. Food such as various small worms, raw red meat, and the like, should be dropped into its tank last thing at night, that is a few seconds before all the lights are

put out or else the fish will soon die of starvation.

Please give me some information on the genus *Pseudotropheus* cichlids which, from what I have seen of them in various dealers' tanks, appear to be possessed of great character and nothing short of brilliant coloration.

What better than to quote from *A Guide to Freshwater Aquarium Fishes*, the latest book I have written in collaboration with G. F. Hervey. "All are small fishes that reach a length of 3 or 4 inches but they are aggressive. They are at their best in hard and alkaline water, eat anything, and may be kept and cared for in the regular way of cichlids." *P. auratus*, one of the most readily available species, is an easy-to-breed mouthbrooder.

I placed some rocks picked up from the seashore in my aquarium and since doing so have lost several fish. Do you think I can attribute these losses to the rocks?

Rocks from a seashore are always risky because they are impregnated with salt and must be soaked over a long period in several changes of water to remove the brine. Then again, any stones or rocks used to add decoration to a tank must be of a non-disintegrating nature and lime-free.

Would a three-foot tank make a suitable home for a pair of Jack Dempsey fish?

Yes, provided no other fishes are introduced and the tank is furnished with some tall pieces of non-calcareous stone to afford retiring places for one or both fish.

I own a 48 in. × 15 in. × 12 in. tank in which I placed a well-known undergravel filter covered with a layer of grit. Yet I am most disappointed with the state of the water. It is habitually hazy and I have had to change it several times. I am beginning to doubt the claims made for u.g. filtration, for my tank is not overstocked with fish. All I have in it are four largish sharks, a clarias catfish and a few other mixed species.

Do not blame your filter for the hazy water but the inclusion of a clarias catfish. Species of *Clarias* are great burrowers and disturbers of the floor covering. The water will not stay clear until you remove the catfish or add a good box-type filter filled with synthetic fibres and carbon.

Kindly provide me with some information on a characin called *Gymnocorymbus thayeri*.

G. thayeri is a paler edition of the better-known black widow fish or *G. ternetzi*, but while *G. ternetzi* grows to a length of some 3 in. in the natural state *G. thayeri*, according to one authoritative writer, remains smaller, that is in the wild. In the aquarium, however, *G. thayeri* is said to attain a larger size than tank-bred *G. ternetzi*. *G. thayeri* ranges over much about the same areas of tropical South America as does *G. ternetzi* and there appears to be some doubt whether it is a distinct species or merely a sub-species or colour form of the ordinary black widow. *G. thayeri* eats almost anything but flourishes best on copious feedings of live food. It has not proved difficult to breed in captivity.

I have been informed by a correspondent who is at present living in Bangkok that there is a local fish called a salit that makes a good aquarium fish. Could you please supply me with the scientific name of the salit and whether it has been introduced into this country under another name?

The inhabitants of Thailand apply the name salit to certain fishes of the genus *Trichogaster*. There are several species and colour forms of *Trichogaster* native to Thailand and most of them have been available to aquarists in this country for more than forty years.

I should like to know the maximum length and behaviour of the pink-tailed characin.

The pink-tailed characin (*Chalceus macrolepidotus*) attains a length in the neighbourhood of 8 in. and is not an aggressive species though commonsense would suggest that it should be kept with fishes of about its own size. It is a frequenter of the middle and upper levels of the water and, because it will jump for food or when frightened by some disturbance in the aquarium, the top of its tank must not be left uncovered.

I obtained a pair of mollies some months ago but up to the time of writing, the female remains the same body shape as when I bought her. Do you think she is infertile?

I doubt it. Mollies are never such rapid producers of fry as say the guppy or platy and may go for months before producing young. Have patience and give your fish a good overhead light to promote the growth of *algae*, introduce some wheat-germ food into their mixed diet, and maintain a temperature of about 75°F (24°C). Slightly saline water might help too.

What is a dolphin cichlid?

The so-called dolphin cichlid is a member of the genus *Aequidens* and is known to science as *A. itanyi*. It is one of the less common smaller cichlids, very accommodating, but given to chewing at plants. It will accept most foods and is reasonably well-behaved in a roomy community tank, that is when not engaged in bringing up a family.

How can I work out the capacity in gallons of various largish tanks?

Multiply the length of the tank by the width. Then multiply this by the depth. That is in feet. Now multiply the total by 6¼.

What exotic fishes could I hope to keep and breed in a thickly planted and glass-covered

kitchen sink placed outdoors?

I presume you mean during the summer months? Assuming I am correct, then you should do quite well with Australian rainbow fish (*Melanotaenia nigrans*), the White Cloud Mountain minnow, and the common paradise fish (*Macropodus opercularis*). There are others too such as *Oryzias latipes* popularly known as the medaka. A word of warning: lightly screen the sink with some greenery or close-meshed plastic netting if it receives long hours of direct sunlight.

I should like to know what makes the best food for the long-nosed loach, its scientific name, country of origin, and does it make a suitable species for a community tank?

Various small worms and tiny pieces of meat are among the best foods for this fish, that goes under the formal name of *Acanthopsis choirorhynchus*, hails from the Great Sunda Islands and, if you do not mind its burrowing habits and lack of any great activity, does well enough in a community tank.

Is the livebearing half-beak easy to breed?

Not without a great deal of care and attention. Among its essential requirements are shallow water, with a little non-iodized salt added. The fry must be protected from the cannibalistic and fast-moving parents. Therefore the aquarium must be furnished with tangles of floating vegetation. The fry need tiny livefood which rises to, or frequents the surface such as gnat larvae, baby *Daphnia* or minute worms placed in a fabric bag or plastic dispenser just touching the water.

What should I look for in the firemouth cichlid in order to tell the sexes apart?

In well-grown fish of about equal size, the male has longer and more pointed dorsal and anal fins and brighter colours than the female.

Please give some information about *Tilapia microcephala*.

This fish, according to present day taxonomists, should be called *T. heudelotii*. *T. heudelotii* attains a length of about a foot, comes from the fresh and brackish waters of coastal West Africa, eats anything, is a mouthbrooder, and requires a temperature in the neighbourhood of 75°F (24°C).

FEEDING THE BIG FISH *(Continued from page 59)*

almost continuously (often eating at the same time). They should then be provided with an egg case receptacle, a plastic dish 4 in. × 4 in. × 3 in. filled with loose damp sand, into which the female lays her egg-pods. Each egg-pod, and there will be many, contains from 30 to 80 eggs which hatch in 15/18 days. It is essential to keep the sand warm and moist.

The *larvae* dig their way out of the sand, shed their skin and are soon looking for food. The life cycle is as follows:—

Egg incubation, 15/18 days, 'hopper' stage during which the immature insect sheds its skin six times (instars), eight weeks. After last instar the Locust is fully winged, able to fly, and sexually mature. The mature Desert Locust is a handsome creature, usually yellow and black with two pairs of wings, a black barred pair overlay two that are transparent, it will be some 2½ in. long.

A Food Insect

Because of its quick life cycle, rapid growth and proliference, the culture will always contain insects of all sizes, i.e., newly hatched 'hoppers' of only ¼ in. to mature adults. The 'hoppers' can be fed alive on the water surface to all fish with mouths big enough to take them, or to shoaling fish which will pull them to pieces.

Alternately, larger sizes can be killed by dropping in boiling water and cutting up before being dropped in the tanks.

All fish will relish Locusts, Carp, big 'Cats', Fighters, Gouramies, etc., take them whole and alive. They can be pounded in a jar with a little water and fed to both egg-layer and live-bearer fry as a 'meaty' cloud.

Schistocerca gregaria, the Desert Locust, is a well-known laboratory animal. Half a million are bred annually in heated rooms by the Department of Overseas Pest Control. Many zoos breed vast amounts to feed to small mammals, exotic birds and fish, etc. They are interesting and harmless in captivity, and do not bite. Locusts are also odourless and clean and can safely be handled by anyone. They are available from dealers in all instars and adults at a reasonable price. Remember to keep back some sexually mature adults as future breeders, the life span is approximately one year. There is no need to worry about the odd escapees; being a tropical species they would not for long survive our temperate and inclement weather, but a word of warning: don't let them loose in the greenhouse if you value the foliage of your lovingly tended pot plants!

Footnote

"In 1958 a swarm (of Desert Locusts) in the Somali Republic covered 400 square miles. It is known that there are usually 100 to 200 million Locusts in a single square mile of swarm. This swarm may have contained 40,000 million insects. Such a swarm would require 80,000 tons of food a day."

Enjoy your Locusts as your finny friends surely will!

News from AQUARISTS' SOCIETIES

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

We regret that owing to pressure on space a number of Society Show results have been held over to next month.

THERE were 234 entries at the first open show of the **Catfish Association of Great Britain.** Winners of the Aquarist Gold Pin, The King Trophy for Best Fish in Show and the Ivy Brown Trophy for Best A.O.S. Catfish were Mr. and Mrs. Sharp of Sittingbourne, Kent, with a Microglanis parahybae. Winners of the F.B.A.S. Supreme Championship Class and the Cruickshank Trophy for Best Croydoras or Brochis were Mr. and Mrs. Murphy of Ealing with a Corydoras schwartzi. Highest pointed society was Ealing and the best junior entry belonged to Miss T. Hedges of Bethnal Green. Results: Bagridae: 1, Mrs. S. Elson (S.L.A.S.); 2, L. S. Derrick (Croydon); 3, R. A. Reeves (Croydon); 4, May Nethersell (Riverside). Callichthyidae: 1 and 3, B. Jones (Basingstoke); 2 J. Batts (Ealing); 4, W. F. Sutton (Catfish Ass.). Doradidae: 1, T. Pilsbury (Northampton); 2, Master N. Tully (Torbay); 3, J. Connolly (B.G.A.S.); 4, D. Cholds (Bracknell). Loricariidae: 1, R. Goodson (Roehampton); 2, B. Bissoon (Basingstoke); 3, D. Allison (Hendon); 4, J. Hughes (Roehampton). Mochokidae: 1, Sybil Hedges (B.G.A.S.); 2, M. Strange (Basingstoke); 3, May Nethersell (Riverside); 4, R. Goodson (Roehampton). Pimelodontidae: 1, Mr. and Mrs. Sharp (Catfish Ass.); 2, W. F. Sutton (Catfish Ass); 3, May Nethersell (Riverside); 4, J. Hughes (Roehampton). Schilbeidae: 1, W. H. Onslow (Ealing). Siluridae: 1, June Adams (Catfish Ass.). A.O.S. Catfish: 1, Mr. and Mrs. Guest (Hampstead); 2, May Nethersell (Riverside); 3, J. Hughes (Roehampton). Brochis: 1 and 2, May Nethersell (Riverside); 3, Clive Walker; 4, Doris Winder (East Dulwich). Corydoras 2½" and under (as F.B.A.S. size Sheet): 1 and 3, Mr. and Mrs. Murphy (Ealing); 2, R. C. Burton (S.L.A.S.); 4, L. Brazier (Sudbury). Corydoras over 2½" (as F.B.A.S. size sheet): 1 and 3, J. Hughes (Roehampton); 2, T. Jones (S.L.A.S.); 4, J. Batts (Ealing). Corydoras (not on F.B.A.S. size sheet): 1, Sybil Hedges (B.G.A.S.); 2, B. Bissoon (Basingstoke); 3, W. H. Onslow (Ealing); 4, E. Stainer (S.L.A.S.). A.O.S. Catfish Pairs: 1, D. Allison (Hendon); 2, Pat Lambourne (Roehampton); 3, June Adams (Catfish Ass.); 4, W. H. Onslow (Ealing). Corydoras and Brochis Pairs: 1, L. Brazier (Sudbury); 2, W. H. Onslow (Ealing); 3, J. Hughes (Roehampton); 4, T. Cruickshank (Ealing). Corydoras and Brochis Breeders: 1, P. Moye (Sudbury). Special Class: 1, W. F. Sutton (Catfish Ass.); 2, May Nethersell (Riverside); 3, W. Mason (Rochampton); 4, M. Strange (Basingstoke). The Association wish to thank F.B.A.S. judges Messrs. Brown, Blake, Durrant and Nicoll for their help in reclassifying many of the fish and also Mr. Gordon Howes of the British Museum for identifying many species which were not known.

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OFFICERS of the **Diss and District Fish Keepers Club** are: Chairman: M. Boyce; secretary: M. Butcher; treasurer: B. Elvin; show secretary: P. Hartley; judges: D. Laughlin, J. Hughes. The club is affiliated to F.B.A.S. and East Anglian Federated Aquarists and the meetings are held at the White Horse (Club Room), Market Place, Diss, at 7.45 p.m. on the third Thursday of the month.

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IN the absence of the chairman, the March meeting of the **Gloucester Fishkeeping and Social Club** was conducted by the Treasurer, Mr. T. Collier. The children of members were offered an outing on 26th May to the Cotswold Farm Park during the morning, and in the afternoon a visit to the Cotswold Wildlife Park. A further outing for members and their children on the 7th July is being considered.

Additional members were elected on to the Show committee which has a great deal of work this year, including a Six-a-side show, members Home Aquaria competition and the setting up of a stand for a week during the carnival in Gloucester Park. In addition to all this, it is hoped to extend the additional Home Aquaria competition, which is open to members and non-members alike, to cover a wider area. This competition is organised by the Gloucester Fisheeeping and Social Club in conjunction with the "Barrier Reef".

The speaker for the evening was Mr. Gordon Churchill from Coalpit Heath, Bristol who showed the members slides of previous Home Aquaria competition tanks and commented on each one. This lecture proved most interesting and enlightening to everyone present. Table show winners were, for any variety Barbs, 1, M. Toomey; 2, H. Bartlett; 3, and 4, T. Dismond. Winners of the cold-water fish section: 1, Master R. Bowd; 2 and 3, F. Palfrey and 4, J. Mitchell.

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THE March Meeting of **Southampton A.S.** was very enjoyable for its members because of the subject which Mr. Colin Beets had talked on. The subject being: Gadgets for the Aquarist This ranged from a brine shrimp hatcher to a simple way of cleaning out a show jar successfully.

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MEMBERS of the **Hastings and St. Leonards Aquarium Society** enjoyed a lecture by Barry Funnell, titled "How it all began". He started saying how he began with Goldfish as a schoolboy, but later developed an urge for different fish.

In 1928 he found a fish shop which ordered him fish from London. Part of Mr. Funnell's talk was devoted to the development of Aquarium literature.

He has taken the *Aquarist* for over 40 years and still has all the copies. Three years later his fish house was destroyed by a German bomb. He salvaged some corpses from amongst the debris and they are still in the Natural History Museum at South Kensington. The Table Show (Egglayer pairs) was judged by M. Penfold. The result was: 1, A. Adams; 2, Mrs. M. Griey; 3, Mrs. A. Adams.

The second meeting of the month was devoted to a practical demonstration of the different ways of filtering aquarium water, G. Pryke started with the simple bubble up corner filter continuing to the large power filters.

The table show was live bearers (own breeding). Judged by H. Carey. Result was 1 and 2, Mrs. M. Griey; 3, Mrs. J. French.

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OFFICERS elected at the annual general meeting of the **Goldfish Society of Great Britain** held in March, were: chairman: J. Bundell; secretary: R. Dodkins, 107 Cobham Road, Seven Kings, Ilford Essex; assistant secretary, Mr. J. Herring; show secretary, Mrs. M. Dudley, 163 South Park Road, London, S.W.19; lay member, J. Shirly.

Fortunately for the members who attended the Annual General Meeting, the afternoon was not devoted to society business and for about two hours Mr. R. Esson gave a most interesting lecture entitled "Cosmic clocks" which, as the members found out was in no way connected with astronauts, but referred to "Moon Phases".

There are a growing number of fish breeders who are convinced that there is a link between Moon Phases and the spawning of goldfish. I am sure that a few more members were convinced after Mr. Esson had finished his talk.

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CHANGES of officers of the **Cardiff A.S.** were: chairman, D. Warmeant; secretary, D. Scanlon, 63 Bishops Road, Whitchurch, Cardiff; treasurer, P. Boulch; show secretary, G. Turner. Monthly meetings are held on last Thursday of month, held at the Tredegar Hotel, Clifton Street, Cardiff.

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DETAILS of the training scheme for potential judges were given at the March meeting of the **New Forest A.S.** To enable them to gain practical experience, it was agreed that the Show Secretary invite one to judge the club table show each month.

Mr. J. Jefferies, who had judged the Home Furnished Aquaria competition, made some interesting comments on the various tanks. Results of the competition are as follow: Tropical: 1, A. Williamson; 2, R. Travers; 3, D. Harding; 4, M. Aust. Coldwater: 1 and 2, D. Harding.

The main item of the evening was a colour slide and tape lecture by P. Ginger on Barbs, which was operated by T. Danby. This proved most interesting to members, as the slides were of good quality and the information from the tape most informative. Due to the length of the tape it was unfortunate that there was not time left for discussion. The table show was for Rasboras and Cichlids and the results were as follow: Rasboras: 1, A. Barnes; 2, D. Harding; 3, A. Williamson; 4, R. Travers. Cichlids: 1, 2 and 3, J. Jefferies; 4, A. Williamson.

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THE annual members show of the **Horsforth and District A.S.** was held in March and Mr. Phillip Moorhouse judged the fish. The results were as follow: Anabantids: 1, P. J. Smith; 2, J. Dunn; 3, Miss C. Wood. Catfish: 1 and 3, P. J. Smith, 2 Miss J. Helm. Cichlids: 1, J. Dunn, 2 and 3, J. Wood. Pairs: 1, B. Runnacles; 2, J. Wood; 3, J. Dunn. A.O.V.: 1 and 3, A. Hardcastle; 2, C. Corns. Barbs: 1, J. Dunn; 2 and 3, B. Runnacles. Characins: 1, B. Runnacles; 2, Miss C. Wood; 3, Mr. C. Corns. Juniors: 1 and 2, M. Kelly; 3, Mr. D. Holdsworth. Best fish in show was J. Dunn's Marble Angel.

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THE following committee was elected at the annual general meeting of the newly formed **Petersfield and District A.S.**. Chairman, W. F. Upton; secretary, Mrs. J. M. Upton; treasurer, J. Crockford; show secretary, J. Barkham; rest of committee, J. Kingham; M. Clarke; L. Yates. The club meets at the Social Club, Petersfield on alternate Tuesdays at 8 p.m. Everyone is welcomed and further details may be obtained from the secretary: Mrs. J. M. Upton, 56 The Causeway, Petersfield, Hants. Tel. No. Petersfield 4583.

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RESULTS of the table show at the March meeting of the **Bristol A.S.** were—Goldfish: 1, S. Lloyd. Orandas: 1, S. Lloyd. Fantails: 1, S. Lloyd; 2, 3 and 4, G. Bell. Cichlids: 1 and 3, E. Bowden; 2 and 4, Miss H. Morgan. Characins: 1, W. G. Ham; 2 and 3, Miss H. Morgan. Whilst the judging of the table show was taking place the members present had a brief look at a pH meter to find out with a general questions and answers session how it worked and what is pH.

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GUEST speaker at the **Ilford and District Aquarist's and Pondkeepers' Society** was Mr. Pye. His talk was on fishes, their shape, size, camouflage and habits, and the reasons why and was accompanied by a large number of very good colour slides.

RESULTS of **Worksop Aquarist and Zoological Society** annual open show: Swordtails: 1, Mr. and Mrs. Ardron (Doncaster); 2, T. Nicholson (Sherwood); 3, Miss S. Clarke (Aireborough). Guppies: 1, Master A. Barrett (Castleford); 2, Mr. and Mrs. Marshallsea (Blackburn); 3, Mr. and Mrs. Daines (Doncaster). Mollies: 1, J. Igoe (Sherwood); 2, S. Withers (Gainsborough); 3, Mr. and Mrs. Guy (Doncaster). Platies: 1, J. Furness (Castleford); 2, D. and M. Laycock (Sheaf Valley); 3, W. Blundell (Doncaster). Small Barbs: 1, Mr. and Mrs. Tomlinson (Chesterfield); 2, Mr. and Mrs. R. T. Bull (Derby Regent); 3, J. Furness (Castleford). Large Barbs: 1, Mr. and Mrs. Cohen (Pontefract); 2, T. Smith (Sheffield); 3, Mr. and Mrs. Bailey (Sherwood). Small Characins: 1 and 2, D. and M. Laycock (Sheaf Valley); 3, Mr. and Mrs. Richardson (No Society). Large Characins: 1, Mr. and Mrs. Daines (Doncaster); 2, Mr. and Mrs. Bailey (Sherwood); 3, Mr. and Mrs. Stephenson (Sherwood). Egglaying Tooth Carps: 1, Mr. and Mrs. Blades (Creswell); 2, Mr. and Mrs. Marshallsea (Blackburn); 3, N. Carr (Doncaster). Danios: 1, T. Smith (Sheffield); 2, Mrs. Wells (Doncaster); 3, D. Carnegie (Corby). Rasboras: 1, Mr. and Mrs. Fletcher (Doncaster); 2, T. Smith (Sheffield); 3, Mr. and Mrs. R. T. Bull (Derby Regent). Sharks and Foxes: 1, W. Blundell (Doncaster); 2, D. Carnegie (Corby); 3, Messrs. McArdle and Kirk (Castleford). Minnows: 1, Mrs. Wells (Doncaster); 2, T. Smith (Sheffield); 3, K. Barrett (Doncaster). Dwarf Cichlids: 1, G. Brown (Mount Pleasant); 2, Mr. and Mrs. D. Kirk (Castleford); 3, Mr. and Mrs. Lodge (Castleford). Large Cichlids: 1, Mr. and Mrs. Sellars (Lincoln); 2, J. Igoe (Sherwood); 3, Mr. and Mrs. Borrill and Sons (Lincoln). Angels: 1, Mr. and Mrs. Sellars (Lincoln); 2, D. and P. Birdsall (Aireborough); 3, Mr. Thorpe (Doncaster). Catfish: 1, L. Smith (Castleford); 2, T. Smith (Sheffield); 3, Mr. Lancashire (Doncaster). Loach: 1, Mr. and Mrs. Marshallsea (Blackburn); 2, K. Barrett (Doncaster); 3, Mr. and Mrs. Lodge (Castleford). Fighters: 1 and 3, Mr. and Mrs. Cohen (Pontefract); 2, L. Smith (Castleford). A.O.V. Anabantids: 1, W. Blundall (Doncaster); 2, Mr. and Mrs. Simpson (Worksop); 3, Mr. and Mrs. Emerson (Castleford). A.O.V. Tropicals: 1, Mr. and Mrs. Simpson (Worksop); 2, Mr. Wileman (Unique); 3, Mr. and Mrs. Cohen (Pontefract). Marines: 1, Mrs. Wileman (Unique); 2, P. Stanniforth (Sheaf Valley). Pairs (Livebearers): 1, Mr. and Mrs. Daines (Doncaster); 2, Mr. and Mrs. Fletcher (Doncaster); 3, J. Furness (Castleford). Pairs (Egglayers): 1, Mr. and Mrs. R. T. Bull (Derby Regent); 2, T. Reid (Worksop); 3, Mr. and Mrs. Cohen (Pontefract). Breeders Egglayers (1-10): 1, P. Stanniforth (Sheaf Valley); 2, Mr. and Mrs. Cohen (Pontefract); 3, Mr. and Mrs. Ardron (Doncaster). Breeders Livebearers (1-10): 1 and 2, D. Carnegie (Corby); 3, W. Blundell (Doncaster). Breeders Egglayers (11-20): 1, Mr. and Mrs. Fletcher (Doncaster); 2, T. Reid (Worksop); 3, Mrs. Wells (Doncaster). Junior A.V. Tropicals: 1, Master K. Simpson (Worksop); 2, Master D. Dean (Middleton); 3, Miss S. Clarke (Aireborough). Goldfish: 1, Mr. and Mrs. Richardson (No Society); 2, P. Crossland (Edwinstowe); 3, Mr. Blatherwick (Long Eaton). A.O.V. Coldwater: 1, Mr. and Mrs. Blades (Creswell); 2, Mr. and Mrs. Kilvington (Doncaster); 3, E. C. Acroyd (Aireborough). Shubunkins and Fancy Goldfish: 1 and 3, Miss S. Clarke (Aireborough); 2, Master J. Emerson (Castleford). Plants: 1, Misses C. and J. Sibson (Worksop); 2 and 3, Mr. and Mrs. Kilvington (Doncaster). Furnished Mini Jar: 1, 2 and 3, R. Harlow (Derby Regent). Novelty Jar: 1, R. Holland (Chesterfield); 2, A. Mawson (Worksop); 3, Mrs. L. Mawson (Worksop). Best Fish in Show: Mr. and Mrs. K. Blades (Creswell).

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THE first meeting of the **Welwyn Garden City A.S.** in March was a great success, when the younger members of the society, especially Dave Collis, Andy Hargrove and Sue Fitts, organised and ran an open meeting for all members of the general public. It is anticipated that the meeting will eventually swell the membership of the society, but more important, it indicated to the public that a gold fish bowl is only a very poor beginning to a fine hobby.

The second meeting of the month saw the return of Messrs. Pearson, Vickers and Dodkins, who gave a comprehensive programme on, Labyrinths, Breeding Fighters and also judged the table show.

The Society meet on the first and third Monday of each month at 8.00 p.m. in "The Scout Hut", Great Dell, Welwyn Garden City. Guests and potential new members are always welcome. On 6th May, Dick Hills will be lecturing on "Angels", and on 20th May a slide talk on Catfish will be given by Derek Lambourne. If further details are neccessary phone Mike Graham, Welwyn Garden City 31823.

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IN March, **Llantwit Major A.S.** (F.B.A.S./C.N.A.A.) acted as host Society in what should have been a Three-way Interclub Contest between Llanrwit Major, Rhondda and Barry for the "Glanafon" Perpetual trophy to be competed for in future every six months. It was disappointing to all that Barry were unable to attend on what was an extremely good evenings' entertainment. A large crowd was in attendance together with a large number of fish benched. Results: Trophy winners: Rhondda A.S. by 11 points to 9. A.O.V. Egglayers: 1, H. Chick (L.M.); 2, W. Limbrick (L.M.); 3, Master J. Edwards (L.M.); 4, M. Thomas (R.); 5, J. Thomson (L.M.). A.O.V. Livebearers: 1, 3 and 4, A. Smith (R); 2, M. Thomas (R); 5, R. S. Wigg (L.M.). Best fish: H. Chick with a Red Fin Shark. The appreciation of all was extended to the two officiating judges: Mr. C. Harding (R.A.T.F.A.) and Mr. G. Best (Swansea) for their competent judging of such a large number of entries.

Whilst the judging was in progress a "Bring and Buy" took place.

Will all members please note that our May meeting place will be at Llanilltud Fawr Secondary School, 7.30 p.m.

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THE **Lincoln and District A.S.** held their annual competition for the Renshaw Trophy at the March meeting. The competition was judged by Mr. F. Toyne of the Sheaf Valley A.S. and the winners were as follow: 1, J. Goldson; 2, Master G. Borrill; 3, H. Kuhn; 4, C. Sellars. Mr. G. Rodgers gave a demonstration on glass tank making.

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MEMBERS of the **Weymouth A.S.** were given a talk on Tropical Catfish and Corydoras by the Club's President P. Carter at the March meeting. He gave a general outline on the keeping and breeding of these fish, then answered members questions.

Over forty fish were entered for the table show and the results were as follow: Tropical Catfish: 1, B. Dalley; 2, Mrs. E. Hart; 3, D. Mullen; 4, D. Rogers. Corydoras: 1 and 2, Mrs. P. Carter; 3, J. Fancy; 4, A. Billington. Sharks: 1, Mrs. Mackie; 2, Kevan Abraham; 3, Mrs. Dalley and A. Worth. Meetings are held on the second Tuesday of the month at 7.30 p.m. at the Ratcliff Hall, Queens Road, Radipole Spa, Weymouth. New members and visitors are very welcome.

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MEMBERS and guests of the **Gt. Yarmouth and District A.S.** had a most enjoyable evening at their annual Buffet Dance in March. Mr. R. Cator, a guest, gave a special vote of thanks to Mr. D. Garrod, a society member, who was directly responsible for the most excellent buffet.

Following the encouraging support for the Tropical Fish Exhibition staged last year the society has now formed a separate committee to organise a two-day exhibition this summer (see Aquarist Calendar). Committee members are as follow: A. Kirby, Co-ordinator; R. Andrews and P. Watson, publicity; D. Lacy and M. Weekly, floor managers; D. Garrod, canteen and refreshments manager; R. Stern, P. Parsley, M. Childs and A. Branham, committee members.

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THE March meeting of **Yate D.A.S.** (Severnside A.A.) was the first interclub of the year, and their opponents were Bristol Aero A.S. There was a good turn out of fish and members of both clubs, and the evening proved very enjoyable. B.A.A.S. beat Yate in the first round by 4 points and also won the quiz which was prepared for entertainment for the members while the fish were being judged. Results: Barbs: 1, R. Curry (B.A.A.S.); 2, R. Hyett (Yate); 3, D. Noble (B.A.A.S.); 4, F. Mormon (B.A.A.S.). A.O.V. Labyrinths: 1, B. Poots (Yate); 2, B. Snell (Yate); 3, B. Castillon (Yate); 4, T. Dunsford (B.A.A.S.). H. and H.: 1, G. Sprake (B.A.A.S.); 2, T. Dunsford (B.A.A.S.) 3, F. Mormon (B.A.A.S.); 4, B. Poots (Yate). First round ended with B.A.A.S. 17 points and Yate 13 points. A return interclub is to be arranged later.

The Yate D.A.S. meet at the "Half Moon" Coalpit Heath 7.30 p.m. each first Monday of every month. Prospective members and visitors are welcome.

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FINAL result of the Birmingham Section of the **Fancy Guppy Association** Points Cup Trophy 1973-74: A. C. and J. Truman (Bristol) 207 points; Don and Babs Phillimore, 204 points; G. Steadman, 167 points.

Visitors and new members who wish to learn the finer breeding details of the Fancy Guppy will be welcomed. The meetings are on the fourth Sunday afternoon of each month at the Glebe Farm Community Centre, Stechford, Birmingham. For further information please contact the secretary G. Beacham, 35 Frankton Close, Matchborough, Redditch.

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THERE was good support at the monthly meeting of the **Northwich and District A.S.** by a good turn-out of members of the newly-formed Winsford Vale Royal A.S. who were welcomed by members of the Northwich & D.A.S.

The lecture for the evening was on setting up a furnished tropical aquarium for exhibition and home display. The lecturer was Mr. L. Thorne of the N. & D.A.S., winner of the Individual Furnished Aquarium, tropical class at the British Aquarists Festival 1971, and winner of the club furnished tropical class at the B.A.F. in 1972. After the interval a slide show of furnished aquariums and stands of the Aquarists Societies seen at the B.A.F. over the last five years was presented by Mr. H. Buckley of Northwich & D.A.S. Table show results: Killifish: 1, 2 and 3, T. Sinclair. Barbs (under 3"): 1 and 3, T. Sinclair; 2, L. and D. Thorne. Barbs (over 3"): 1, B. Connelly; 2, L. and D. Thorne; 3, P. Wrench. Breeders award scheme: P. Wrench (Red Swords), 71 points; S. Royle (Guppies), 55 points. The fish were judged by Mr. J. Buckley.

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AT the monthly meeting of the **Brighton and Southern A.S.** the members saw a tape/slide lecture on general fish-keeping, which was put together by society members some years ago. This proved to be of great interest to the many new fish-keepers and reminded older members of what fish used to be like. The chairman, Mr. Rice, then did the monthly auction of plants, fish and equipment, etc.

It was announced that the family outing will be on the 14th July. The table show was judged by Mr. P. Cottee, F.B.A.S. who awarded Mr. B. Sayes his first First Card.

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THE main item of the March meeting of **S.A.P.A.** was an informative tape lecture on Siamese Fighting Fish and this was followed by a general discussion about fish and problems with keeping fish.

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THE annual general meeting of the **Midland Association of Aquarists Societies** was held in March, the main item on the agenda being the election of the following officers and committee for the year. Chairman, T. Stow

(N.W.A.S.); secretary, K. Bates (Hinckley and D.A.S.); treasurer, R. Tedds (Bedworth A.P.S.); service secretary, R. Tedds (Bedworth A.P.S.); bulletin editor, R. Marsden (S.A.S.S.); judges convenor, G. Parker (S.A.S.S.); speakers' convenor, M. Harvey (M.T.A.). The rest of the committee elected were: 1, G. Noble (Chelmsley A.S.); 2, G. Roberts (Lucas A.S.); 3, Mrs. D. Roberts (Lucas A.S.); 4, M. Carter (Bedworth A.P.S.); 5, M. Bates (Haden A.S.); 6, M. Edwards (Cannock A.S.).

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FISH disease was the subject of a talk at the **Association of Goldfish Breeders** March meeting. The table show was judged by L. Fleming, after which there was a general discussion about the fish on show. Results: Dorsaless: 1, L. Clements. A.O.V. Young Fish: 1, H. Bence; 2, L. Clements; 3, D. Nutt.

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AT the March meeting of the **British Marine Aquarists Association** (West Midland Group) the members were entertained with a slide show which had been taken of the members' tanks. Great interest was shown by all. The project seems to have started with great enthusiasm by the members and the committee hope it will be a success when it is finished at the end of the year. The projects officer, is G. Wilkes. During the evening Derek Highfield gave a talk on some slides which were hired from the B.M.A.A. on native and tropical marines.

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THE meeting of the **Cheshire and North Wales Group B.M.A.A.** opened with a discussion on Plutosus catfish—this being the fish of the month—with references from books and then from members own experiences with these fish. The main item for the evening was a talk by Mr. E. Stokes who gave his ideas on aquascaping a tank which was very enlightening and then he answered questions put to him on the subject. Meetings are held the first Monday of the month at the R.A.O.B. Social Club, City Road, Chester.

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COLD WATER fish judging was the subject of a talk given to the **Bournemouth A.S.** at the March meeting by Mr. B. Coombs (an ex chairman and standing committee member). His talk gave the club members an idea of what it is like to judge this section of the fishkeeping hobby and he said it would appear that to judge cold water fish is more difficult than tropicals because with the latter' marking is a straight set of 20 marks adding up to 100. With cold water fish the marking is broken down into five groups with 24 as the first mark and a further four groups of 19 marks which are again broken down into further groups each numerically different. This group ranges from goldfish to the ordinary river fish where there are many varieties of strange and beautiful fish.

Table Show Results: Characins: 1 and 2, Mr. Chatsfield; 3, K. S. Gibbs. A.V. Pairs (Tropical): 1 and 3, Mr. Chatsfield; 2, Mr. Haskins. Common Goldfish: 1, B. Coombs; 2 and 3, Mr. Greenhalge. Shubunkins: 1 and 2, B. Coombs.

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MEMBERS elected to serve on the committee of the **Hartlepool A.S.** at the annual general meeting were: chairman, E. Williams; vice-chairman, K. Alder; secretary, M. Sneddon, 35 Spuren Walk, Hartlepool; treasurer, N. Wainwright; show secretary, S. Hay, 43 Ventnor Avenue, Hartlepool; librarian, P. Newton. Results of annual table show championships: Egglayers: 1 and 2, R. Atherton; 3, H. Garthwaite. Livebearer: 1, 2 and 3, J. Ronel. Best exhibitor of 1973-74: Master Charles Sneddon.

THE **Peterborough Fishkeepers Association** members were entertained at the March meeting with a very good film which was shown of a Journey to the Far East by Keith Barraclough. Table show result: 1, J. Butler; 2, K. Fox; 3, R. Walden.

In April a slide show on Cichlids was shown and the novice table show class was won by B. Fairchilds, second being D. Fincham and third C. Coe.

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PROGRAMME at the **Dunmow and District A.S.** March meeting was a six way quiz and table show which was held between Dunmow, Harlow, Haverhill, Cambridge, Chelmsford and Billericay. The quiz was conducted by Mr. M. Pearson and R. Dodkins of E. London. The Dunmow Club was also pleased to welcome members from Hendon. Results of the quiz and table show are as follow: Quiz: 1, Billericay; 2, Harlow; 3, Gt. Dunmow; 4, Haverhill and Chelmsford. Table Show: 1, Chelmsford; 2, Haverhill; 3, Cambridge; 4, Harlow. Winners of the table show on points were: 1, Chelmsford, 1,112 points; 2, Cambridge, 1,108 points; 3, Haverhill, 1,103 points; 4 Dunmow, 1,045 points.

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EARLY in January the **High Wycombe A.S.** was entertained by the treasurer who spoke on his favourite subject of genetics applied to fishkeeping. Also in January the vice-chairman tested the members with an excellent if hastily compiled quiz which filled in for another cancelled event.

Mr. A. Tuffs visited High Wycombe in February to talk on the drug M.S.222 and its uses in fish anaesthetisation and killing. Although a fascinating subject, listeners were doubtful about the long-term effects, and would M.S.222 prove to be the thalidomide or penicillin of fish keeping?

A particularly crowded evening was the result of holding the three Counties Quiz League at High Wycombe, this particular leg being won by Reading.

Meetings in March were occupied in discussing club business. New members are very welcome and should contact the secretary at Penn 3825 for details.

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THE **Catfish Association of Great Britain** are holding their next meeting on 13th May at St. Saviours Church Hall, Cobbold Road, London, W.12. (A-Z ref.: Page 58 3A). Prospective members welcome. Meeting commences at 8.00 p.m. Refreshments available.

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THE **Sandgrounders A.S.** held their annual general meeting early in April and it was with regret that the meeting heard that the Chairman Mr. Harry Ormesher did not wish to stand for office for another year. The Vice-chairman, Mr. Ray Cliff, thanked Mr. Ormesher in his absence, for the work he had done for the Society in the past.

The following officers and committee were then elected by the members, to serve the Society for the ensuing year: president, M. D. Murphy (re-elected); chairman, R. Cliff, vice-chairman, T. Tasker; hon. secretary, S. Hooton (re-elected); hon. treasurer, K. Howard (re-elected); show secretary, G. Waterhouse; committee: R. Sutcliffe, M. Mollen, A. Jervis, C. Ivason, D. Blundell. Auditor: R. Clift (re-elected).

Since moving to new meeting rooms in August, the membership has expanded at each meeting until the total exceeded 70.

The Society held its third and most successful Open Show in July, when there were over 500 entries and no less than 700 visitors. After Xmas the members were invited by their President Denis Murphy to view behind the scenes at the aquarium in Liverpool Museum. More recently, the Society held an inter-society table show with the Blackburn Aquarist Waterlife Society, which ended with the following result: Sandgrounders 38 points, Blackburn 16 points.

The Sandgrounders look forward to another successful year of fishkeeping and extend a warm welcome to other aquarists to join them at the next meeting. All enquiries to the secretary, Mr. S. Hooton, 81 Radnor Drive, Southport, Lancs. Tel. 0704 24743.

SHOW CANCELLATION

Owing to unforseen circumstances **Dudley and District A.S.** show on the 23rd June has had to be cancelled.

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RETURN OF TROPHIES

The **Croydon A.S.** are not holding an Open Show in 1974. Would all winners of trophies please return them to M. Cook, 7 Knapdale Close, Eliot Bank, Forest Hill, London, S.E.23.

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CHANGES OF VENUE

Newbury and District A.S. meetings are now held on the third Tuesday of the month at the Liberal Hall, Bartholomew Street, Newbury, 7.30 p.m.

Hampstead and District A.S. Now meet second and fourth Mondays each month, at Blackfriars Hall, The Priory, Southampton Road, N.W.5. 8.00 p.m. Details, 722 5888 or 487 7463.

Huddersfield T.F.S. As from April the club will hold fortnightly meetings on every other Tuesday at The Invalid Car Club, Mill Street, Crosland Moor, Huddersfield.

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SECRETARY CHANGES

Hampstead and District A.S.: T. Woolley, 20 Coppitts Close, N. Finchley, 368 4876.

Osram A.S.: H. Penhall, 39 Grain Road, Shaw, Oldham.

Goldfish Society of Great Britain: R. Dodkins, 107 Cobham Road, Seven Kings, Ilford, Essex.

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SECRETARY CHANGE OF ADDRESS

Swansea A.S.: P. Lewis, 7 Brynasaffi Terrace, Mount Pleasant, Swansea.

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SHOW SECRETARY CHANGES

Goldfish Society of Great Britain: Mrs. M. Dudley, 163 South Park Road, London, S.W.19.

Sandgrounders A.S.: G. Waterhouse, 23 Moss Lane, Churchtown, Southport, Lancs.

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AQUARIST CALENDAR

5th May: Osram A.S. Open Show, at the Recreation Hall, Refuge Street, Shaw, Near Oldham, Lancs.

5th May: Bournemouth A.S. annual Open Show to be held at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show Secretary, J. V. Jeffery, 30 Beaumar Avenue, Southbourne, Bournemouth, BH6 4JF.

5th May: Hull A.S. Open Show. Venue to be decided. Show Secretary, G. Andrews, 4, Church Mount, Sproatley, Hull.

11th May: Port Talbot A.S. Open Show at the Y.M.C.A. Buildings, Port Talbot.

11th May: Southend, Leigh and District A.S. Open Show, to be held at St. Clements Hall, Leigh-on-Sea. Club furnished, individual furnished, aquascapes and marine classes included. Show schedules from Derek Durrant, 172 Trinity Road, Southend-on-Sea, Essex. Tel: Southend 610576.

11th May: Whiteway and District Fishkeepers' Society. Second Open Show at Whiteway Community Centre, Kelston View, Whiteway, Bath. Schedules available from Show Secretary, Mrs. E. Daniels, 21 Haycombe Drive, Whiteway, Bath BA2 1PG, Somerset.

12th May: Gloucester A.S. third Open Show will be held at The Education and Leisure Centre, Painswick Road, Gloucester. Schedules Feb. onwards from B. Walker, 41 Hailes Road, Gloucester.

12th May: Worsley and District A.S. first Open Show will be held in the British Legion Club, Wilfred Road, Walkden, nr. Manchester. Further details (S.A.E. please) to the Show Secretary, C. Carl, 16 Tennyson Road, Farnworth, Bolton, Lancs.

16th May: Diss & District Fishkeepers Club: Secretary, M. Butcher, "Rosemont", Shelfhanger Road, Diss, Norfolk.

18th May: Trowbridge and District A.S. Open Show will be held at the Nelson Haden Boys School, Frome Road, Trowbridge, Wilts. Schedules available from the Show Secretary, S. S. Huntley, 49 Marsh Road, Hilperton, Trowbridge, Wilts.

19th May: Merseyside A.S. Open Show. Venue to be announced later. Schedules from W. Smith, 63 Long Lane, Liverpool, L15 4HE.

19th May: Yeovil and District A.S. Open Show, School Hall, Martock, Somerset. Schedules from P. New, 8 Mayfield Road, Yeovil, Somerset. Yeovil 24225.

19th May: Goole and District A.S. second annual Open Show in Goole High School.

19th May: Boston A.S. Open Show at Blackfriars, Boston, Lincs. Show schedules from D. J. Carter, Secretary, 38 Tooley Lane, Wrangle, Boston, Lincs.

19th May: Redcar A.S. Second Annual Open Show, in the "Swan Hotel," Redcar. Postal entries accepted. Contact S. W. Bartle, Show Secretary, 39 Birkdale Road, New Marske, Redcar, Teesside. Tel: Redcar 77694.

19th May: Tamworth & District A.S. Open Show. Details from M. M. Clarke, 11 Kipling Rise, Coton Green Village, Tamworth, Staffs., B79 8LX. Tel.: Tamworth 67332.

19th May: British Killifish Assocn. (Collingham Group) Open Show at Collingham Memorial Hall.

25th-26th May: F.G.A. International Open Show, at Glebe Farm Community Centre, Glebe Farm Road, Stetchford, Birmingham. Full details from Show Secretary, D. R. Beacham, 17 Pedmore Close, Woodrow South, Redditch, Worcs.

26th May: Corby and District A.S. Open Show at the Corby Civic Centre. F.B.A.S. rules. Details from A. Slow, 176 King Street, Kettering, Northants.

26th May: Bridlington and District A.S. proposes to hold its First Annual Open Show at the Alexandra Hotel, Bridlington, E. Yorks. Schedules now available from J. Lee, 93 Cardigan Road, Bridlington, E. Yorks. Tel: 6759.

26th May: The Loyne Aquarist 4th Open Show. Schedules available from the Show Secretary, Mrs. H. Batchelor, 52 Lythefell Avenue, Halton-on-Lune, Lancaster. Tel.: Halton-on-Lune 625.

26th May: The Half Moon A.S. Third Annual Open Show at the Corporation Hall, Stockton, Teesside. Schedules from Show Secretary, P. McGee, 21 Allington Drive, High Grange, Billingham, Teesside, or Mrs. Willis, 100 Darlington Lane, Norton, Teesside.

26th May: Portsmouth A.S. Inter-Club Show, to be held at the Portsmouth Community Centre. Judges from the F.B.A.S. panel, information will be sent to Clubs around the south as soon as it is printed. For those who do not wish to spend a few hours on Southsea beach, etc., there will be entertainment at the hall.

26th-27th May: The Fifth Annual Fish Exhibition of the Mid-Sussex A.S., incorporating the world famous Crab Derby and many other attractions will be open to the public on Sunday, 26th May, 10.30-8 and Monday, 27th May, 9.30-5. With a wide range of side shows this will be everyone's idea of a family outing. All local roads will be signposted to make it easy to find The Park Centre, Burgess Hill, Sussex (only 12 miles from Brighton and the sea).

29th May: The Horsforth and District Inter-Club Show to be held at The New Civic Hall, Stanningley Road, Pudsey. Secretary: P. J. Smith, Leeds 675712.

1st June: Goldfish Society of Great Britain (meeting) Conway Hall, Holborn, London, W.C., 2.00 p.m.

2nd June: British Cichlid Association (Northern Area) Show for Cichlids only, at Oval Community Centre, Washington, Co. Durham. Schedules from C. A. Enright, 27 Longacre, Houghton-le-Spring, Co. Durham DH4 5PY.

2nd June: Loughborough and District A.S. Open Show. Schedules from I. Purdy, 10 Cleveland Road, Loughborough, Leics., LE11 2SP. Tel: 61715.

2nd June: Kettering A.S. Open Show. Further details and schedules available from M. Tyrrell, 19 Channing Street, Kettering, Northants.

2nd June: Accrington & District A.S. annual Open Show at Enfield Cricket Club, Dill Hall Lane, Clayton le Moors, Nr. Accrington.

2nd June: Sudbury A.S. Open Show, St. Andrews Hall, Sudbury, Wembley, Middx. Show secretary: L. Beazier, 66 Ormesby Way, Kenton, Middx. Tel. 01-204 5374.

2nd June: Chelmsley A.S. Open Show is to be held at the Town Hall, Coleshill, ring 021-742 1410 for schedules.

8th June: Havant and District A.S. fourth Open Show. The venue will be St. George's Hall, Waterlooville. Show schedules are available from V. B. Hunt, "Caeglas", 120 London Road, Widley, nr. Portsmouth, Hants. PO7 5EW.

8th June: Llantwit Major A.S. 21st Anniversary Open Show to be held at the Town Hall, Llantwit Major. Superior celebration awards for all classes. Further information and show schedules, etc., from Show Secretary, J. J. Edwards, "Glanafon", Mill Park, Llanblethian, Cowbridge, Glamorgan CF7 7BG.

9th June: Middleton and District A.S. Third Open Show at Hollin High School, Hollin Lane, Middleton. Further details (as available) from K. Smith, 49 Marlfield Street, Manchester, M9 1BA. Please note. Society members only may exhibit.

9th June: G.K.N.P.A.S. Open Show, G.K.N. Restaurant, Salisbury Street, Darlaston, Staffs. Further details from K. Hall, 38 Richard Street, Darlaston Staffs.

9th June: Brighton and Southern A.S. Open Show and Exhibition at St. Barnabas Church Halls, Sackville Road, Hove, where there will be plenty of trade stands. Show Secretary: S. G. Feek, 55 Newmarket Road, Brighton.

9th June: Ashington and Blyth Open Show. Details later. Correspondence to: Mrs. R. Moorhead, Secretary, 59 Monkseaton Terrace, Ashington, Northumberland.

9th June: Northwich and District A.S. 6th Open A.M.D.A.S. Show will be held at the Hartford Secondary Boys' School, Chester Road, Hartford. Judging to F.N.A.S. standards. Further details, Show Secretary, N. R. Thompson, 54 Grasmere Road, Prodsham, via Warrington, Lancs. WA6 7LQ. Tel: Frodsham 32745.

9th June: Bishops Cleeve A.S. Open Show, T.A. Centre, Arle Road, Cheltenham, Glos. Show schedules from Mrs. D. Rossi, 22 Selborne Road, Bishops Cleeve, Cheltenham.

16th June: Swillington A.S. Open Show at John Smeaton School, Barwick Road, Seacroft, Leeds. Details from C. Townsend, 16 Firtree Gardens, Moortown, Leeds 17.

16th June: Salisbury and District A.S. 10th Annual Open Show will be held at The City Hall, Fisherton Street, Salisbury. Further information later.

16th June: Bishop Auckland A.S. 6th Annual Open Show to be held in Y.M.C.A., Proudfoot Drive, Woodhouse Close Estate, Bishop Auckland, Co. Durham. Further details obtainable from Mr. B. Minto (show secretary), 111 Craddock Street, Spennymoor, Co. Durham.

16th June: Washington A.S. Open Show at the Washington Oval Community Centre. Details from show secretary, Mr. I. Gardner, 95 Westernmoor, Blackfell Village, Washington, Co. Durham.

17th June: The Lancaster Section of F.G.A. will be holding their annual Open Show, at St. Margarets Hall, Tag Lane, Ingol, Preston. Trophies for all classes. Schedules from D. Ormerod, 55 Barnes Avenue, Rawtenstall, Rossendale, Lancs.

22nd June: South Derbyshire and District A.S.: Fifth Annual Members' Show will be held at the Town Hall, Swadlincote. Open to the public at 2 p.m.

23rd June: Alfreton and District A.S. Annual Open Show at the Adult Education Centre, Alfreton Hall, Alfreton. Details from the Show Secretary, R. Hickling, "Parkview," 13 Coppice Drive, Eastwood, Notts., phone: Langley Mill 5104.

29th June: Nailsea and District A.S. first Open Show. Details from show secretary Mrs. P. Genge, 33 Dunster Gardens, Nailsea, Bristol.

30th June: High Wycombe A.S. Open Show, Lane End Hall, nr. High Wycombe. Details from Show Secretary, R. Leslie, 29 Meadow Walk, Tylers Green, Bucks HP10 8DG. Penn 4586.

30th June: Lincoln and District A.S. Open Show. Show Secretary S. Hill, 14 Hardey Street, Lincoln. City Sports Centre, Skellingthorpe Road, Lincoln.

6th July: Basingstoke and District A.S. Open Show, at the Carnival Hall, Basingstoke. Details and Schedules from Show Secretary, R. Rich, 93 Pinkerton Road, Basingstoke, Hants.

7th July: Billingham A.S. Annual Open Show in Billingham Community Centre. Schedules available later.

14th July: Hetton County Aquatic Section 4th Open Show, at Hetton Community Association Centre, South Market Street, Hetton-le-Hole, Co. Durham. Schedules available from Mr. R. Riley, 32 The Meadows, West Rainton, Houghton-le-Spring, Co. Durham DH4 6NP.

14th July: Grantham and District A.S. Open Show will be held at Walton Girls' Secondary School, Kitty Briggs Lane, Grantham, Lincolnshire. Schedules available mid-March from Joint Show Secretaries, Mr. and Mrs. M. Pettison, 27 Lynn Court, Grantham, Lincs.

21st July: Sandgrounders' A.S. Open Show. Meol's Cop Secondary School, Southport.

27th July: Goldfish Society of Great Britain (meeting), Conway Hall, Holborn, London, W.C., 2.00 p.m.

28th July,: Aireborough and District A.S. Open Show, Menston Community Centre, Main Street, Menston. Half-mile off A65 Leeds to Ilkley Road. Show Secretary, Mr. W. Clarke, 20 New Street, Staincross, Nr. Barnsley, S75 6EJ or phone: Pudsey 74609. (Note new date and venue from last year).

28th July: Ely and District A.S., Tropical Fish Exhibition at Bedford House, St. Marys Street, Ely. Open from 10.00 a.m. to 6.00 p.m., details from Mr. S. Porter, 54 Cambridge Road, Stretham, Ely, Cambs.

4th August: Tonbridge and District A.S. Open Show. Show Secretary: I. T. Matheson, 33 Nortona Way, Five Oak Green, Tonbridge, Kent.

10th August: Newport (Mon.) A.S. Open Show, St. John's Hall, Victoria Avenue, Maindee, Newport, Mon. Schedules from Show Secretary, W. Gibbon, 65 Dunstable Road, Newport, Mon. Tel.: 74103.

11 August: Grimsby and Cleethorpes A.S. third Annual Open Show will be held at the Memorial Hall, Cleethorpes. Schedules later.

17th August: Anson Aquatic Club Annual Open Show to be held at Kings Hall Community Association, 155 Harlesden Road, Willesden, N.W.10. Details to follow.

18th August: Stroud and District A.S. will be holding their Open Show at Stroud Subscription Rooms, as last year. Further details to be announced later.

18th August: Bedworth A. and P.S. Open Show at Nicholas Chamberlains School, Bulkington Lane, Bedworth. Schedules from Mr. J. Salisbury, 261 Gadsby Street, Nuneaton.

18th August: Huddersfield Tropical F.S. Open Show at Paddock Youth Centre, Beech Street, Huddersfield. Details from: H. Ackroyd, 51 Warrenside, Deighton, Huddersfield. 37997.

25th August: Castleford A.S. Open Show, Civic Centre, Castleford. Further details from P. Hayes. Tel: Castleford 2782. Letters to Mrs. J. E. Asquith, 32 Lower Oxford Street, Castleford.

25th-26th August: Gt. Yarmouth and District A.S. Tropical Fish Exhibition at Youth and Adult Centre, St. Nicholas Road, Great Yarmouth. Furnished Aquaria, Tropicals, Show Fish, Coldwater and Marines, Trade stands, etc. Further details from Mr. P. Watson, Petone, 31 Common Road, Hemsby, Gt. Yarmouth.

31st August: Weston-super-Mare and District T.F.C. Fifth Annual Open Show at St. John's House, Oxford Street, Weston-super-Mare. Details from Mrs. M. Tanner, Show Secretary, 6 Byron Road, Locking, Weston-super-Mare.

31st August: Plymouth A.S. Open Show, Y.M.C.A., Armada Way, Plymouth. Benching

by 12 noon. Open to public 3.30 p.m. Schedules from Mr. Leeder, 3 North Down Gardens, Keyham, Plymouth.

September: Goldfish Society of Great Britain Open Show. Date and venue to be announced later.

1st September: Wellingborough and District A.S. (F.B.A.S.) annual Open Show at the Queensway Hall, Goldsmith Road, Wellingborough, Northants. Show schedules are obtainable from P. Wallis, 12 Cheery Walk, Raunds, Northants.

1st September: Peterlee and District A.S. 13th annual Open Show. Schedules available later from A. Bebbington, 40 Marlborough Road, Hastings Hill, Sunderland.

1st September: Bethnal Green A.S. 25th Open Show at The Institute, 229 Bethnal Green Road, E.2. Schedules from Show Secretary, Sybil Hedges, "Koi Keenor," 150 Ashburton Avenue, Ilford, Essex. F.B.A.S. Championship class to be announced. New members made welcome.

1st September: Newbury and District A.S. second Open Show will be held at The Plaza, Market Place, Newbury, Berks. Details and Schedules from G. Foster, 19 Jubilee Road, Newbury, Berks.

8th September: Harlow A.S. Annual Open Show, Moot Hall, The Stow, Harlow.

8th September: Bracknell, Didcot and Reading A.S. Joint Open Show to be held at the Students' Union, Reading University. Show Secretary: J. Horsey, 4 Rickman Close, Woodley, Reading, Berks., RG5 3LL. Tel: Reading 666917.

8th September: Slough and District A.S. Invitation Show at the Rotunda Club, Slough.

13th, 14th September: The Bristol A.S. show this year will take place at Bishopston Parish Halls. Further details can be obtained from the show secretary: Mr. E. Bowden, 12 Stoneleigh Walk, Knowle, Bristol, B54 2RL.

14th September: Hounslow and District A.S. Annual Open Show to be held at Cecil Road Youth Centre, Hounslow. Secretary, H. Pratt, 23 Woodlawn Drive, Feltham, Middlesex. Tel:01-894 0923. Show venue to be confirmed.

14th September: Malvern & District A.S. first Open Show. Schedules are obtainable from show secretary, D. West, 9 Mamby Road, Great Malvern, Worcs.

15th September: Grimwood A.S. third Open Show, to be held at the Quarry Bank Community Centre, Skelmersdale, Lancs. Details later.

15th September: Nelson A.S. Annual Open Show at the Civic Centre, Stanley Street, Nelson. Details from H. Illingworth, 94 Barrowfold Road, Colne, Lancs.

21st September: Annual Open Breeders Show for the East London Aquarist and Pondkeepers' Association will be held at Ripple Road School, Ripple Road, Barking, Essex. Show schedules are obtainable from Show Secretary, Mrs. J. Arrow, 48 Church Street, Dagenham, Essex.

22nd September: Torbay A.S. proposes to hold its sixth Annual Open Show at the Torquay Town Hall; details of show schedules, etc., later.

22nd September: Hastings and St. Leonards A.S. Open Show. Show manager, M. Penfold, 44 St. Mary's Road, Hastings, Sussex.

29th September: Hucknall and Bulwell A.S. Annual Open Show. Details later.

29th September: Chesterfield and District A.S. Annual Open Show. Venue, Clay Cross Social Centre, Chesterfield Road, Clay Cross, Nr. Chesterfield, Derbyshire. Exit 29 off M1. Follow signs four miles to show. The spacious venue is situated on the A61. For further details apply to Show Secretary, Mr. P. Morton, 56 Salisbury Crescent, Newbold, Chesterfield.

29th September: Northampton and District A.S. Open Show at the Drill Hall, Clare Street, Northampton. Show schedules from Show Secretary, G. Allatt, 30 Chiltern Avenue, Northampton, when available.

5th October: Newly formed Hampstead and District A.S. first Open Show at Blackfriars Hall, The Priory, Southampton Road, N.W.5. Details from T. Woolley, 20 Coppitts Close, N. Finchley.

5th October: Cardiff A.S. Open Show at St. Margarets Church Hall.

6th October: Hinckley and District A.S. Open Show at Heathfield High School, Belle Vue Road, Earl-Shilton. More information from Secretary, K. Bates, 6 Merevale Close, Hinckley, Leics. LE10 0PZ.

20th October: Scunthorpe and District A.S. will be holding their first Open Show at St. Paul's Church Hall, Ashby High Street, Scunthorpe.

26th/27th October: The Irish Tropical Fish Society will hold their third Annual Show at the Mansion House, Dawson Street, Dublin 2. Information and Show Schedules may be obtained from J. P. Naismith, Hon. Secretary, Kilgobbin, Sandyford, Co. Dublin.

27th October: Doncaster and District A.S. Open Show at Brodsworth Miners Welfare, Welfare Road, Woodlands.

2nd November: Goldfish Society of Great Britain (meeting). Conway Hall, Holborn, London, W.C.2. 2 p.m.

10th November: Blackburn Aquarist Waterlife Society Open Show. Venue will be the "Windsor Hall," Blackburn. Details may be had from Show Secretary: B. Marshallsea, 10 Hawthorn Crescent, Oldham, Lancs.

10th November: Halifax A.S. Open Show at the Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Individual Furnished Aquaria, Plant and Marina classes included. Schedules from David Shields, "Cobblestones," Gainsit, King Cross, Halifax. Phone Halifax 60116.

10th November: Walthamstow and District A.S. Open Show.

10th November: Hartlepool A.S. 16th Annual Open Show. Longscar Hall, Seaton Carew. Schedules available later from M. Sneddon, 35 Spurn Walk, Hartlepool or S. Hay, 43 Ventnor Avenue, Hartlepool.

17th November: Bradford and District A.S. 27th Annual Open Show at East Bowling Unity Club, Leicester Street, Wakefield Road, Bradford.

1st December: Horsforth A.S. 5th Open Show at the new Civic Hall, Stanningley Road, Pudsey.