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Comments and Quotes

Growth inhibitors in aquatic animals ●

Too much fishing ● Barrier Reef in

danger ● PetFish progress report

Big 'uns and Little 'uns

PUT one large tadpole in a 25-gallons tank with six smaller ones and the small ones remain small. Change up to a third of the water each day and the situation for the tiny tadpoles gets no better. These are some observations made in America on growth in aquatic animals, and they are explained by the assumption that larger animals of a species can produce and release into the water substances which are growth inhibitors for smaller members of the same species. This assumption has been given support by the further observation that small tadpoles placed in water previously inhabited by large specimens also have their growth stopped.

Findings of this kind are known to be applicable to young fishes growing up together in closely confined surroundings. Growth rates are unequal, and as some begin to outstrip the others in size they also begin to take the major part of the food provided, so that lack of nourishment can then operate in keeping the rest small and possibly cause deaths. But inhibitor substances like the tadpole ones are also found with fishes, and frequent generous changes of water in tanks of young fish and the even grading of the youngsters by constant removal of the bigger ones to a separate tank are the practical ways to overcome the feeding problem as well as offset the bad effects of the inhibitors.

Aquarium beginners often become saddened by seeing this phenomenon take place in their tank containing its inevitable livebearer population. The early thrill of knowing that fish are actually breeding in the aquarium causes the beginner to guard jealously every new guppy that appears. Perhaps the parents were fine large specimens, and the thought that very quickly many, many more such beauties can be 'home-grown' spurs the tyro on. What is obtained instead is a multitude of disappointingly undersized uninspiring fish, and even with the best possible feeding conditions do not improve.

Under natural conditions the undersized and weakly fish would soon fall prey to predators, and it has been suggested that the inhibitor mechanism is one of Nature's tricks aimed at controlling the size of a population in a given area.

Saving a Coral Reef

A CHANCE discovery in the aquarium at Taronga Park Zoo at Sydney may help to save the coral of the Barrier Reef, which is being killed by a giant starfish.

The curator of the aquarium, Mr Douglas Boness, noticed that a large species of shellfish, known as the triton, eats the offending starfish. Now he is urging the government to take steps to protect the triton for this fish is much prized by tourists for its beautiful brown and cream shell, often more than a foot long.

The starfish, which have laid bare many acres of coral along the Barrier Reef, are about a foot across and known as the 'crown of thorns', because of many large spikes.

So extensive is the damage at Arlington Reef, outside the North Queensland town of Cairns, that the Queensland Government has made a grant of £8,000 for research leading to its doom.

Queensland tourist organisations and resorts whose livelihood depends on the Barrier Reef have been paying bounties to skin divers to kill the starfish in the hope of saving the coral. For them, the death of the multi-coloured coral would mean the end of a prosperous tourist industry.

Thousands of tourists, many from abroad, visit the Barrier Reef each year, and such is the growing demand for accommodation that motels and hotels have been built on most of the reef's coral islands.

One of the marvels of the world, the reef stretches for 1,000 miles from the tip of Cape York, the mainland's northernmost point, to near Rockhampton, 350 miles north of Brisbane.

'Crown of thorns' starfish have multiplied rapidly since the salinity and temperature of the sea increased after drought. Experts believe that the unusual weather may have encouraged breeding, and that heavy rains possibly tend to reduce the numbers of starfish. Changes in ocean currents may also have an effect on their reproduction rate. (*Bradford Telegraph and Argus*)

Catchers cannot Sell

SO great have become the numbers of people now catching fishes by underwater swimming around the French coasts that in some areas certain species of fishes are in danger of being exterminated. To limit the extent of such fishing the French National Assembly has passed a Bill making it illegal to hawk, put on sale, sell or buy fish and other sea creatures (sponges and pieces of coral are excluded) caught by

underwater fishers. One estimate of the number of holiday-makers and others who go in for such fishing puts the figure at over 30,000.

Progress Report

THIS is the fourth issue of PETFISH MONTHLY and we are now able to report a most satisfactory response to our appearance on the aquarium scene. Comments from our growing readership have been highly favourable and all suggestions and requests are being taken to heart editorially for action. We know that some readers are still finding it difficult to obtain a copy regularly, but suppliers who are given a definite order should be able to meet the demand without trouble. Limited numbers of preceding issues are still available and can be obtained direct from our publishing office. Postal delivery each month can, of course, be secured by taking advantage of the six-monthly or twelve-monthly subscription rates.



Confusing Nomenclature

IN the Editor's comments regarding 'Tracing the Culprit' in Comments and Quotes (PETFISH MONTHLY, April) you make reference to the disease *Ichthyosporidium*. Since you refer to it as a microscopic fungus I assume you are using the American nomenclature for the disease, which is described under the European nomenclature as *Ichthyophonus*. The snag is that *Ichthyosporidium* (American nomenclature again) is also the name for a sporozoan disease (kudo). A further snag is that the London Zoological Society, a few years ago, named a totally different sporozoan infection, *Ichthyosporidium*, detailing it as the cause of neon disease. It is not beyond the bounds of possibility that a neon tetra may well carry these three diseases at the same time. Whilst my own diagnosis of such infections would be *Ichthyophonus*, *Ichthyosporidium* and *Platyphora* (neon disease) it would appear that some of my contemporaries would diagnose *Ichthyosporidium*, *Ichthyosporidium* and *Ichthyosporidium*.

This seems to be much more like the name of a firm

of solicitors rather than a graphic description of three totally different fish diseases. Is it not time this ridiculous situation was cleared up?

Kings Heath, Birmingham 14

W. HAROLD COTTON

Aeration

HAVING only commenced keeping tropical fish 2 years ago, I consider myself still a novice. One thing which continues to puzzle me is the question of filters and aerators—essential, desirable, superfluous, result of commercial pressure? Your choice of an aquarium aerator as a prize for the month's worthy letter prompts me to take up my pen in an attempt to spark off a debate which may ultimately help resolve my doubts about the pros and cons of this type of equipment. I have glanced through my five paper-backed books and hope that the authors will not take exception to my extracting the following comments.

'Aeration doubles the fish capacity of the tank . . . This loose statement is so misleading as to be worthless'. 'One of the dangers (of aeration) is that fish accustomed to aeration will suffer if moved to non-aerated water'. ' . . . Where such tanks are used it follows that a customer who does not have an air pump, and there is little reason why he should, runs a grave risk in the initial falling off in health of fish bought from aerated tanks'. (*The Right Way to Keep Pet Fish* by Reginald Dutta).

'Small water pumps for use with aquaria are of interest to the fishkeeper who wishes to have water

Prize
Letter

circulating through his tanks. Neither these nor aerators (air pumps) are essential for successful aquarium-keeping'. (*Aquariums* by Anthony Evans).

It must be explained that if an aquarium is properly set up with plenty of plants and not overcrowded with fish, no filters are necessary. Fish exist in the wild in ponds and river tributaries. These are not equipped with aerators or filters . . . really one should be able to keep an aquarium clear and healthy without such artificial aids'. (*Tropical Fish* by Derek McInerney).

. . . If artificial aeration is used to enable the aquarist to keep more fish in a tank of given size than it should contain, then artificial aeration is bad'. (*Tropical Fish and Aquaria* by P. M. Soderberg).

I accept in advance criticism that some of the extracts I have selected have to some extent been taken out of context and may be regarded as 'loaded'. I crave the indulgence of readers by reiterating that my intention was to stimulate discussion in the hope of creating interest and enlightenment.

Warrington, Lancs.

R. TENCH

We apologise to reader R. Tench for adding to his dilemma by presenting him with this month's aerator prize for his letter, but perhaps a few controlled experiments with it will prompt him to write about his own conclusions in due course.—EDITOR.

Co-ordination Between Federations

IT was with surprise that we read Mr G. Jennings' letter in the May issue of *PETFISH MONTHLY*, and feel that since he was elected to the Council, he should have had his facts right and know that the co-ordination between the Federation of British Aquatic Societies and all other organisations is now as good as it has ever been, and that there is a constant exchange of information between them.

The Federation of Northern Aquarium Societies, the Scottish Federation of Aquatic Societies, the Midland Association of Aquarists Societies and the F.B.A.S. do exchange all their information, and also recognize each other's judges. The Irish Federation, the Association of Yorkshire Aquatic Societies, and most Societies in the Federation of South Wales Aquarists' Societies are affiliated to the F.B.A.S. and so receive all material.

The Federation of Guppy Breeders Societies and sections of the Fancy Guppy Association are affiliated to us, and as specialist Societies we recognise their judges in this field.

The Association of South London Aquarists Societies and the F.B.A.S. have already agreed to the exchange of all material, and one of their Council members is also on our Council.

The F.B.A.S. Show Standards and Guides are used by other organisations and their judges, and there is also a sale for these outside the British Isles.

There has been no official contact with the Goldfish Society of Great Britain, but their show secretary is a Council member. The same also applies to the British Aquatic Study Society, the British Killifish Association,

and the Marine Study Association; all have members on our Council.

Rather than a lack of co-ordination there is plenty, and we are always prepared to meet any organisation to make more.

A. G. JESSOP,
Chairman,

Federation of British Aquatic Societies

Anything New about White Spot?

IN the April issue I was particularly interested in one of your correspondent's experience with white spot. It appears that he had been given some fish by a friend, taken from an unaffected tank, and a few days after putting them into his own tank they became infected with white spot. Yet when he revisited his friend, the tank from which the fish were taken was still unaffected.

This is by no means a unique experience and seems to suggest that we must think again about white spot. Over the past few months we have carried out many tests in connection with white spot and have arrived at the following conclusions (perhaps by no means conclusive). Firstly it seems quite clear that there is insufficient evidence to prove conclusively that the remedies we employ to treat the disease are actually responsible for clearing the fish of white spot. This applies also to the methylene blue treatment. Many times fish have been given the methylene blue treatment by us, only to find that it has reappeared when they have been introduced to a strange tank. I would add, however, that this has only happened in some species. Secondly, there is no justification for suggesting that a tank left uninhabited for any length of time will be free from white spot. Rather it seems much more likely that the parasite can remain dormant, and is present in all water.

Next to the question of the treatment of a whole tank in which white spot appears. It seems quite certain from our experience that an affected fish may be removed from the tank and treated separately, if so desired. In fact, in persistent cases, this seems to be the wisest course to adopt. It has also been our experience that some species, chequer barbs, nigger barbs, clown loaches and flame fish to mention a few, are particularly slow to accustom themselves to strange surroundings and that during this period of acclimatisation they are a vulnerable target for the white spot parasite.

To our experimental tank which houses perfectly healthy fish, we have introduced from time to time new fish with the following results. In many instances the new fish have developed white spot within 4 days. The only treatment (if such it may be called) which the tank received was an increase in temperature to 85°F (29°C). In 95% of the cases the new fish were cleared of white spot and the established fish remained unaffected. The remaining 5% were classed as persistent cases, i.e. fish which remained affected for more than 10 days after the temperature was raised. These were removed to individual tanks with the same 'treatment'—50% were lost and 50% recovered.

I must apologise for the length of this letter, but it is by no means the limit of our experiences and observations.

Beam Hatchery, Nr Darford, Kent MRS. K. COOPER

Petfish Photo Competition: photo selection unavoidably held over until next month. Entry form on page 128.



Those Marine Classes

WHILE congratulating Mr Parry and the Newport A.S. on their being the first Society in South Wales to introduce to their Show a class for native and tropical marine fishes (LETTERS, PETFISH MONTHLY, May) —and also bearing in mind the record of Portsmouth A.S. whose Show I had the pleasure of visiting last year—I would like to point out that the Scottish Aquarium Society has for some years had a class for native marines, and more recently for their tropical

cousins. The class for native fish certainly extends back to 1960 (this is as far back as my personal records go) and probably much earlier. However, on looking through the Catalogue to our 1951 Exhibition, I found the following entry: Marine Exhibit—The Marine Aquaria shown here has been provided and staged by the North of Scotland Aquarium Society, Aberdeen, with the co-operation of the Torry Research Station, Aberdeen.

Recently, the native variety has been fairly well represented at our Shows, but, although one dealer regularly exhibits tropical marines on a special display stand, only once has a tropical marine tank been exhibited as a competitive entry. Although this tank attracted a great deal of interest, especially among the members of the public, it would appear that the owners of tropical marine fish are not prepared to take the not inconsiderable risks of transporting them to and from Shows—quite understandable when one considers the prices such specimens command! At the last two Annual Shows we have also had on display an octopus supplied by the Marine Biological Station, Millport, as an exhibit of general interest.

We of the Scottish believe our Society to be the oldest in Great Britain—it was founded in 1927—and this year's Open Show (20th–22nd October) will be the latest in a sequence unbroken (except for the war years) since 1928. It would be interesting to know if any other Society in Britain can better this record.

R. J. REID

Scottish Aquarium Society



Tinfoil Barbs

We have three large tinfoil barbs, one 6 in., one 7½ in. and the other 8½ in. in length. We should greatly appreciate some information on this species (in particular the length we can expect them to reach) as we are unable to find any reference to them in the fairly large collection of books we have on tropical fish-keeping.

Tinfoil barbs (*Barbus schwanefeldi*) are magnificent fish but should be kept in a large aquarium with as much swimming space as possible and with fish of their own size. They can grow to just over 12 in. in length (at maximum growth) and are omnivorous feeders (which includes other small fishes such as cardinals and neons and frequently

the choicer plants). They are referred to briefly in, e.g. *Freshwater Fishes of the World* by Günther Stebbins and in *All About Tropical Fish* by D. McInerney, who first introduced them into this country in 1955.

Growth of Amazon Swords

I wonder if you could give me any information about my narrow-leaved Amazon sword plants. All the leaves become transparent and die off. I have broad-leaved Amazons in the same tanks but they do well. When the plants are bought they are about 15 in. high but gradually die down to about 3 or 4 in. and stay at that height or even die completely.

Since most of the varieties of *Echinodorus* require similar condi-

tions the answer may well be that the tank simply does not contain enough nutriment for the plants contained in it. The permanent inmates—the broad-leaved Amazons—are growing vigorously. The new narrow-leaved plants going into the tank are large (15 in.) newcomers that have to 'battle' with the others for food. Furthermore, tank water itself can reach a stage at which old water is so full of dissolved waste matter from the fish that it 'burns' the plants away. Half the water in the tank should therefore be changed, in two or three stages, a proprietary plant food added and rather smaller plants bought. These could be inserted in a flower pot containing coarse sand, loam and peat underneath a surface layer of gravel to give the new plants a good start.

Large Concrete Tank

As a keen aquarist I am always striving to better my hobby and I now require a 12 ft. by 3 ft. by 2 ft.

Continued on page 115



Gymnochanda filamentosa Fraser-Brunner

Who's Who Among the Glass Bass

By A. FRASER-BRUNNER

ALTHOUGH less easy to keep, less easy to breed and therefore less common on the market than some other groups of fishes, the glass bass or glassfishes have long been popular among aquarists. This is because, despite a lack of bright colours, their shape, delicate structure and transparency give them an appearance of distinction. They have been described as 'classy' fish, meaning, I take it, that they are for the discriminating and dedicated fish-keeper.

In early text-books the name *Ambassis lala* was used for the glass bass commonly kept and bred at that time. The name is still sometimes to be found in dealers' lists, but it is not correct. Firstly, the genus is properly called *Chanda*, and secondly the name *lala* is now considered to be a synonym of *ranga*. So the correct name of this fish is *Chanda ranga* Hamilton 1822.

To make matters difficult, however, I think it is very likely that most specimens brought in as *Chanda ranga* belong to another species, *C. alta*, which has been much confused with it in the past, and a third species, *C. notata*. For instance, in the text-book by Arnold and Ahl (1936), we find both '*Ambassis lala*' and '*Ambassis ranga*'. The difference between them, as far as can be judged from comparison of a photograph with a poor drawing, is that between *C. alta* and *C. notata*.

Again, if we compare Fig. 821 of '*Chanda ranga*' in Sterba's *Freshwater Fishes of the World* with the well-known coloured plate of '*Ambassis lala*' in Innes' *Exotic Aquarium Fishes*, exactly the same difference is apparent.

Arnold and Ahl's '*Ambassis lala*' and Sterba's '*Chanda ranga*' both have the high first dorsal fin without any black on the tip, which one finds in *Chanda alta* (*alta* means high, by the way). Arnold and Ahl's '*Ambassis ranga*' and Innes' '*Ambassis lala*', on the other hand, have the lower first dorsal with black tip characteristic of *Chanda notata*.

So it looks as though there was not a *C. ranga* among them!

Indeed, from the study of this group that I made some years ago, it would appear that the true *Chanda ranga*

is found only in the freshwaters of India, and in view of the small number of fishes that reach us from that country compared with those from further east, one would expect the more widely distributed *C. alta* and *C. notata* to appear more frequently. Even in India, *C. alta* appears to be quite as common as *C. ranga*.

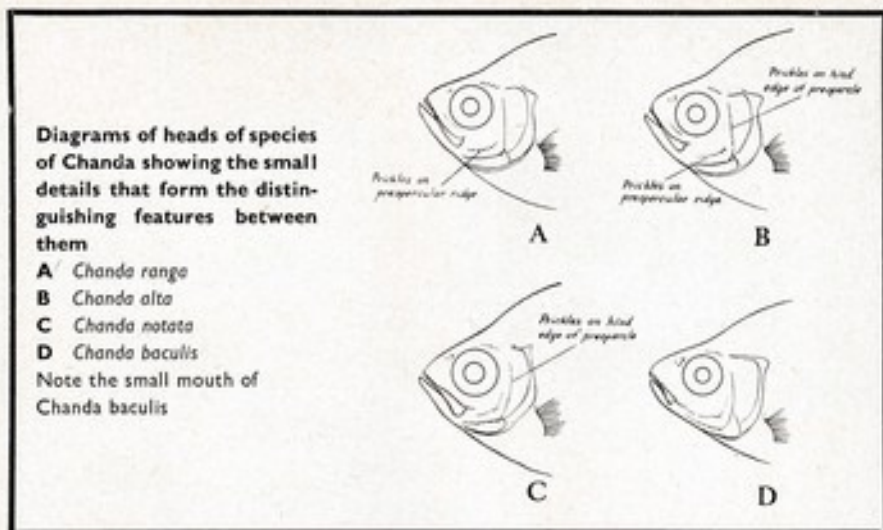
These three species differ from one another mainly in the size and number of the scales and in the arrangement of small prickles along the bones of the gill-covers. These are features that are difficult to see in a fish living in an aquarium at the best of times, but in transparent creatures like these it is impossible to be sure of identification without killing the fish and examining it under magnification. This is something which the aquarium-keeper is rather naturally unwilling to do, so in most cases he cannot be sure of the name of his glass bass.

Generally speaking, one can be reasonably sure that if the first dorsal fin is tall and without black, the fish is *Chanda alta*. If the first dorsal fin is less elevated and has black at the tip it may be either *C. ranga* or *C. notata*; the only real difference between the two is that in *C. ranga* there are prickles along the ridge of the preopercular bone but not along its edge, whereas in *C. notata* the reverse is the case. *C. ranga* is found in India but not eastward, while *C. notata* is found in Burma, Thailand and Malaya but not India.

Nor is this all. Among imports from Thailand and Cambodia are to be found specimens of yet another glass bass with a black edge to its first dorsal. It is not quite so deep in the body as those just mentioned, it has a smaller mouth and it has no prickles at all on its preopercular bone (except two small spines at the angle, present in nearly all the species). This one is *Chanda bacula*.

I received specimens from Cambodia while in Singapore and induced them to breed in brackish water. The eggs were laid on a flat stone in a corner of the tank and were guarded by the male somewhat after the manner of a cichlid. The female was removed, as she would either eat the eggs or be beaten up by the male in attempting to do so.

It is evident that, although the chandids often swim in great shoals, they must separate and acquire small



territories at breeding times. This no doubt explains the aggressiveness between males, sometimes remarked upon in text-books.

There are over 30 species of *Chanda*, only five of which have so far been reported in aquarium literature. I have just added three others above, and as we have seen they were not recognised because they are so difficult to distinguish.

The species fall into two groups, roughly half and half. One group is found mainly in the sea, entering estuaries but not usually ascending rivers. These have the scales on the cheek, below the eye, arranged in only one or two horizontal rows, and have small teeth on the tongue.

The other group is found in freshwater, descending to estuaries but not usually entering the sea. These have the cheek-scales arranged in four or more horizontal rows and have no teeth on the tongue. Most members of this group are deeper in the body, though this is not consistent and not important except that perhaps a deeper cheek is associated with the extra rows of scales.

It would be nice to think of these two groups as different genera, and I did in fact recognise them as subgenera in my technical review of these fishes about 20 years ago. But my work had scarcely appeared in print when there arrived at the British Museum a specimen from East Africa. This had been taken far up a river in undoubted freshwater, but it had all the features of a common species of the marine group except that it had three rows of scales on its cheek—that is, in this respect it was intermediate. What happens? Does a marine '*Ambassis*' moving up into freshwater acquire the features of a '*Chanda*'? Are more cheek-scales for some reason an advantage in freshwater? One has to admit that now and then an odd specimen of the freshwater group may have only three rows of cheek-scales, sometimes only one side.

Obviously we have here a single group and the name *Chanda* must cover all of them.

There are some other genera, comprising only one or two species each, mostly in Australia and New Guinea, which illustrate the evolution of the chandids, but we need not be concerned with these. It is, however, worth mentioning *Hamiltonia nama* since this one (called *Ambassis* or *Chanda nama*) has appeared in the text-books. This is very much like a *Chanda* but it is longer in the body and has a projecting, pike-like lower jaw at the end of which is a cluster of massive teeth, the points of the longest being turned outwards so that they do not pierce the upper lip. As might be expected, it is voracious and aggressive and its territorial claims unquestionable. It has very small scales, each having a little black spot at the centre. All in all, it is so different from the other species of *Chanda* that it warrants separation as a genus by itself.

Another very distinct species that has a separate genus is the one I described in 1954 as *Gymnochanda filamentosa*. The generic name simply means 'naked *Chanda*', drawing attention to the curious fact that it has no scales. The name *filamentosa* refers to the extraordinary elongation of some of the rays of the soft dorsal and anal fins, giving it an appearance quite unlike that of any other of the group.

There seems to be a fixed idea among aquarists that the females of this species are without filaments. I cannot prove that they are wrong without further investigation, but I think it very unlikely. There is no marked sexual dimorphism elsewhere in the family. My reasons for doubting the idea are as follows.

When the original specimens were sent to me there were nine 'males' and half a dozen 'females'. Owing to the small size and the method of preservation I could not

verify the sex, but it was easy to see that the 'females' were specimens of *Chanda notata*.

At a later date, when in Singapore, I contacted dealers who were selling 'pairs' of *Gymnocharacin* and again found that the 'females' belonged to *Chanda notata*. I never found anyone in the area who had successfully bred them, of course. It seems evident that these two generically distinct species are caught together in their natural habitat and assumed to be the same species.

In the colour plate of imported specimens given by Sterba (Fig. 787) the 'female' clearly has scales, putting it out of *Gymnocharacin* straight away. (This plate appears to be a heavily retouched photograph. The fins are quite incorrectly represented in the upper fish.) The author says, not surprisingly: 'I have not been able to induce my

fishes to spawn, despite many changes in the water conditions'. Yet he also states 'breeding has been managed successfully, but unfortunately the normally produced fin-rays are much shorter in captive-bred fishes', suggesting the possibility of a rather startling hybrid. I find the hybrid idea difficult to accept and suggest that the explanation might simply be that two genuine *Gymnocharacin* have mated and produced young which have never shown their full filamentation because the *Chanda* were there to keep the filaments nibbled down. It is likely that the filaments, as in many other fishes, are there to be bitten by enemies—it is better to lose a filament than to lose your tail or worse. With no information about details of the breeding, this is the best guess I can make. It may well prove to be wrong.

Lilies Around the Pool

By Dr W. E. SHEWELL-COOPER, M.B.E.

IT is surprising how little people know about lilies. Some have grown Madonnas, a few have heard about tiger lilies, but when you think that there are about 400 species, it makes you wonder why gardeners don't grow them more. The name lily comes from the Celtic word *Li*, meaning whiteness. Some lilies are delicate, but many are hardy, healthy and robust, and do well in any ordinary garden. A beginner should always start with the easiest to grow, and as he gradually increases his knowledge, he can be more venturesome.

Lilies grow under a remarkably wide range of conditions of soil. Taking it all round the majority of them, however, insist on good drainage. I have seen some most wonderful effects when lilies have been planted close to the edge of a pool and their glory has been mirrored in the water below. Remember that all lilies like shelter, and many of them don't mind partial shade. See that they have all the moisture they need when they are in active growth and they will flower well.

The simplest way of tackling the job of soil preparation is to dig out holes a foot wide to a depth of about 18 inches, and then put in at the bottom a 3 inch layer of brickbats or clinkers for drainage. Then, if you want to be very particular, you can make up a mixture of one part of soil, one part of sedge peat and one part of pure sand, and put this into the hole, firming it well. I always add, in addition, a fish fertiliser with a 5% potash content at 4 ounces to the square yard. Don't be discouraged by these special

instructions. Lilies will grow even if you don't take this trouble. But if you can be careful, then you will find that the lilies will last for a very large number of years, and will give a magnificent display each season.

I am sometimes asked about the best time for planting the bulbs, and the answer is that it very much depends when the lily bulbs are imported. Probably the ideal time to plant would be immediately after the flowers have faded. You can plant at this time of the year or as late as in March for the more tender bulbs. I have had excellent results from plantings carried out in November. As to depth, this of course varies with the size of the bulb, but a good general guide is to see that the planting is carried out so that the bulbs are about three times as deep in the ground as their greatest diameter.

Even if you cannot carry out the special preparations advised, it is possible to take the trouble to place a little sand just below the bulb at planting time, so as to make sure of draining away any surplus moisture, and thus prevent the bases of the bulbs from rotting. It does help to mulch the ground with sedge peat after planting; I usually put on a top dressing three inches thick, and then this helps to smother the weeds. Very occasionally it is necessary to pull up an annual weed by hand, but by and large these mulchings save time and labour. In very light, sandy soils, it may be necessary to give

extra feeds, and in that case, Liquimure can be used when the plants are about half grown. It is easy to dissolve this in water and to give about half a pint of feed per plant. Some people repeat the dose 10 days later.

It's possible to divide varieties into three big groups. One, the early flowering, in which you find the nankeen lily, the martagon lily, as well as *Lilium tenuifolium* and *L. haussoni*. Then there are the mid-season flowers, of which *L. regale* is one of the best known. *L. sulphureum* is another in this group, as is the leopard lily and the scarlet turk's cap lily. In the late flowerers, the number one of the group is undoubtedly the tiger lily. This is followed by *L. Henryi*, which often bears stems 7 or 8 feet long, and thus the bulbs have to be planted about 10 inches deep. The third good species in this group is *L. auratum*, which bears artistically shaped stems with a lovely gold band running through its petals.

You can go on dividing and subdividing lilies to your heart's content. There are the true lilies, for instance, sometimes called the trumpet-shaped lilies, like the madonna. There are the bell-flowered lilies, such as *L. canadense*; the heart-shaped lilies, like *L. himalayana*, which often grows 12 feet high. There are the open-flowered lilies like *L. ozotam*, and the turk's cap lilies like *L. haussoni*, also the erect-flowered lilies like *L. philadelphicum*.

New Equipment

Instant Tank Tops

QUITE a neat idea in the line of 'instant' aquarium covers is the new **AquatopFlatpak**. These flat glossy white plastic sheets are obtainable in a range of sizes to fit aquaria from 12 in. by 8 in. to 36 in. by 12 in. and are so shaped that when the long edges are slipped inside the aquarium frame the sheet is bent into a semi-circular curved form that provides a cover and lamp housing. It keeps firmly in place by its own springiness. Holes are provided for lampholders (small lamps up to a maximum rating of 40 watts are recommended) and slots along the back are present to take air lines, electrical leads etc. Foam plastic half-moon 'fillers' for the two ends of the cover are available, these being pressed into place and held there by their friction fitting. As the covers can be cut with sharp scissors the standard sizes are readily adapted to aquaria of special sizes. Price for a 24 in. by 12 in. AquatopFlatpak is 118 9d, and pieces 45 9d extra (distributors N. Sale and Co. Ltd., 42 Ramridge Road, Luton, Beds.).

Underwater Lighting

IF you like the idea of floodlighting or spotlighting your garden pool at night, or even providing it with underwater illumination, you will be interested in the **Lotus Garden Illumination System**. Each unit consists of a lampholder, lamp support, base plate, ground spike and 33 ft. of cable with connector for joining to other units if required. The special screw-thread lamps (green, blue, yellow or red floods, 100 watts, or clear spot or clear flood, 100 or 150 watts) fit into the moulded rubber lampholder with a waterproof seal and can therefore be used completely submerged in water. Basic unit cost is £9 12s 6d (lamps extra).

Wooden Diffuser Blocks

NEW from Germany are diffuser blocks made of lime wood, the fine grain releasing a mist of tiny air

bubbles from the aerator supply line. Specially recommended for use in sea water, these blocks are available in two lengths (approx. 1½ in. and 3½ in. long by ½ in. square) and are being offered by Shirley Aquatics Ltd. of Solihull at 3s 6d and 5s 6d each.

pH Testing by Hykro

FOR testing water reaction by indicator paper a new addition to the **Hykro** range of products provides a continuous roll of the paper in a

neat plastic dispenser which bears the colour code showing the hues obtained at different pH values between 6 and 8. Another new product from the same source is a plastic brine shrimp hatcher that permits ready separation of the newly hatched shrimps from their egg cases so that the latter do not become a source of pollution to fry tanks when the brine shrimps are added.

Additions to Hykro's nylon T-pieces and four-way pieces in the shape of two-way valves, three-way valves and four-ganged valves for air-lines means that with this range all possible requirements for distribution of air to a number of tanks can neatly and economically be coped with.

PETFISH Test Report

Automatic Fish Feeder

IF you are the type who likes to have everything fully automated and have not yet got around to having clock-work fish, you will be delighted to meet '**Lazy Susan**'. Lazy Susan is also your girl if you have a batch of fish you want feeding at regular intervals whilst you are away from home. This automatic fish feeder from the U.S.A. is being distributed here by Inter-Pet. Its overall dimensions are 4 inches diameter by 3 inches deep and the fittings enable it to be clamped firmly to the top bar of the aquarium.

A tiny and noiseless electric motor drives a spindle carrying an actuator which at pre-determined intervals moves a circular arrangement of 15 plastic compartments for food in such a way that at each movement the contents of one compartment are emptied into the tank. Each compartment holds up to about half-a-teaspoonful of food. One revolution of the spindle is made every 24 hours, and the actuator can be altered to give feedings one, two, three or four times a day. With it adjusted to give one feed a day and the compartments all loaded with food it is thus possible to give a daily feed for 15 consecutive days.



By a slight adjustment it is possible to have continuous feeding in constant small amounts throughout the day, with daily re-charging of all the compartments, which might find application for a tank with large numbers of growing youngsters in it. Grain foods have been found to be dealt with more satisfactorily than flake foods by the Lazy Susan. Adjustments of the feeding rate and removal of the ring of plastic compartments and its cover for cleaning purposes are simply and quickly done. The whole unit is of solid and robust construction and is supplied with 4 ft. of flex attached.

'Lazy Susan' supplied by Inter-Pet, Dorking, Surrey. Retail price £6 15s.

AQUARIUM AMERICA THROUGH THE LOOKING GLASS—4

By JIM KELLY

The author examines some large terrapins handed to him by Mr. Dan Watson (right), Director of the Indianapolis Zoo



A Look Back in Admiration

THE year 1965 will be remembered for many reasons: it was the 750th anniversary of the signing of the Magna Carta, the 150th anniversary of our victory at Waterloo and the 25th celebration of the Battle of Britain, to mention a few. To me it will long be remembered for my trip to the United States and the opportunity to see the American tropical fish hobby at first-hand.

If I asked you to glance up from the printed page for a moment and give your ideas on what the hobby is like Stateside, I wonder what answer you would give me?

If your impressions were gleaned from reading American aquatic magazines you could be forgiven if you were a little envious of their equipment, of pumps that make what to do with the surplus air a problem, or, if you are a specialist breeder, of the ease with which they obtain first-class stock on the other side of the Atlantic.

As my two-weeks-stretched-into-two-months' trip rapidly came to a close, I took stock and gave some thought to what I had learned during my travels. Taking into consideration the differences of outlook, environment and spending power, what could the American fish-keepers teach us in our tight little island?

Fish Societies in the U.S.A.

First, their fish societies. They, too, have their clubs catering for the general hobbyist, and groups like the American Guppy Association, Guppy Associates,

American Killifish Association and Coldwater Society, all looking after the specialist aquarists' needs. I was going to give emphasis to their flourishing Marine Group, but our newly formed British Marine Study Society seems to have taken care of that discrepancy in our list.

Their society officers, like comets, come and go just as ours do, and they know what it is like to have the same old 'few' shouldering most of the work. Yet despite these similarities they are different!

American history fostered a system of independence and interdependence that led to private enterprise being highly prized; may be some of this competitive spirit has rubbed off on to the aquarists that throng the show benches and fish shin-digs of the New World. Was this the difference?

To cite one example: the Aquarium Hobby Club of Indianapolis netted 1,000 dollars gross on only their second fish show, and this with only 35 members on their books. How did they do it and how do other clubs continually emulate this feat?

To advertise one show I had appeared on both T.V. and radio, all arranged by the sponsors. Everywhere I turned posters announced the forthcoming attraction; as I have written before, the U.S. hobbyists don't believe in hiding their talents under a bushel—they even floodlight the bushel!

They have the habit of tagging these get-togethers 'International' when they are no more so than the Donkey Derby is a 'Classic', but then a look at the



A Siamese fighting fish in double flat-sided glass 'drum-bowl' used in U.S.A. shows

tongue-twisting names under the list of exhibitors makes one re-think that thought.

Travelling miles just to talk and swap fish yarns, the American fish-keeper jumps about like a hare at a courting match. They publish well in advance notices of their intended shows and meetings.

Now don't get me wrong. I am well aware that British clubs visit with each other and that we, too, boast our globe-trotters. But I think that though science is creeping more and more into this hobby of ours, we still cannot beat the good old dissemination of know-how between one another, and this should not be restricted to just the small circle that comprises our own club or group.

Already within the pages of *PETFISH MONTHLY* we have read of voices claiming that we in Britain suffer from too many organisations and too little countryside co-operation. Perhaps a simple way for these groups to justify their existence would be to foster more the spirit of competition and spread of 'know-how', and not just within the confines of some geographical boundary.

Since my return to these shores I have delivered some two dozen lectures, and my travels have taken me both north over the Border and south to Old Father Thames; with just a few exceptions I do not find anything bordering on standardisation within the confines of the hobby.

Take a long, critical look at the average British fish show; not the large public affairs but rather the shows tagged with the term 'open'. A visitor for the first time could be forgiven if he thought he had wandered into a jumble sale, so diverse are the shapes, sizes and varieties of the containers housing the fishes.

In America they use either the drum bowl (similar to our goldfish bowls but having two flat, clear sides) or tanks. It might not be original but it does bring an air of ordered neatness to their shows. Couldn't our organisations get their learned heads together and agree on a similar idea for our set-ups?

I mentioned in my opening lines the envy you might have for their wide array of equipment, yet at times the fish houses I saw were as far away from the glossy magazine advertisements as Mark Twain's Mississippi

boatmen were from the men of the Stone Age: improvisation was the key word and they have it off to a fine art.

Old baths, refrigerator liners, even wooden boxes lined with polythene, all had been pressed into service. Two hobbyists I met were breeding fighting fish successfully in pickle jars!

Making one's own all-glass tanks was the latest craze, and I was told in no uncertain terms the advantages of these over metal-framed tanks: no glazing compound cozing out of seams to provide breeding grounds for harmful bacteria, cleaning and sterilisation made easier for the breeder and the ability to make them whatever size and shape your fancy dictates. Perhaps as the new epoxy resins reach these shores the habit will catch on?

Size and Colour

There is no denying that the fishes I saw were on average much larger and much more colourful than those I have been used to over here. That some of this owed its success to the use of hormones and chemicals cannot be denied, but I met aquarists who didn't use these 'additives' and still achieved better results than us.

Probably this is because anything they take on they take seriously; whereas here fish-keeping is a hobby to while away our leisure hours, to them it becomes a time-consuming passion.

Live foods such as *Daphnia* and tubifex were scarce and expensive; in one State I couldn't find one store that sold tubifex; in their place were lashings of adult brine shrimps and frozen foods in abundance. Refrigeration is as much a part of the American scene as the Star-Spangled Banner (one of the things I missed on my return was the clink of ice cubes as they slither down a glass; everything they drink is ice-cold and that even includes tea!).

The main problem preventing the distribution of frozen foods in Britain (and I speak here as a dealer with experience) is the high cost of providing refrigerated containers. How many pet shops of your acquaintance boast an ice box? Though I cannot see frozen fish foods becoming as common as the frozen foods in our groceries, I don't see any reason why the aquarist cannot experiment with his own.

On the subject of fish food, one very popular item of fish diets in America is ox ('beef') heart; cooked quickly and chopped fine it is a cheap and nutritious addition to the menu. If an ox heart is too much for your requirements why not get club members to take it in turns to prepare one and bring the surplus along to the meetings for distribution? Taking it in turns would mean you would all have a cheap and trouble-free food.

Club secretaries—are you troubled by members arriving late? Then take a leaf out of the American aquarists' book and give away tickets to those members who arrive before time; available for what is called a 'door prize', the distribution of these tickets stops when the meeting commences. Make the rewards worthwhile and you won't be disturbed whilst you read the Minutes.

All Good Things . . .

The time for my departure came around all too soon

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A course
for the
would-be
breeder of
tropicals

Part 3

D. B. McINERNY discusses



The Breeding of Egglayers

THERE are quite a few egg-laying species that will live and breed equally well in slightly hard alkaline water, such as *Hemigrammus cassiditratus*, *Hyphessobrycon schulzei*, *Melanotaenia maccullochi*; also such fishes as *Apistogramma ramirezi*, and *Telmatherisa ladigeni*, but this last-named species is extremely touchy about the slightest change in the water, and I shall deal with this later on.

When attempting to breed egglayers it is necessary almost to reverse the process given for livebearers, inasmuch as the first consideration, instead of the last, is the matter of food for the newly hatched fry. It is quite useless to breed a batch of egglayers unless one has a good supply of minute food in hand, and multiplying steadily. To get a good start these fry require mainly live foods such as *Infusoria*, brine shrimps and, later on, micro-worms. It is true that there are on the market various brands of fry food contained in tubes or tablets,

but for the aquarist who intends to breed fishes in quantity it is much cheaper and more satisfactory to produce natural live foods. Thus in breeding egglayers a supply of *Infusoria* must be started several days before the parent fish are put out into a breeding tank to spawn.

I am amazed at the number of aquarists who tell me they have bred various egglayers only to lose most, if not all, of the fry within a few days of hatching. The answer is nearly always starvation. Even those aquarists who do start a culture before spawning the parent fish fail to realise the quantity that is going to be required. A single infusorian such as *Paramecium*, only clearly seen under a microscope, cannot provide a large meal to the smallest fish fry; if this tiny fry has to swim its own length to catch a single *Paramecium* and then turn and swim twice its own length to grab another organism, it is burning up more energy in the chase than the ultimate food

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Pair of
*Melanotaenia
maccullochi*,
breeders not
minding slightly
hard water

Photo:
A. van den
Nieuwenhuizen

Swimbladders are Versatile Organs



By R. McN. ALEXANDER

University College of
North Wales

Orfe in outline with swimbladder marked in black

IF no fish had swimbladders, there would be far fewer aquarists in the country—or so I suspect. It is because they have swimbladders that so many fishes, such as characins and angels, can hang in mid-water, neither rising nor sinking, and making only the most gentle movements of their fins. The effect is delightfully peaceful. It can also be most impressive, as when one observes the ease with which a large pike stays stationary in the middle of its tank in one of the big public aquariums.

A fish without a swimbladder is denser than water. It will sink if it doesn't swim actively. It must either rest on the bottom (like flatfish) or simply not rest (like mackerel). It would in any case be disastrous for mackerel to rest, because these extraordinary fish can only make enough water flow over their gills to keep themselves from suffocation by swimming constantly with their mouths open.

Cartilaginous fishes, such as the marine sharks, haven't got swimbladders. Nor have some bony fishes, such as flatfish and mackerel. Most bony fishes, however, have swimbladders. The swimbladder is a bag of gas inside the body, just under the vertebral column, and it buoys the fish up in the same way as an inflated rubber ring can buoy up a swimmer.

A swimmer is already buoyed up by the air in his lungs. When he wears a rubber ring the combination of swimmer and ring is a good deal less dense than water. This suits the swimmer if he wants to float at the surface. It would not suit a fish which wanted to hang in mid-water. The swimbladder is usually almost exactly the right size to make the fish the same density as the water in which it lives.

The size required varies from species to species. A fish that has a massive skeleton and thick scales needs an unusually big swimbladder. A fish that lives in the sea doesn't need as big a swimbladder as a similar fish that lives in fresh water because salt water is denser than fresh. Sticklebacks and some killifish can live in either fresh or sea water, and reduce the size of their swimbladders when they go into the sea. The process of adjustment takes about 3 hours.

Every schoolboy scientist knows Boyle's Law, which

describes how the volume of a quantity of gas depends on the pressure. When the pressure increases, the gas is compressed to a smaller volume. Because of this, swimbladders have a serious disadvantage which was first pointed out by a contemporary of Robert Boyle in 1675. The pressure in water increases with depth. As a fish swims down its swimbladder is compressed to a smaller volume, and as it swims up the swimbladder expands. There is only one depth at which the swimbladder is the right size, unless the quantity of gas in it is adjusted.

Adjustments to Volume

Fishes adjust the quantity of gas to suit long-term changes of depth. The perch in Lake Windermere, for instance, live in the shallows in summer but move to depths of 40 ft. or more in winter. At 40 ft., the pressure is more than twice as great as at the surface and the swimbladder would be reduced to less than half its size if extra gas were not added to inflate it. Extra gas is added—and while that extra gas is in the swimbladder the perch cannot visit the surface without injuring themselves. If a perch is caught at 40 ft. and hauled to the surface, the gas expands so much that the swimbladder bursts. The fish arrives at the surface dreadfully swollen with gas, and floats helplessly at the surface if it is released.

Many sea fishes make big daily changes of depth. The most remarkable are the oceanic lantern fishes which spend the night at the surface and retire to depths of as much as 1000 ft. by day. It would be impossible to adjust the amount of gas in the swimbladder for such rapid changes of depth. These fishes have swimbladders of the right size at night when they are at the surface but almost certainly make do with undersized compressed swimbladders in the depths by day.

Some fishes, such as trout and characins, have a tube leading from the swimbladder to the throat. This can act as a safety valve, allowing gas to escape from the swimbladder when they swim upwards. It can also be used (when the fish is at the surface) for gulping air into the swimbladder. Other fishes, such as perch and cichlids, have no such tube. All fishes, whether they have the tube or not, can adjust the amount of gas in

the swimbladder by absorbing gas into the blood or releasing dissolved gas from the blood. These processes are slow. It usually takes between an hour and a day to adjust fully for a 10 ft. change of depth.

Absorption of gases from the swimbladder is no more difficult to understand than the absorption of oxygen into the blood in our lungs. The release of gases into the swimbladder offers more of a challenge to the zoologist. It is particularly hard to understand how fish living at great depths, and so great pressures, can fill their swimbladders with gas. Fishes with swimbladders have been caught a mile deep in the sea, where the pressure is over a ton per square inch.

This problem, which has interested zoologists for a long time, seems to have been solved in the last few years by brilliant research in Switzerland and Norway. Experiments on eels have shown that when the swimbladder is being inflated, lactic acid is released into the blood in the swimbladder wall (lactic acid is a common chemical in animals; it is for instance formed in our muscles when we dash for a bus). The lactic acid makes gases, and especially oxygen, less soluble in blood. Its direct effect is small, but it is immensely magnified as a result of a special arrangement of blood vessels.

The blood vessels of the swimbladder double back on themselves, so that the outgoing vessels lie very close to the incoming ones. Some of the dissolved gas, made less soluble by the lactic acid, diffuses from the outgoing blood to the incoming blood. This leads to a build up of gas concentration in the blood at the swimbladder, and eventually gas is released from solution into the swimbladder. This mechanism is capable of inflating

swimbladders even at great pressures in the depths of the sea.

So far we have talked only of swimbladders as floats, but in many fishes they also act as hearing aids. Sound-vibrations in water are greatly amplified near a bubble of gas—or a swimbladder. The carps, loaches, characins and catfishes all make use of this by having an arrangement of tiny bones connecting the swimbladder to the ear. The swimbladder amplifies sounds up to about 100 times, making these fishes much more sensitive to sound than other fishes. They seem to be able to hear just about as well as we can. This doesn't mean you should turn the television down in case the noise is too much for your fish's sensitive ears! Most of the sound in a room is reflected from the surface of an aquarium, and loud noises in the air will only cause much weaker sounds in water.

Some fishes that have bones connecting the swimbladder to the ear have very tiny swimbladders. Kuhli loaches and sucking catfish are examples. If you watch them swimming, they are obviously much denser than water. Their tiny swimbladders are no use as floats, but they are still useful as hearing aids.

In some fishes the swimbladder is useful in yet other ways. Piranhas, among others, have special muscles which set the swimbladder vibrating and produce grunting noises. I didn't know this till I caught my first piranha, and found the noise very disconcerting! Some fishes use their swimbladders as lungs.

The swimbladder is a wonderfully versatile organ. It is no wonder that a good many scientists have devoted their lives to studying it.

The Breeding of Egglayers

Continued from page 107

value will provide. A human baby left on a tiger-skin rug with its bottle a foot away cannot get the bottle, and will starve. Similarly, a tiny fish will starve unless the food is so plentiful that, instead of trying to reach it, the food will come to it. One mouthful then will replace the lost energy, and also provide sufficient for the growing needs of the fry.

Of course, spawnings vary in quantity, but some species can produce over ten thousand fry in one hatching. Such a spawning will require a hundred times the quantity of food that a smaller batch of one hundred would need. A good pair of *H. scholzei* or *H. caudovittatus* can produce spawnings of three to five hundred fry, and such a quantity is going to need at least two 2-lb jam-jars full of thick Infusoria every day for at least a week. After a week newly hatched brine shrimps may be added to the diet and the Infusoria gradually lessened. After a further ten days a small quantity of micro worms may be introduced, and slowly the brine shrimp reduced until the fry are taking mostly micro worms. One cannot make a hard-and-fast rule about this fry menu as a good deal depends on the type of fish being raised. Infusoria is free-swimming, so is evenly distributed throughout the volume of water. Newly hatched brine shrimps, though

free-swimming, usually tend to sink and occupy the lower strata of water; whilst micro worms do not swim and slowly sink to the bottom of the tank. If the fry come from species which are surface or mid-water feeders they may not get all the brine shrimps, and very few of the micro worms. They will feast on these as they sink through the water, but once on the bottom very few are consumed.

When egglayers have been spawned in a bare tank of water with only nylon mops or willow root, the micro worms wriggle on the bottom where some are seen and eaten by the fry, and the swimming motions of the fry and/or aeration, if used, tend to swirl the worms up so that more are caught and devoured. But where egglayers are spawned in a tank containing sand and plants, these minute micro worms soon sink between the sand grains, disappear and are lost as fry food. Indeed, too many will die and may cause fouling of the water. Once the fry have reached the size of new-born livebearers they may be fed a fine dried food.

In the next article I will deal with the production of Infusoria, brine shrimp and micro worms, and two or three methods of spawning the above-mentioned egg-layers.

DISEASES OF AQUARIUM FISHES Part Four

Fungus and Ill-Health

By Dr WILLIAM M. STOKOE, B.Sc., M.R.C.V.S.

(Dept. of Veterinary Anatomy, University of Edinburgh)

MYCOLOGY, the study of fungi, is only a relatively recent innovation in the field of animal pathology, and save for a few species of *Saprolegnia* there still remains a great deal to learn about the majority of fungal parasites to which fishes are susceptible. Yet the importance of mycology in pisciculture cannot be overrated, as, for example, up to 15% of some marine species are infected with one fungus or another.

Known Fungal Parasites

Be this as it may, *Ichthyophonus hoferi*, or, as it is often called, *Ichthyosporidium hoferi*, is one of the most widely distributed fungal species occurring both in fresh and marine waters, and recently in indoor aquaria. It is also one of the most lethal for fishes are infected through the digestive tube after feeding on contaminated material.

The parasite itself is classed with the Phycomyxetes. Basically, it is an encysted spherical or ovoid body containing several nuclei and granular inclusions, and reproduction takes place either by simple division into daughter cells or plasmodia, or by the growth of non-septate hyphae and subsequent formation of infective endoconidia.

The various stages of development of the fungus can in fact be found in any of the organs of infected fish, for on ingestion the parasite is freed by intestinal juices and germination takes place.

Thereafter, plasmodia or hyphae invade the intestinal epithelium, penetrate the submucosa and eventually enter the mesenteric blood vessels whence they are carried to all other organs, including the brain. Here they mature and eventually produce 1.5 µ wide endoconidia whose appearance is as varied as

their effect on the infected host.

Infection of the liver, for instance, produces loss of muscle substance, pallor of the skin, thrombosis of blood vessels and even total loss of fins. Infection of the brain on the other hand, causes loss of equilibrium, exophthalmus and staggering gait, whereas infection of the subcutis results in dermatitis and ulcerating skin lesions. There are even reports of sex reversal in guppies (*Lebistes reticulatus*) whose ovaries were invaded by the fungus.

Treatment of *Ichthyophonus* is largely confined to prophylactic measures, it being imperative that suspicious-looking fish are segregated or destroyed as early as possible, for even the smallest tag of skin likely to be eaten by other fish may contain an abundance of the infectious stages of the parasite. Equally, one fish disseminating such material from an external ulcer may be a source of infection to the whole population.

Otherwise, partial successes with fungicidal drugs such as phenoxethol and para-chlorophenoxethol have been reported when up to 200 ml. of a 0.1% solution is added gradually per gallon over 24 hours.

Saprolegnia and *Achlya*. *Saprolegnia* is probably the most ubiquitous of the aquatic fungi which attack domesticated fish, being both air- and water-borne. It should, however, always be regarded as a secondary parasite which becomes established only by means of defects brought about by other agents, whether skin injuries or primary parasites.

Germinating from such foci however, *Saprolegnia* rapidly spreads over the skin surface in the form of a spore-bearing mycelium, which gradually penetrates the epidermis, the dermis and in exceptional cases even the muscles and endoskeleton.

Initially though, the parasite which

may belong to the genus *Saprolegnia*, or to the closely-related *Achlya*, attacks only the surface epithelium where it is quite accessible to topical treatment with a wide range of fungicides. Potassium permanganate baths (1 gram in 100 litres of water for 90 minutes), and salt immersions (30 grams of sodium chloride in 1 litre of water), further copper sulphate treatment (5 grams in 10 litres of water), or painting with tincture of iodine are all highly efficacious, though it should be emphasised that *Saprolegnia* is most likely to develop in very alkaline waters or in tanks lacking strict supervision. It thrives on unoccluded food particles and, indeed, on any other dead protein matter, particularly in poorly oxygenated tanks.

Prime treatment therefore should consist of improving tank hygiene and aeration, stricter feeding controls and reduction in numbers of inhabitants of over-populated tanks.

Diseases Due to Non-specific Factors

In general, fishes are adapted to the temperature variations of their immediate environment and little more. Freshwater aquarium fishes tend to come from fairly still waters which may undergo fairly wide changes in temperature but which do not change suddenly. When these waters are tropical, their temperature does not fall below 65 to 70°F (18-21°C), but it may rise slowly to over 100°F (38°C), and therefore tropical fishes can cope with this kind of range.

Chilling. The sudden exposure to a change in temperature of more than 2 to 3°F (1-2°C) downward, however, is extremely likely to cause shock, followed by disease. Consequently, for complete safety it is always advisable to avoid rapid changes of more than 2°F (1°C), or slower changes of more than 5°F (3°C) per hour covering a total change of 5°F downward and 15°F (8°C) upward. Any greater changes than these will result in damage to those species, unless several days are taken up in achieving them. Nonetheless, it has been found that fishes arriving from a distance thoroughly chilled are more likely to recover without incident if they are placed

immediately in water at 70° to 80°F (21-27°C) than if time is wasted in raising the temperature gradually.

Otherwise, the commoner symptoms of chilling through fluctuations in water temperature are a characteristic slow, weaving motion in the water, often known as the 'shimmies', and, in serious cases, the development of the disease called 'white spot', or 'ich', which is caused by a protozoan frequently present in water but which does not usually gain hold in healthy fish.

Swimbladder disease. At the same time, fluctuations in room temperature can result in the chilling of surface-breathing fish like the anabantids. In such cases, the constant inhalation and storage of air at a cooler temperature than that of the surrounding water causes a severe inflammation of the branchial pouches and respiratory labyrinths which may well spread through the

pharynx and thence to the swimbladder via the pneumatic duct. If chilling continues, paralysis of the swimbladder may ensue, when the affected fishes 'stagger' through the water, and can reach the surface only with considerable effort.

Swimbladder upsets can also be the result of constipation or similar afflictions in which the volume of the internal organs increases. Alternatively, they may be due to a fatty degeneration of the tissues of the bladder itself in which case all that may be done to prolong life is to ensure a varied diet with adequate non-fatty live foods. Otherwise, general treatment of swimbladder complaints may be effected by transferring the fish to shallow containers with raised temperature, provided that the room and air temperatures be similarly raised and maintained in equilibrium.

Heat shock. The usual symptoms

of heat shock are gasping respiration—surface hugging and, occasionally, lack of equilibrium so that the affected fish turns slowly on to its side, plunges to an upright position and then repeats the process. Lowering the tank temperature is the obvious treatment and this can be more speedily effected by floating polythene bags containing a few ice cubes on the water surface.

Conclusions

In this series of articles I have endeavoured to cover some of the more common diseases of aquarium fishes with which the hobbyist may be called upon to deal. It is not my contention that the articles are detailed or even comprehensive, but an attempt has been made to indicate those conditions occurring in aquaria which are readily diagnosed and, for the most part, worthy of treatment.

Water at the Flower Show

AS always, a stretch of water, whether moving or still, greatly enhanced the appearance of all those garden exhibits including such a feature at this year's Chelsea Flower Show. The prize-winning garden layout, in the DAILY EXPRESS Garden Design Contest, incorporated water into the plan, although we thought that the rocky surrounds could have been raised to a slightly higher level to give greater effect; the impression of flatness detracted from the general appearance. Properly, the rockwork in this exhibit was of the moderate proportions that could be utilised by any amateur with a garden of reasonable size, but the grand effect of massive pieces of stone was beautifully given in the waterfall and pond exhibit by George C. Whitelegg Ltd. of Kent. One can never lose the feeling of wonder at the effect of matured permanency achieved with exhibits such as these, although it is known very well that a week before the water garden wasn't there and that it won't be there again the next week!

A display of greenhouse ferns that deservedly won a Royal Horticultural Society Gold Medal for the Borough of Slough Parks



Department caught the eye in the covered marquee section with its mass of greens of all shades and, yes!—set delightfully amidst mosses and ferns a very shallow gravelly strip of water. This was partly covered by a very dense carpet of

fairy moss (*Azolla*), a most unusual feature and a stroke of genius by the designers for this particular display.

No fish were to be seen in any of the pools we peered into—do these horticulturists fear some competition from the animal world?

STANDARDISATION OF VARIETIES OF GOLDFISH—2

Colour, Shine and Shape

By M. D. CLUSE

Vice President, The Goldfish Society of Great Britain

THE goldfish has an extraordinary number of variations in colour and form. The combinations of the various characteristics are numbered in thousands.

Analysis of the pigments has proved that only orange, yellow and black, and the red in the corpuscles of the blood, are present. The last-named shows only in the gills of healthy fishes when guanine is absent. Presence, absence or mixtures of these pigments give all the colours seen on or in the goldfish. The appearance of the colours, however, is modified by the presence or absence of guanine, a shining substance which acts as a mirror backing behind the scales. Where the 'shine' is absent it is possible to see through the scales and underlying tissue into the body, where black pigment appears to be an attractive sky blue.

The silver on goldfish disappears with the guanine and appears as white if there is no underlying pigment. Thus, on one fish, we can see orange, black, brown, blue, white, gold and silver. Fish like this came to be called 'calicos'. Some were described as 'scaleless', which, of course, was erroneous.

Unfortunately aquarists found that these fish did not 'breed true'. A simple genetic principle was at work. The normal fish was shining but a mutant without guanine had appeared. If the two types are mated the offspring are all of an intermediate form and are very attractive.

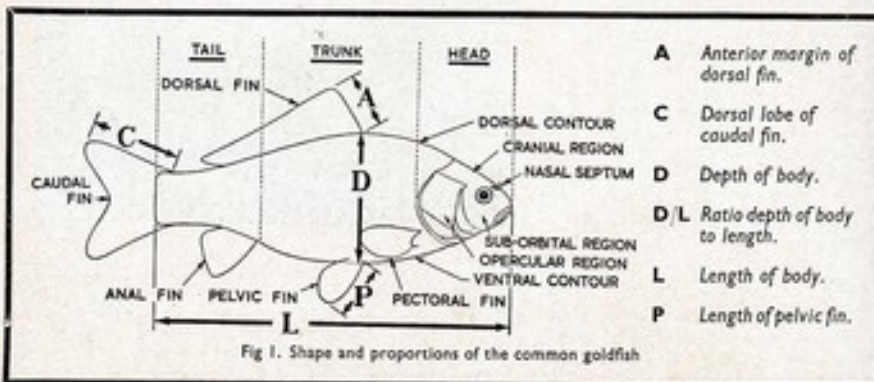
To make this easily understandable to breeders, the Goldfish Society of Great Britain decided to call the

shiny type (which included the bronze wild type) 'metallic' and to call the mutant type 'matt' as it had no shine. The intermediate type, which often had some shining scales and body areas with a mother-of-pearl appearance, was dubbed 'nacreous'.

Nacreous crossed with nacreous produces 25% metallic (usually olive bronze), 50% nacreous, 25% matt (often white and generally lacking in colour); metallic crossed with nacreous produces 50% metallic and 50% nacreous; matt crossed with nacreous produces 50% matt, and 50% nacreous. Metallic with metallic, or matt with matt, are true breeding. Regardless of the shape of any variety of goldfish it is genetically possible for it to have the metallic, nacreous and matt grouping. The Goldfish Society's standards therefore accept the three groups with each of its approved varieties, which are based on shape.

Fig. 1 shows the shape and proportions of a good normal healthy common goldfish and indicates the various parts of the anatomy which will be mentioned when descriptions are given of mutations that have occurred as listed below.

Body	Long or short
Fins	Long or short
	Pointed appearance or rounded appearance
Anal fin	Single or divided
Caudal fin	Single or divided
Pectoral fins	Both fins doubled (very rare)
Dorsal fin	Present or absent



Eyes	Normal or protruding outwards or upwards
	Normal or with bladder-like sacs below
Head	Normal or with raspberry-like growth
Scales	Normal or domed
Nasal septa	Normal or very enlarged
Gill plate	Normal or with outfolded operculum

Most of these variations were selected and bred by the Chinese over many generations and in some cases for hundreds of years. They are well worthy of preservation, but could easily become extinct if economic or social circumstances changed in the Orient. Père David's deer, formerly kept in the park of the Summer Palace at Peking, were released during the Boxer Rising and were saved from extinction by being bred at Woburn Abbey in England by the present Duke of Bedford's grandfather. Thence they were distributed to parks and zoos in various parts of the world. Several goldfish varieties have only a precarious foothold in this country. A few deaths of leading breeders or a very severe winter could wipe out these British strains.

It seems reasonable therefore to concentrate upon breeding a limited number of varieties but to ensure that all important characteristic variations are covered. For genetic reasons the extreme in each variation should be aimed for by the breeder, e.g. the body of the fish should be either slim or deep and rounded. Intermediate types should be discarded. Cross-breeding should be frowned upon. Varieties often produced as throwouts from really fancy varieties should not be recognised as approved for showing at competitive exhibitions because efforts and resources would be dissipated, e.g. 'nymphs', which are deep-bodied singletailed goldfish should be culled from the progeny of twin-tails or veiltails which have divided caudal fins.

The Goldfish Society of Great Britain has formulated standards for eight main varieties, which among them include every important variant characteristic. Moreover it is intended that none of these approved varieties will produce young unlike their parents but acceptable on the show table as another variety.

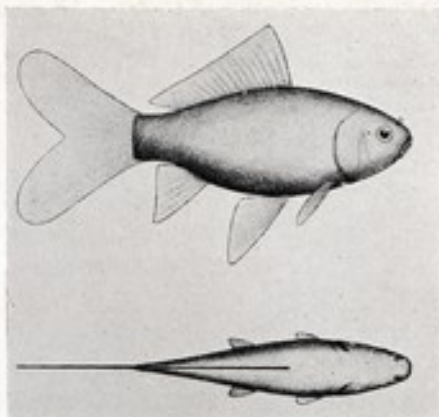


Fig. 2. Singletail goldfish

Fig. 2 shows a fairly simple mutation. The fish has long fins. In its nacreous or matt form this is similar to the variety known in the hobby as the 'Bristol shubunkin'. The goldfish variety depicted is the Goldfish Society's singletail, which, of course, covers metallic, nacreous and matt types. Special characteristic points are allotted for 'intensity of colour' and 'carriage of caudal fin'. This is very important because singletailed fish with drooping tailfins are considered to be unattractive. These extra marks are awarded to encourage breeders to pay special attention to these genetic factors. The Goldfish Society always allots additional marks to the special characteristic of each variety to encourage the retention of the special variations in the extreme form.

A Look Back in Admiration

Continued from page 106

and I reluctantly said farewell to the many friends I had made during my short stay.

I don't claim to have seen every facet of the aquarium hobby over there but what I did see I saw with my eyes wide open and I liked what I saw.

If you do get a chance to visit the New World, don't be in a hurry to form opinions from what you see in New York. Reserve your judgement until your steps take you further West: there you will find hobbyists willing to welcome you into their homes, show off their set-ups with pride and jaw away into the wee small hours.

That we can teach each other there is no denying, and what better way of furthering the hobby by an exchange

of correspondence between fish-keeper and fish-keeper, club and club? To take it a stage further, why not an exchange of tape-recordings of activities? This would form a useful adjunct to any programme.

My scheduled flight from Kennedy Field had been delayed, and tumbling out of the plane with the threat of an hour's delay in front of me I wandered into the aeronautical museum.

As I stood on the roof of the terminal building later, I kept turning over in my mind the words I had read emblazoned on the museum's walls: 'Those who cannot remember the past are doomed to repeat it'.

To all those who showed me, a stranger, such a wonderful time, my grateful thanks. If my trip has helped to iron out just a few of the misunderstandings that exist between hobbyists of our two countries then it was well worth it.

It only goes to show we do not realise just what possible horizons open out when we take home that 'fairground goldfish' or let those brightly coloured pieces of activity we call tropicals into our homes.

Birth of a Cuttlefish

By HORST KIPPER

(Aqurientechnik, Germany)



THE wish to own a nice aquarium was the beginning of it all. I took my time with the set-up and the technical installation because this time I had a plan in my mind and I worked on it like Van Gogh. After having arranged loads of beautifully coloured corals, snail and mussel shells, I thought of having some animal life in it. Fish were out of the question during the first weeks. So I first kept invertebrates, tropical stone corals, starfish, mussels, sea cucumbers and snails. To give the tank a natural look I also had a series of algae.

My friends no longer considered me a fish hobbyist, as a marine tank without fish cannot be 'with it', so they said. Nevertheless I had great fun watching these little creatures wander about and feed. I was pleased to see them prosper happily.

Spawn Behind the Coral

From the start I knew that one stone coral concealed a mass of spawn on its rear side. After having looked it up in an encyclopaedia I learned that it was the spawn of a cuttlefish. The first of the pictures clearly shows the cuttlefish eggs with the already well-developed eyes. I gave their development all my attention because I was eager to know how it went on. I took pictures of the spawn at an exposure of 1/1000 second. After the flash of light the cuttlefish changed colour within the second. Certainly the worm in the tube shell (seen at the bottom right of picture 2) retired into its house. The pigment formation of the cuttlefish eggs clearly shows the positions of the still-folded tentacles (picture 2).

After 2 days two cuttlefish babies hatched and crawled over the gravel,

Picture 1. General view of the cuttlefish eggs

Picture 2. This should be compared with the front cover photograph, which was taken slightly before this one (the tube worm is protruding from its tube in the cover picture)

which was as big as them (picture 4). The gravel had a diameter of $\frac{1}{8}$ inch. In the foreground of this picture is a leaf of a *Chaetoptera* plant.

Of course, you can imagine that I made efforts to catch and bring up the cuttlefish. In the end I thought that the aquarium was the right place and that it had the proper food and living conditions. The cuttlefish moved all about the tank and over the front pane of glass (picture 3). Then I lost sight of them because of their size. The remaining eggs were later on considered dietary delicacies by a hermit crab and a tiger snail.

We do not always have the chance of watching life in its starting days in a marine tank, and I was glad to have this experience.



Picture 3. Young cuttlefish photographed on the aquarium glass



Picture 4. When you are a tiny cuttlefish the grains of gravel around you seem like huge rocks (the branching structure across the foreground is a piece of plant)

? Large Concrete Aquarium

Continued from page 100

aquarium. I intend making it out of concrete with a glass front but I have no plans to work on and also no idea how to seal the front glass on to the aquarium.

The proposed position for this large aquarium would influence the method of construction—i.e. whether the back and end walls are to be supported by adjacent structures or

whether these would be free-standing. If free-standing a brick construction with the interior surfaces faced with a waterproofed cement layer would be indicated, whereas if built against adjacent walls it would be easier to erect wooden shuttering about 4 in. away and behind which concrete could be poured to form the aquarium walls. It would probably be best anyway to make up

the front from bricks cemented together in such a way that a recess about 2 in. wide would be left for the glass panel, a length of 2-3 in. angle iron spanning this at the top providing a bearing surface for the top edge of the glass (alternatively a reinforced concrete bar, recessed for the glass, could be made in a box mould for this top piece). The inner surface of the brick front would need to be faced with cement. If the

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Round and About the Trade



Mr. Wingate opens the front panel of a tank to test water temperature

'COME South' said the advertisement, so off I went to historic Winchester to call on Mr W. A. Wingate at his retail aquarium supplies business in Market Street. Part of Mr Wingate's shop is devoted to general pets, with a very neat and tidy cage birds section, but the spacious aquatic section forms a quite separate display. He acknowledged that the aquarium side of the business is his main interest, kept up and constantly expanding since his attraction to the hobby at the close of World War II. Herpetology is also a favourite study, and a half-grown python that he has had as a personal pet for many years graced a large vivarium. 'Unfortunately I get little time to handle him regularly these days,' said Mr Wingate, 'so that I shall probably be donating him to Chester Zoo.' He explained that he has long been a keen visitor to this Zoo, which he considered to be the best in this country.

The shop's display of tropical aquaria are viewed through cut-outs in a smart wooden facing to the tiered tanks, and hinged panels swing out to give access for servicing or selling. Over the tanks I noticed both fluorescent and tungsten lighting in use and I asked Mr Wingate what his experience had been with the two types. He told me that he had noticed no difference in results in plant growth with fluorescent compared with tungsten, and said that in his

A Visit to Wingate of Winchester

experience even the 'cold light' type of fluorescent tube was not detrimental to plants.

There was also a very fine display of coldwater fishes of a variety of types, and Mr Wingate admitted a special fancy for the coldwater side of the hobby. A very fine and permanent-looking pond with foun-

this field is to support and foster any measures that will lead to an elevation of the 'public image' of the pet trade and for the specialist aquatic supplier in particular. Al-

though he thought that there was still too frequently to be found an apathetic attitude in the trade to achievement of an improved status, he could also see signs that made him very hopeful for the future.

When telling me of the way in which his business has grown, Mr Wingate stressed the important part played by his wife, both in front and behind the scenes.

At the time of my visit Mr Wingate was looking forward to visiting the German Pet Trade Fair in Wiesbaden in May, and he spoke enthusiastically about continental fish displays he had seen before. As I left Winchester after my short but enjoyable time there I found myself thinking that with ambassadors like Mr Wingate we had little to worry about the image of this trade abroad at any rate.

Anthony Evans



One of the banks of tropical tanks, with display cases beneath

tain on the floor of the shop was in fact disclosed to be only a temporary one made from a Plastolene liner turned over a surround of hollow concrete blocks and held with concrete slabs. A circulated water system is used for the permanent glass-fronted concrete coldwater tanks built against one wall with a rocky surround.

In the 18 years that he has been at Winchester, Mr Wingate has become a well-known figure to his many customers over a wide area of the south of England, and especially to those regular visitors from the towns of Basingstoke and Southampton. He is also a very well-known and popular personality in the aquatic trade, for he has long been active in the Pet Trade Association and is currently a member of the Management Committee of that body. He explained that his biggest interest in



Part of the coldwater section

AT the Pet Trade Fair held in Leicester last month in the Aquatic Trading section we saw exhibited a new plastic breeding trap, which gives provision for internal aeration whilst in use, named the **Windmill Breeding Trap**, introduced by Windmill Products of London.



Mr. E. R. Fenton, of Fanday Aquaria

A Trip to the Far East

HAVING been importing fishes from the days when licences were first granted after the second World War, I have found that it is practically essential to know your supplier personally and to meet him on his home ground. This has been my policy and in the days when I relied on the continent for supplies I used to visit my suppliers regularly and live and work with them for short periods; thus we got to know one another's difficulties. I have also encouraged them to do the same with me.

The business has grown very considerably with the years and now we import directly from all over the world. To carry out the same policy now involves a lot of money and poses quite a few other problems.

About three years ago, with Mr Marks of Exotictrade, London, I started importing from Malaya and other places in the Far East, and various suppliers from these places have been to see and stay with us, giving their points of view etc.

Early this year we both decided that a trip to Malaya etc. had now become essential, in view of the large quantity of fishes involved and the various problems connected with getting them to England in good condition. Passports were renewed, various injections taken and passage was finally arranged on a 707 during November. One fine Monday afternoon, with me still not fully convinced that I was going, we set off from London Airport at 3.30 p.m. and were quickly whisked to Zurich.

Forty-five minutes later we were off again, this time to Rome. Here we had 45 minutes to wander round a deserted airport and off again. The next leg should have taken us straight to Delhi, but we struck head winds and the pilot decided to land at Dhahran in the Persian Gulf for more fuel. This we did, in what was then the middle of the night. The temperature at Dhahran was about 84°F (29°C). Forty-five minutes later we were off again on the long leg non-stop to Delhi. We flew via Bombay and I watched the dawn come over the clouds, as we were then flying at about 36,000 ft.

At Delhi again a 45 minutes' wait in the middle of nowhere (and photos forbidden), and then off again to Kuala Lumpur with its very modern airport building. On the way we saw the snow-covered Himalayas on our left.

We disembarked at Kuala Lumpur to find that we were two hours late and our connection to Singapore gone. However, a little string-pulling got us a seat on a Comet, the last plane out for the night, and we eventually arrived at Singapore Airport about 9.0 p.m. Tuesday local time, having lost altogether 7½ hours on the trip. At Singapore, being a Free Port, Customs were not difficult and we finally arrived at the Raffles Hotel about 10.0 p.m.

By E. R. FENTON

Within half an hour of our arrival one of our suppliers had rung us up and was on his way to visit us, and in the middle of the night we had a meal in Chinatown and finished up at about 2.30 a.m. eating Satay at a street stall, thus becoming members of the Satay Club!

Work started early next morning when our friend called for us and took us to see various plant and fish farms in and around Singapore during Wednesday and Thursday. These visits continued with one or other of our suppliers.

The standard stock and growing tank used out East is a concrete structure 4 ft. by 2 ft. by 1 ft., made in one piece about 1 inch thick. These are supported on bricks or concrete blocks in double rows under a light wood and corrugated iron roof (just too low for a European to stand under).

Every place has several rows of these out in the open and also a concrete patio, again roofed with corrugated stands with the outer side and ends painted to keep out some of the light. If there is enough yard they may also have their own concrete-lined pools in the ground and also blocks of square pools, about 48 in. by 48 in., above ground and about 18 in. deep.

The open pools usually have water hyacinths floating on the top and this plant is so plentiful that it is used for pig food in places. Angel fish are bred in earthenware



Kissing gourami, this one a specimen of average aquarium size. Those seen by the author were 9 inches long!

jars about 2 ft. 6 in. high and about 1 ft. across the neck. Each jar has one pair of angels and three or four water hyacinths. The farmers buy these jars from Chinese egg-importers for, I believe, four dollars (98 48) each.

We saw one farm at an old friend of Mr Marks where there was a pool with around 30,000 kissing gouramis. Here we saw the breeding stocks, which were magnificent specimens all of 9 inches long.

We also saw quite a number of aquatic shops in and around Singapore, and these again followed a similar pattern. Most of them were very clean and, how marvelous—no heaters, no thermometers, no thermostats, no insulation, no windows even. Most of the shops used three-tier 36 in. by 12 in. by 15 in. tanks and sold also concrete tanks with glass fronts, from about 18 in. by 10 in. by 10 in. up to 48 in. by 24 in. by 12 in. Plants were grown in shallow pools, not always lined, and we saw radicans and Amazon swords by the thousand.

On Friday we went to the Singapore Public Aquarium, which is a very fine layout with a good range of sea and freshwater fishes, but with practically no indigenous freshwater fishes; there were many specimen fish for size but generally the fish were in poor condition and overcrowded. One-eyed, fungus-infected and lock-jawed specimens were well in evidence, which is a great pity. The Aquarium closes all day Friday and it was with difficulty that we got in (further stringpulling!).

On Saturday morning I was up at 4.0 a.m. and went

with another of our suppliers up country some fifty miles into Johore. Here we met some Chinese catchers at these premises and then went way out into the country and actually fished for harlequins in a stream, which was about three feet wide and up to five feet deep. The fish were caught two or three at a time in a big round net by wading up stream towards them, and they were then transferred by plastic cup into a five gallon can, which the catchers' assistant was floating in the water, as we waded up the stream. As we were fishing for the harlequins, half-beaks and rasboras etc. were then thrown back.

The hospitality was fantastic. Everything we wanted to see we saw, everywhere we wanted to go we were taken, wherever we called, within a few minutes of arrival, iced drinks were produced. In Geylang we were presented with two 3½ year-old spanner barbs 9½ inches long—yes, 9½ inches! Unfortunately these did not survive the journey home.

On Sunday morning a brief visit was made to friends at the Service Yacht Club, followed by a visit to a Chinese friend's house where we joined in the Chinese customs of taking pork, chicken, eggs etc. to celebrate the fact that his daughter was four weeks old. Sunday afternoon was spent catching and packing fish for the evening flight to England and after seeing Mr Marks off on his plane we returned to my friend's house and continued the ceremonies, finishing up by taking little parcels all round Singapore to his and his wife's friends and relations and fellow-workers.

On Monday, unfortunately, our other supplier's wife had to go into hospital, which upset my plans to go with him to Penang. Tuesday was spent again checking, packing and counting fishes for a further shipment on Tuesday evening. Wednesday was spent shopping and on a sightseeing trip round Singapore Water Front. At 7 a.m. Thursday I was off again, this time in a V.C.10 to Ceylon.

My general conclusions are that fishes tend to be overcrowded and under-fed; wild fishes do not always have enough time to acclimatise themselves and here we do not keep our wild fish warm enough (most tanks in Singapore seem to be at least 85°F (29°C)). Real Chinese food is good, including bird's nest soup etc., Chinese hospitality is wonderful and the meals, service and attention given by B.O.A.C. are second to none. I for one look forward to being able to revisit these places in the not too distant future.

? Concrete Tank

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front glass is to be in one piece it would need to be ½ in. thick.

A method of sealing that can be used, other than setting the glass into a thick layer of ordinary aquarium putty, is to stick a continuous length of flexible rubber tube all round the recess and to wedge the glass against this before the tank is filled. With

this method the pressure of the water keeps the glass in position and leaks do not occur. However, all the bearing surfaces must be flat, smooth and evenly lined up with one another to achieve this.

Sea Water Density

I am confused about the correct value for density of sea water. In an article I saw in a periodical recently in different places it was given as '25' and '25'. Also I am not clear about

the way the hydrometer should be used.

The water to be tested should be placed in a tall glass jar in which the hydrometer will float freely. With the surface of the water at eye level, read off the scale value on the stem of the instrument where the water surface crosses it. An average reading for good results in marine tropical aquaria is 1.025, sometimes written as 1025. It is not good practice to try to read the density with the hydrometer floating in the aquarium.



CAMBRIDGE & D. A.S. held the first show of the year at the beginning of May. Its successful outcome and the excellent attendance rewarded members for all their efforts and preparation. Mr Large of Slough (F.B.A.S.) presented the trophies and commented on the merits of the show and fishes. Prize-winners were: Mr R. A. Ott won the Simpson Cup for Best Fish in Show with a hi-fin swordtail and Mr P. A. Ward won the Breeders Cup (*platy variatus*). Coldwater: 1 and 3, Mr R. W. W. Betts; 2, Mr P. A. Ward. Best barb: 1, Mr R. W. W. Betts (clown); 2, Mr A. F. Hulyer (cherry); 3, Mr R. K. Edney (rosy). Livebearers: 1, Mr R. A. Ott (hi-fin swordtail); 2, Mr P. A. Ward (*platy variatus*); 3, Mr R. K. Edney (swordtail). Cichlids: 1, Mr G. P. Rivett (*C. feticum*); 2 and 3, Mr R. W. W. Betts (*Tilapia* and *P. kribia*). Anabantids: 1, Mr T. W. Isgrove (dwarf gourami); 2 and 3, Mr R. K. Edney (red fighter and thicklip gourami). Guppy: 1, Mr A. F. Hulyer; 2, Mr S. A. Bayley; 3, Mr T. W. Isgrove. Catfishes and loaches: 1, Mr A. F. Hulyer (armoured catfish); 2, Mr R. W. W. Betts (*Botia*); 3, Mr G. P. Rivett (*Botia*). A.O.V. egg-layers: 1, Mr R. W. W. Betts (red-tailed shark); 2, Mr G. P. Rivett (flying fox); 3, Mr A. F. Hulyer (*Aphyosemion callianum alb*). Best pair: 1, Mr A. F. Hulyer (*H. rosaceus*); 2, Mr B. Gantrey (nigger barbs); 3, Mr I. S. Cooper (Australian rainbows). Best brood: 1, Mr P. A. Ward (dwarf gourami); 2, Mr R. K. Edney (rosy barbs); Mr A. F. Hulyer (*Aphyosemion australe*).

Many other interesting exhibits were put on show by Mr Radford and Mr Human including axolotls, frogs, toads, terrapins and newts. There was also a selection of live foods, and exhibits of stick insects and colourful stamps.

At a table show held in May by the **PORTSMOUTH A.S.** results were: Labyrinths: 1, Mr E. Warren; 2, Mr M. Brooks; 3, Mr V. Hunt; 4, Mr P. Carlyon. Danios: 1, Mr R. Wylie; 2, Mr A. Smith; 3, and 4,

Mr R. Wylie. Minnows: 1, Mr N. Franklin; 2, Mr V. Hunt; 3, Mr G. Lawrence. Miniature furnished aquaria in jars: 1, Mr G. Marks (tropical); 2, Miss W. Ryder (cold-water); 3, Mrs J. Howard (tropical); 4, Mr J. Howard (marine). The show was judged by Mr J. Stillwell whilst Mr E. Warren spoke on the breeding and keeping of the danio.

ACCINGTON & D. A.S. members heard an interesting lecture at their May meeting given by the well-known authority on marine life in the Morecambe area, Mr Jones. He spoke of the marine life abounding in Morecambe Bay and illustrated the lecture with some very fine colour slides. His collection of preserved specimens was also much admired by the 14 members present. Results of the table show were: Any coldwater fish: 1 and 2, Mr H. Smith; 3, Mr J. Hodyetts. Any cichlid: 1 and 2, Mr C. Whitsey; 3, Mr Lally.

ACCIDENTS can happen at even the best organised gatherings and the collapse of a large table half way through the benching at the recent **PRESTWICH AND BURY A.S.** open show precipitated tanks, jars, fishes and water on to the floor. Mr T. Campbell, the show secretary, on behalf of the host Society, has requested that their appreciation and admiration of the behaviour of exhibitors should be conveyed to all concerned. Everybody sprang into action, another table was found, spare jars appeared as if by magic and in a miraculously short space of time only the wet floor remained to indicate that anything out of the ordinary had occurred. Mr Campbell writes: 'Not one murmur of complaint or criticism did I hear and I consider this is a splendid example of the bond which so closely unites people who keep fish as a hobby'.

THIS year the sixth annual open show of the Association of Yorkshire Aquarium Societies was organised by the **GARFORTH & D. A.S.** There were 237 entries from 22 societies and the host club had pleasure in welcoming visitors from as far afield as Merseyside and Newcastle, though disappointment was felt that some Yorkshire members of the A.Y.A.S. chose to support societies in other counties

rather than their own show. Many favourable comments were received from the visitors on the organisation of the show and on the first rate refreshments offered. Results were: Livebearers: 1, Mr C. Binns (Bradford); 2, Mr W. Hutson (Snaith); 3, Mr K. Swales (Swillington). Barbs: 1, Mr A. Firth (Bradford); 2, Mrs M. Firth (Bradford); 3, Mr J. Jackson (Leeds). Characins: 1, Mrs M. Firth (Bradford); 2, Mr K. Glover (Swillington); 3, Mrs Smith (Staithe). Anabantids: 1, Mrs M. Winfield (Garforth); 2, Mr K. Glover (Swillington); 3, Mrs Smith (Staithe). Fighters: 1, Mr P. Reynolds (Swillington); 2, Mr J. Baxter (Tadcaster); 3, Mr C. Binns (Bradford). Cichlids: 1, Mr W. Hutson (Snaith); 2, Mr J. Baxter (Tadcaster); 3, Mr I. Hunt (Sunderland). Livebearer breeders: 1, Mrs M. Firth (Bradford); 2, Mr K. Glover (Swillington); 3, Mr P. Clarke (Garforth). Egg-layer breeders: 1, Mr P. Bradley (Pontefract); 2, Mr N. Rumbold (Tadcaster); 3, Mr W. Hutson (Snaith). Catfish and loach: 1, Mrs Helm (Aireborough); 2, Mr C. Holdsworth (Bradford); 3, Mr F. Mulla (Merseyside). Coldwater: 1 and 2, Mr C. Booth (Bradford); 3, Mr C. Linley (Garforth). A.O.V.: 1, Mr R. Bean (Snaith); 2 and 3, Mrs Helm (Aireborough). Toothcarps: 1, Mr G. Holmes (Bradford); 2, Mrs Whitely (Staithe); 3, Mr C. Holdsworth (Bradford). Best Fish in Show was a chequer barb entered by Mr A. Firth (Bradford). Bradford A.S. were awarded first prize for the most points gained over the last year in open table shows throughout Yorkshire.

OWING to the rather small premises at present used by **UXBRIDGE & D. A.S.** the club has reluctantly decided to close its membership for the time being. A waiting list will be prepared, however, and intending new members will be able to add their names to it, and should notify the secretary, Mr N. V. Lee, 46 Airedale Road, Ealing, London, W.5. At the third table show of the season Mr Stewart judged 34 fishes. Prize-winners were: Egg-laying toothcarps: Mr McGaw (*Jordanella floridae*). Characins: Mr Summers (*Aryzoxax fasciatus*). Labyrinths: Mr Lee (thicklip gourami). Swordtails: Mr Sibley (red sword). Mr Shell won in the novice class with a Buenos

Aires tetra and the breeders' class award went to Mr Fitzwater with his entry of red platys.

GOSPORT & D. A.S. held their first annual general meeting on 5th May, when the officers elected were: chairman, Mr R. Flemming; secretary, Mr R. Betts, 25 Barnbrook Road, Salisbury Green, Hants; treasurer, Mr A. Perman; assistant and show secretary, Mr R. Flemming; auditor, Mr T. Cogan; management committee, Mr L. Follington, Mrs Macdonald, Mr L. W. Taylor and Mr A. Clague.

Meetings are held at the Bridge-mary, Rowner and Woodcot Community Centre, Brewers Lane, Gosport at 7.30 p.m. on the first and third Thursdays of each month. Table shows occur during the second monthly meeting and the results of the first table show were: any variety: 1 and 3, Mr Follington (bleeding heart tetra, red-tailed shark); 2, Master Macdonald (silver hatchet); 4, Master Perman (*P. kribiaensis*). New members can be assured of a warm welcome and interested fishkeepers are asked to contact the secretary.

A DECORATED home aquaria competition is part of the programme organised by **RUGBY & D. A.S.** for June and July. At the beginning of May Mr E. Bennett lectured on the less-known livebearers, giving 24 illustrations and explaining that most of these were not available owing to their predatory nature, peculiar breeding habits and often dull colouring. The table show for the evening was an eliminator for the last inter-society league show to be held at Coventry. Results were: Characins: 1, Mr R. Deacon (emperor tetra); 2, Mr R. Fox (emperor tetra); Mr R. Fox (cardinal tetra); 4, Miss V. Slatcher (bleeding heart tetra). Barbs: 1, Mr R. Fox (tiger barb); 2, Mr and Mrs Pearson (chequer barb); 3, Mr K. Russell (Stoliczka's barb); 4, Mr and Mrs Pearson (chequer barb); Breeder's egg-layers: 1, Mr and Mrs Pearson (*A. ramirezi*); 2, Miss R. F. Shaw (*C. ananias*); 3, Mrs R. Fox (tiger barbs).

THE FIRST meeting of the **YORK & D. A.S.** in their new headquarters took the form of an inter-society competition with **WAKEFIELD A.S.** Sixty-two people attended and were

entertained by a film show arranged by Mr Hawksby and an any variety table show for which 50 entries were received. Judges were Mr M. Faircliff and Mr A. E. Whitelock of Tadcaster and the high quality of the fish made judging very difficult. The plaque for the best fish in show went finally to Mrs Bingham of York with an upside-down catfish. 2, Mr Cotton (Wakefield, thick-lipped gourami); 3, Mr Cotton (Wakefield, comb-tail); 4, Mr Harrison (York, veil-tailed guppy).

AT the interclub show between **TAUNTON A.S.** and **YEOVIL A.S.** each club exhibited eight tropicals and six coldwater fishes in two separate classes. Both clubs had two excellent tropicals each and in this section honours went to the home club, who took first prize with a very good tiger barb and also third place with an excellent zebra danio. Yeovil's second prize winner was a very large *A. ramirezi* and fourth was a very colourful rosy barb. It was a different story, however, with the coldwater entries, with the visitors taking all four awards with some very high standard fancy goldfish.

While the judging was taking place the meeting was participating in a quiz with the chairman reading out the question and members checking each other's papers. After tea, Mr J. V. Morrice, the judge, was asked to give a talk and spoke on judging fishes and aquaria. The raffle prizes of two bottles of strong liquid refreshment were won by two members of Yeovil.

AT the Inter-Societies fish show held in May at which the **COVENTRY POOL & AQUARIUM SOCIETY** were the hosts, over 200 people attended. Rugby A.S. won the **COVENTRY EVENING TELEGRAPH** trophy and have gained a total of 80 points in the four shows held this season. The runners-up were Atherstone with 53 points, followed by Coventry (50), Leamington (47), Northampton (38) and Tamworth (20). The best fish of the show also belonged to a Rugby man, Mr R. Fox.

MIR A. MILLICHAMP, Fisheries Officer of the Uak River Authority was the guest speaker to the May meeting of the **NEWPORT A.S.** and gave a most interesting lecture on the

artificial propagation of salmon and trout, and indicated how such methods could be successfully adopted by the aquarist in the 'hand stripping' of goldfish and other coldwater species. Society member Mr T. G. Wall also provided a short talk on pond life. Members of the Society have been enjoying a very varied and busy period recently with shows at Cardiff, Keynsham and Llanwit Major. In addition the first 'leg' of the furnished aquaria competition is scheduled for June.

THE **MIDLAND ASSOCIATION OF AQUARISTS' SOCIETIES** annual convention and open show took place at Moseley Secondary School, Birmingham on 8th May, the host society being the **MIDLAND AQUARIUM & POOL SOCIETY**. The convention was most successful, attracting 28 affiliated societies and some 500 aquarists who listened to first-rate talks given by Mr J. Kelly of Manchester and Mr C. D. Roe, Shirley, Birmingham; Mr Anthony Evans, Editor of *PETFISH MONTHLY*, also addressed the assembly. The show received 368 entries in 30 classes, the largest entry being 29 in the gourami class. An *A. ramirezi* entered by Mr and Mrs Pearson of Rugby was judged best in show with 89 points and was awarded the convention trophy. Other award winners were: Furnished aquaria: Cheltenham and D. A.S. Plant class: Mr L. W. Male. Breeders' egg-layers: Mr Fairhurst. Breeders' livebearers: Mr and Mrs Delves. Singletail goldfish: Mr A. Roberts. Fantail goldfish: Mr Brelsford. Twintail goldfish: Mr A. Roberts. A. V. pond or river fish: Mr A. R. Haddon. Siamese fighters: Mr Hand. Gouramies: Mr and Mrs Hay. Barbs: Mr and Mrs Hay. A.O.V. barbs: Mr B. Taylor. Characins: Mr B. Woodward. Neons and cardinals: Mr D. Edwards. A.O.V. characins: Mr Hall. Danios and white cloud mountain minnows: Mr Skinner. Rasboras: Mr Payne. Tooth carps: Mr Payne. Angels: Mr Hand. Dwarf cichlids: Mr and Mrs Pearson. A.O.V. cichlids: Mr D. A. Thomson. Corydoras: Mr Palmerfield. A.O.V. catfish: Mr Leggett. A.V. loaches: Mr Vickery. Platys: Mr Hand. Swordtails: Mr and Mrs Delves. Mollies: Mr G. Rothin. A.O.V. livebearer: Mr B. Woodward. Non-F.G.B.S. guppies: Mr Ball. A.O.V. tropical fish: Mr Whitmee.

Chelsea A.S. Open Show



Above: Chelsea A.S. officials record results. Left: Entries at the Chelsea A.S. Show and (below) Mr Eisen judging coldwater fish



MEMBERS of aquarist societies last month received further glowing tributes, this time from the show secretary of **CHELSEA A.S.** On the day of the open show, which was held in Chelsea at the beginning of May, Mr Forrest writes that the club was extremely short of helpers, owing to a variety of mishaps such as broken arms and painful backs, and would have been in difficulties had not members of other clubs

given real assistance. He wishes to pay a special tribute to Mr A. Jamieson of the Freelance A.S. who arrived at the show early and promptly took off his coat and got to work setting up tanks and generally giving valuable assistance. It was even more appreciated when he stayed behind after the show to help in emptying the tanks and clearing up! Mr Forrest writes: 'It is assistance from other club members like this which goes to make this hobby of ours what it is, the finest hobby and the easiest way of making friends that can be relied upon in an emergency for valuable assistance and advice'. 'Total entries

(Below) After presenting the cup for best fish in the M.A.A.S. Show to Mr and Mrs F. Pearson (Rugby & D.A.S.), Mrs P. W. Jinks, wife of the chairman of the M.A.P.S., herself received a bouquet (right) from Jacqueline Edwards, daughter of the show secretary



numbered 431 (a club record) and awards were as follows.

A.v. platy: 1, Mr R. Giles (Independent); 2, Mr T. Asquith (Carlton); 3, Mr T. Leach (Reigate-Redhill); v.h.c., Mr G. B. Bass (Reigate-Redhill); A.v. swordtail: 1, Mr I. Macleod (Chelsea); 2, Mr M. Thomas (Froelance); 3, Mr T. Asquith (Carlton); v.h.c., Mr I. Macleod (Chelsea); A.v. mollie: 1, Mr T. Asquith (Carlton); 2, Mr J. Cobden (Carlton); 3, Mr J. Cobden (Carlton); v.h.c., Mr T. Smith (Willenden); A.v. male guppy: 1, Mr W. Wren (Bethnal Green); 2, Mr E. Shepperd (Hounslow); 3, Mr C. Swainburne (non-club member); v.h.c., Mr T. Smith (Willenden); A.v. female guppy: 1, Mr G. B. Bass (Reigate-Redhill); 2, Mr A. Jamieson (Froelance); 3, Mr G. Aylard (Kingston); v.h.c., Mr R. Giles (Independent); A.v.v. livebearer: 1, Mr R. Cooper (Kingston); 2, Mr R. Cooper (Kingston); 3, Mr F. Tomkins (Independent); v.h.c., Mr E. Arthur (Chelsea); A.v. toothcarp: 1, Mr M. Thomas (Froelance); 2, Mr J. Open (East Dulwich); 3, Mr W. Wren (Bethnal Green); v.h.c., Mr D. Collyer (Reigate-Redhill); Danio, rambora, minnow: 1, Mr R. Biggs (Kingston); 2, Mr G. E. Greenhall (Kingston); 3, Mr S. Battersworth (Chelsea); v.h.c., Mr C. Swainburne (non-club member); A.v. barb: 1, Mr W. Wren (Bethnal Green); 2, Mr H. Parker (Croydon); 3, Mr R. Gilbert (Dunstable); v.h.c., Mr J. Thorne (Hounslow); A.v. characin: 1, Mr J. Thorne (Hounslow); 2, Mr G. E. Greenhall (Kingston); 3, Mr B. Darbow (Clapham); v.h.c., Mr B. Barber (Thurrock); A.v. fighter: 1, Mr J. Baines (Dunstable); 2, Mr J. Chapman (Independent); 3, Mr D. Durrant (Thurrock); v.h.c., Mr J. Baines (Dunstable); A.v.v. labyrinth: 1, Mr J. Thorne (Hounslow); 2, Mr R. Stewart (Enth); 3, Mr J. Wilson (Carlton); v.h.c., Mr S. Mooney (Tottenham); Corydoras cota: 1, Mr R. Biggs (Kingston); 2, Mr S. Mooney (Tottenham); 3, Mr G. Aylard (Kingston); v.h.c., Mr R. Cooper (Kingston); A.v.v. tropical cota: 1, Mr G. E. Greenhall (Kingston); 2, Mr T. Smith (Willenden); 3, Mr D. Ellis (Kingston); v.h.c., Mr S. Battersworth (Chelsea) and Mr P. Meyer (Reading); Dwarf cichlid: 1, Mr D. Woodward (Hounslow); 2, Mr J. Chapman (Independent); 3, Mr R. Cooper (Kingston); v.h.c., Mr E. Shepperd (Hounslow); A.v.v. cichlid: 1, Mr D. Woodward (Hounslow); 2 and 3, Mr T. W. Glass (Willenden); v.h.c., Mr A. Jamieson (Froelance); A.v.v. tropical eyelet: 1, Mr S. Mooney (Tottenham); 2, Mr F. Ginger (Uxbridge); 3, Mr T. W. Glass (Willenden); v.h.c., Mr A. E. Bass (E. Dulwich); A.v. tropical loach: 1, Mr J. Cobden (Carlton); 2, Mr M. Williams (Harlow); 3, Mr G. E. Greenhall (Kingston); v.h.c., Mr V. Voysey (non-club member); Tropical livebearer livebearer: 1, Mr S. Mooney (Tottenham); 2, Mr I. Smart (Chelsea); 3, Mr M. Thomas (Froelance); v.h.c., Mr R. Cooper (Kingston); Tropical livebearer eyelet: 1, Mr J. Thorne (Hounslow); 2, Mr H. Parker (Croydon); 3, Mr R. Humphries (North London); v.h.c., Mr J. Cobden (Carlton); Common goldfish: 1, Mr B. Barber (Thurrock); 2, Mr B. Barber (Thurrock); 3, Mr T. Leach (Reigate-Redhill); v.h.c., Mr V. Voysey (non-club member); A.v. shubunkin: 1, Mr R. Whittington (Reigate-Redhill); 2, Mr R. Whittington (Reigate-Redhill); 3, Mr T. Leach (Reigate-Redhill); v.h.c., Mr R. Barber (Thurrock); Tropical goldfish: 1, Mr S. Hes (Carlton); 2, Mr S. Hes (Carlton); 3, Mr T. Leach (Reigate-Redhill); 2, Mr A. Jamieson (Froelance); 3, Mr T. Leach (Reigate-Redhill); Best fish in show: Mr R. Whittington (shubunkin); F.B.A.S. award for the best catfish or loach: Mr R. Biggs (Kingston); Corydoras paucatus: winners of the interclub trophy were Kingston A.S. with 27 points. Judges were Messrs Howe, Essen, Brown and Jessopp.



With cup and rosette for best fish at the Wimbledon Show, Mr R. Biggs

OFFICERS and members of the WIMBLEDON & MERTON A.C. declared themselves delighted with the results of their first open show held on 21st May in London. Mr R. E. Dudley, chairman, wishes to convey to all who participated his thanks for their help in making the show a success, and not least to the F.B.A.S. judges, Mr Essen, Mr Brown, Mr A. Jessopp and Mr W. Kemp. Results were:

A.v. swordtail: 1, Mr G. Greenhall (77 pts, black sword); 2, Mr W. Wren (73, green sword); 3, Mr G. Greenhall (72, Berlin sword); A.v. platy: 1, Mr J. Thorne (78 pts, marigold platy variegata); 2, Mr D. Ellis (76, marigold platy variegata); 3, Mr G. B. Bass (74, red wagtail); 4, Mr I. Garbutt (73, red platy); A.v. molly: 1, Mr J. Thorne (73 pts, black sailfin); 2, Mr D. J. Woodward (73, wilders); 3, Mr C. Felleman (71, black molly); A.v. rambora, danio, minnow: 1, Mr R. Biggs (84 pts, R. jacobsoni); 2, Mr G. Greenhall (81, R. jacobsoni); 3, Mr W. Wren (76); Danio devario: 1, Mr G. Greenhall (76, R. oligatus); A.v. characin: 1, Mr G. B. Bass (84 pts, neon); 2, Mr J. Thorne (84, pencil); 3, Mr G. Greenhall (83); A. (tomatidate); 4, Mr J. Thorne (85, bleeding heart); A.v. barb: 1, Mr W. Wren (81 pts, tiger barb); 2, Mr J. Thorne (80, B. ichthost); 3, Mr D. J. Woodward (78, chequer barb); A.v. cichlid: 1, Mr C. Felleman (74) pts, dwarf cichlid); 2, Mr D. J. Woodward (74, blue acraea); 3, Mr R. Bush (70); C. uteroni; A.v. corydoras cota: 1, Mr R. Cooper (84 pts, C. pado); 2, Mr G. Greenhall (81, C. trochil); 3, Mr R. Biggs (81); C. paucatus; A.v.v. catfish, loach or botia: 1, Mr G. Greenhall (78 pts, Clarias); 2, Mr D. Ellis (77, Pterostoma); 3, Mr N. Packman (74, Brookia australis); A.v. eyeletting toothcarp: 1, Mr D. J. Collyer (82 pts, Aphysosoma aberti); 2, Mr D. J. Collyer

(79, P. parvum); 3, Mr R. Cooper (78, Epiplatys melanostictus); A.v. fighter: 1, Mr A. Woods (75 pts, blue); 2, Mr N. Packman (70, blue); 3, Mr R. Cooper (68, red); A.v.v. labyrinth: 1, Mr J. Thorne (78 pts, dwarf gourami); 2, Mr D. Ellis (74), bleeding gourami); 3, Mr J. Thorne (76, dwarf gourami); A.v.v. tropical: 1, Mr W. Wren (84 pts, silver shark); 2, Mr G. Greenhall (81, black shark); 3, Mr R. Cooper (79, Gambusia affinis holbrooki); 4, Mr R. Browning (78, Malanostoma fluviatilis); Breeders eyelet: 1, Mr D. J. Collyer (76 pts, Aphysosoma carolinense); 2, Mr D. Ellis (73, Aphysosoma fluviatilis); 3, Mr J. Thorne (71, Jack Dempsey); Breeders livebearer: 1, Mr C. Felleman (74 pts, half-beak); 2, Mr R. Cooper (69, merry widow); 3, Mr J. Stockwell (66, guppies); 4, Mr J. Stockwell (64, guppies); A.v. common goldfish: 1, Mrs W. Voysey (82) pts); 2, Mr K. Hope (82); 3, Mr D. Ellis (77); A.v. fancy goldfish: 1, Mr D. Dudley (87 pts, black moon); 2, Mr D. Dudley (86, orange); 3, Mrs M. Dudley (84, lion-head); Miniature furnished square: 1, Mr J. Stewart (66 pts); 2, Mr G. B. Bass (64); Best fish in show: Mr R. Biggs (R. jacobsoni); Results for the open guppy show were: Best male: 1, Mr W. Wren; 2, Mr A. Goodall and Mr W. Moonilla; Best female: 1, Mr A. Goodall and Mr W. Moonilla; 2, Mr G. Goodall; 3, Mr G. Goodall.

MERSEYSHIRE A.S. members found the recent slide show given by Mr Barry Pengilly both instructive and enjoyable. The slides were of superb quality and included many of marines, and the lecturer gave a full description of each fish and answered questions about it. At the next meeting, club members took part in an auction when many attractive fishes and plants changed hands.



Wimbledon & Merton A.C. secretary Mr C. Harrison checks the furnished mini-task entries

HEYWOOD & D. A.S. held their second annual open show on 15th May. Mr W. H. Smith and Mr G. Collins were the judges. The following is the list of awards:

A.v.v. goldfish: 1, Mr R. Birch (Heywood); 2, Mr E. Davies (Heywood); 3, Mr T. Butterworth (Gosport); 4, Mr J. Sutton (Oxram); 2 and 3, Mr Hoop (Salford); Malins: 1, Mrs Wardle (Prestwich & Bury); 2, Mr Gardner (Stretford); 3, Mr Reynolds (Swillington); Swordtails: 1, Mr Wood (Prestwich & Bury); 2, Mr B. Whitehurst (Stockport); 3, Mr Cross (Blackpool); Plaity: 1, Mr G. Rich (Stockport); 2, Mr L. McCourt (Gorton & Openshaw); 3, Mr Huxley (T.A.B.); Barbs (small): 1, 2 and 3, Mr F. Gregory (Oxram); Barbs (large): 1, Mr Kilner (Heywood); 2, Mr H. W. Hughes (T.A.B.); 3, Mr M. Spencer (Heywood); Labras and shufus: 1, Mr William (Valley); 2, Mr K. Willeham (Oxram); 3, Mr Gardner (Heywood); Loaches: 1, Mr Gardner (Stretford); 2, Mr K. Hill (Heywood); 3, Mr Grundy (Lough); Catfish: 1, Mr L. McCourt (Gorton & Openshaw); 2, Mr H. W. Hughes (T.A.B.); 3, Mr K. Willeham (Oxram); Anabantids: 1, Mr Parkin (T.A.B.); 2, Mr Ryland (Lough); 3, Mr K. Hill (Heywood); Fighters: 1, Mr Jennings (Prestwich & Bury); 2, Mr Kay (Huddersfield); 3, Mr Muller (Merseyside); Cichlids (small): 1, Mr Malby (Oxram); 2, Mr Pawley (T.A.B.); 3, Mr Muller (Merseyside); Cichlids (large): 1, 2 and 3, Mr Malby (Oxram); Angels: 1, Mr J. Wood (Heywood); 2, Mr G. Hodgkinson (Gorton); 3, Mr J. Logan (Gorton & Openshaw); Characins (small): 1, Mr Gregory (Oxram); 2, Mr S. Gillidge (T.A.B.); 3, Mr T. Hallett (Clitheroe); Characins (large): 1, Mr H. W. Hughes (T.A.B.); 2, Mr Parkin (T.A.B.); 3, Mr Muller (Merseyside); Characins (medium): 1, Mr Winter (Mossden); 2, Mr J. Robinson (Merseyside); 3, Mr A. Feunlay (Stockport); Tooth cups: 1, Mr K. Willeham (Oxram); 2, Mr P. Reynolds (Swillington); 3, Mr J. Robinson (Merseyside); Denton: 1, Mr T. Davies (Heywood); 2 and 3, Mr A. Beasley (Heywood); Rabbots: 1, Mr F. Gregory (Oxram); 2, Mr J. Robinson (Merseyside); 3, Mr H. Jones (Merseyside); Breeders livebearers: 1, Mr J. Sutton (Oxram); 2, Mr W. J. Horton (Salford); 3, Mr Butterworth and Mr Jeffries (F.G.A.); Breeders egg-layers: 1 and 2, Mr K. Willeham (Oxram); 3, Mr Backley (Prestwich & Bury); Pairs livebearers: 1, Mr P. Reynolds (Swillington); 2, Mr G. Rich (Stockport); 3, Mr W. T. Horton (Salford); Pairs egg-layers: 1, Mr F. Gregory (Oxram); 2, Mr L. McCourt (Gorton & Openshaw); 3, Mr Helms (Airedale); A.v.v. tropical: 1, Mr G. Hodgkinson (Gorton & Openshaw); 2, Mr Helms (Airedale); 3, Mr D. Kilner (Heywood); Juniors a.v.v. tropical: 1, Mr D. Hodgkinson (Gorton & Openshaw); 2, J. T. Sutton (Oxram); 3, T. Harris (Heywood); Juniors a.v.v. cold-water: England and Ribblesdale (Heywood); 2, F. Taylor (Heywood); 3, S. Birch (Heywood).

CRAWLEY COLLEGE A.S. were visited by Kingston A.S. on 24th May for a return contest, which was judged by Mr G. D. Forrest, F.B.A.S. judge. Kingston obtained 1223½ points to Crawley's 1198½ and individual results were: 1, Mrs J. H. Partridge (Crawley, *Nannostomus anomali*); 2, Mr Greenhall (Kingston, Berlin sword); 3, Mr T. Goggin (Crawley, *C. paleatus*).

THE resignation of the chairman of **GLOUCESTER & CHELTENHAM A.S.**, Mr Barry James, owing to

business commitments, was accepted with great regret at the May meeting of the club. His efforts on behalf of the society had been greatly appreciated and it was hoped that in time he would be able to resume a more active role again. Mr Rees Hayden was unanimously elected as the new chairman, and Mr Norman Binding was elected a committee member. It was agreed at this meeting that a number of fish of uniform size should be bought for sale to members so that they could be judged at a later date in the year. The club visit to the M.A.A.S. convention was described to those members who had been unable to attend. It had proved a very enjoyable day and members had been particularly interested in the talk by Mr Jim Kelly. The first and second prize in the furnished aquaria class had also been achieved by the society. Intending new members will find a warm welcome at the club meetings held on the second and fourth Wednesday of each month in Christ Church Hall, Malvern Road, Cheltenham.

MEMBERS of the **NOTTINGHAM & D. A.S.** were vastly entertained by a talk given by Mr W. L. Mandeville on the subject of the relation of competitive shows to fishkeeping. Tracing the history of competitions back to the coldwater fancy, Mr Mandeville maintained that it was from the enthusiasm of this group of people that we have shows of today's standing. At this meeting, the table show for characins under 3 in. was won by Mr K. Riley (56 pts, headstander); 2, Mr Thorpe (72 pts, cardinal); 3, Mrs Bullyment (71 pts, neon). In the catfish class, Mr Colton won a first with a corydoras (75 pts); 2, Mr Riley (74 pts, kuhli loach); 3, Mr Bullyment (60 pts, *C. ornatus*). Through the monthly Bulletin, show secretary Mr W. J. Christian is presenting to the club the question of whether or not it will be possible for members to participate at the F.N.A.S. show at Belle Vue later this year. Assistance from a few individual club members may well make this possible.

Midland Open Show in August

TWO tablets of soap for the price of one! Free plastic cup with each packet of soap powder! 3d off tins of peas! In these days of bargain basements, supermarkets, loss leaders and high pressure sales, we search for the bargains and the extra value for our money. The seeking of value for money is not confined to the domestic front for from 24th to 27th August, at the Bingley Hall, Birmingham, the **MIDLAND AQUARIUM AND POOL SOCIETY** is offering the Show Bargains of the Year—three aquarium shows for the price of one! Here surely is something never offered before—51 open classes covering every species of tropical fish, each variety of fancy goldfish, many novice classes, an A.V. pond or river fish class, a plant class and a society decorative tableau class. The last-named for valuable cash awards. Also trade stands, aquatic film shows, talks and displays, bar and buffet and ample parking space.

Added to this, and at no extra charge, will be the **BRITISH KILLIFISH ASSOCIATION'S** First International Killifish Show, with 19 classes covering the entire

beautiful range of these aquatic gems. Entries for this have been promised from U.S.A., Canada and Ireland. PLUS, and last but certainly not least, the **FEDERATION OF GUPPY BREEDERS' SOCIETIES** Midland Open Guppy Show, with 26 classes covering each and every variety of the colourful, active and well-loved guppy.

There are 96 full classes in all, for the bargain admission price of 2s adults and 1s children. Nothing further to spend unless you want a copy of the souvenir show programme, 64 pages at 1s per copy. Included with the programme is a free chance for the lucky programme draw, for three valuable prizes. Well-known traders in the Hall will be stocking the very latest in equipment, fishes and plants. The bar and buffet will be open throughout the four days of the show and members of the many Associations represented will be happy to answer questions and advise you on aquatic problems.

Further details may be obtained from me—Mr J. Edwards, show secretary, 34, Veronica Close, Selly Oak, Birmingham 29.

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Dates for your Diary

1st and 2nd July. **PETERLEE & D. A.S.** Fifth Annual Open Show in the Eden Hill Community Centre, Eden Lane, Peterlee, Co. Durham. Further details from show secretary Mr F. Harrison, Nairobi House, Broomhill, Hutton-le-Hole, Co. Durham.

2nd July. **BRACKNELL & D. A.S.** Open show at Victoria Hall, Bracknell, Berks.

9th July. **FEDERATION OF GUPPY BREEDERS' SOCIETIES** (South Wales Branch) Annual Show at the Shaftesbury Street Methodist Church Hall, Newport. Further details from show secretary Mrs E. Steer, 160 Inverness Place, Cardiff.

9th July. **BASINGSTOKE & D. A.S.** Annual Show, Carnival Hall, Basingstoke (held in conjunction with Basingstoke Carnival Week). Show schedules from Mr B. Taylor, 45 Baird Avenue, Basingstoke, Hants.

9th and 10th July. **ROMFORD & BEACONTREE A.S.** Dagenham Town Show. Show secretary: Mr J. M. R. Fyne, 3 Ashvale Drive, Cranham, Upminster, Essex.

10th July. **BARRY A.S.** Annual Show (entries from members only). Further details from show secretary, Mrs E. Steer, 160 Inverness Place, Cardiff.

6-13th August. **PORTSMOUTH A.S.** Open Show at Portsmouth Community Centre, Twyford Avenue, Stanshaw, Portsmouth. Open to public 8-13th inclusive. Benching 6th August; judging on 7th; prizegiving and breakdown evening 13th. Further details from show secretary Mr W. T. Ryder, 493 Commercial Road, Portsmouth, Hants.

14th August. **GORTON & OPEN-SHAW A.S.** Second Annual Open Show at the Conservative Club, Gorton Lane, Manchester 18. Benching 12.00-2.0 p.m. Judging 2.15 p.m. All enquiries to Mr Len McCourt, 36 Railway Street, Gorton, Manchester 18.

24-27th August. **MIDLAND OPEN AQUATIC SHOW and TRADE EXHIBITION** at Bingley Hall, Broad Street, Birmingham 1. This year 51 open classes are being featured and in addition the British Killifish Show and the Midland Open Guppy Show are all being staged together for a single admission charge of 2s. Details from secretary of the Midland Aquatic Show Committee, Mr J. Edwards, 34 Veronica Close, Selly Oak, Birmingham 29.

27th August. **HOUNSLOW & D. A.S.** Open Show at Chatsworth School, Heath Road, Hounslow, Middlesex. Show schedules from Mr R. Scurry, 36 Argyle Avenue, Hounslow.

3rd September. **HIGH WYCOMBE & D. A.S.** Open Show at the Rye, High Wycombe, Bucks. Schedules from show secretary Mrs V. Pike, 16 Ashley Drive, Tylers Green, Penn, Bucks.

3rd September. **FEDERATION OF BRITISH AQUATIC SOCIETIES** Assembly.

3rd and 4th September. **NOTTINGHAM & D. A.S.** Third National Fish Show at the Drill Hall, Derby Road, Nottingham. Show secretary: Mr W. J. Christian, 40 Moor Lane, Bunny, Notts.

4th September. September Convention of the **FEDERATION OF SCOTTISH AQUARIST SOCIETIES** at The Good Templar Hall,

Gray Street, Broughy Ferry, Angus. Host Club: **DUNDEE A.S.**

11th September. **HUDDERSFIELD TROPICAL FISH SOCIETY** Open Show at the Friendly and Trade Societies Club, Northumberland Street, Huddersfield. Further details from Mr L. Kaye, 6 Totties, Holmfirth, Huddersfield.

17th September. **NEWPORT A.S.** Fourth Annual Open Show at the Drill Hall, Snow Hill, Newport. Classes (26) include two for marine fish. Show secretary: Mr M. J. Parry, 45 Western Drive, Gabalfa, Cardiff.

18th September. **GARFORTH & D. A.S.** Open Show at Church Hall, Church Lane, Garforth, Leeds. Benching 1.00-2.30 p.m. Further details from Mr R. A. Clarke, 66 Derwent Avenue, Garforth, Leeds.

2nd October. **HEYWOOD & D. A.S.** Open Table Show. Details awaited.

16th October. **STONE A.S.** Second Open Table Show. Further details from show secretary Mr K. J. Harvey, 61 St. Vincent Road, Walton, Stone, Staffs.

29th and 30th October. **BRITISH AQUARISTS FESTIVAL** at Belle Vue, Manchester. Enquiries to show secretary: Mr G. W. Cooke, Spring Grove, Field Hill, Batley, Yorks.

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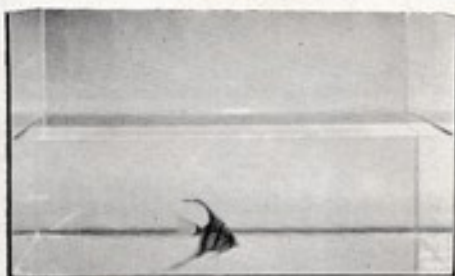
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